

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

Tokyo, Japan, 1981 March 13

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REPORT OF THE SCIENTIFIC SUB-COMMITTEE OF THE  
AD HOC COMMITTEE ON MARINE MAMMALS

The Scientific Sub-Committee of the Ad Hoc Committee on Marine Mammals met March 10 to 13, 1981 in Tokyo, Japan. C.R. Forrester convened the meeting. Commissioner Hiroya Sano of Japan welcomed participants and made brief opening remarks.

The sub-committee submits the following report to the Ad Hoc Committee on Marine Mammals.

1. PARTICIPANTS. Individuals participating in the meeting are listed in Appendix 1.
2. SELECTION OF CHAIRMAN. K. Takagi of Japan was selected as chairman.
3. SELECTION OF RAPPORTEUR. The Secretariat kept the record and prepared a draft report for consideration by the sub-committee.
4. AGENDA. The scientific sub-committee adopted the following agenda for its sessions:
  - (a) Opening remarks
  - (b) Introduction of members and advisers
  - (c) Election of chairman
  - (d) Appointment of rapporteur
  - (e) Adoption of Agenda
  - (f) Review of terms of reference
  - (g) Review of documents
  - (h) Review of research activities in 1980 season
    - i. On Japanese research vessels
    - ii. On Japanese motherships
    - iii. On U.S. Platforms of Opportunity Program vessels
    - iv. Acoustic studies
    - v. Others

- (i) Review of research program
  - i. Abundance studies
    - (1) Incidental catch data
    - (2) Sighting survey
  - ii. Biological studies
  - iii. Acoustic studies
  - iv. Behavioral studies
  - v. Field trials of proposed gear modification or technique
  - vi. Others
- (j) Research plan in 1981 season
- (k) Procedures for producing a report on the marine mammal studies
- (l) Future meetings or consultations
- (m) Consideration of a report to the ad hoc committee

5. REVIEW OF TERMS OF REFERENCE. The terms of reference assigned in 1979 and used by the sub-committee are as follows:

- a. Coordinate and review studies with respect to marine mammals incidentally caught in the Convention area when fishing for anadromous species, as per Article X of the Convention, paragraph 1(c) of the Annex to the Convention, and the Memorandum of Understanding regarding Dall's porpoises signed by representatives of the Governments of Japan and the United States in Tokyo on April 25, 1978
- b. Prepare a report annually for consideration by the Ad Hoc Committee on Marine Mammals on the above matters

At its 1980 meeting the Ad Hoc Committee on Marine Mammals agreed that at the meeting of the sub-committee to be held in Tokyo in March 1981, the sub-committee would review past research, plan and coordinate research for 1981, and consider procedures for producing a report on the marine mammal studies.

6. REVIEW OF DOCUMENTS. The following documents were studied by the sub-committee: Docs. 2370, 2371, 2380, 2381, 2386, 2387, 2388 and 2389. Titles of these documents appear in Appendix 2. The sub-committee also had for reference Docs. 2378 (Salmon catch statistics for Japanese mothership and landbased fisheries, 1980) and 2385 (Report of the Ad Hoc Salmon Research Coordinating Group).

## 7. REVIEW OF RESEARCH ACTIVITIES IN 1980 SEASON

When introducing this agenda item, the chairman of the sub-committee noted that discussion would probably overlap with discussion of items in agenda item 8 (REVIEW OF RESEARCH PROGRAM). Under this agenda item - Research Activities - both the United States and Japan reported on the various research activities noted as sub-sections of this agenda item.

Dr. Jones in updating and summarizing United States research activities described in Doc. 2371, which had been submitted at the time of the 1980 Annual Meeting, noted that sampling procedures in 1980 had been greatly improved from those in 1979 because of the full cooperation of Japanese workers. The 1980 data collected on marine mammal sightings were undergoing final quality control procedures and a computer tape of all material would soon be ready.

Activities of U.S. marine mammal biologists aboard Japanese salmon motherships were described. Research on the dedicated vessel Hoyo maru No. 81, which included tagging of Dall's porpoise, sighting studies, etc. was also described. During tagging operations on the latter, which were best conducted with a cross bow, it was noted that Dall's porpoise generally did not approach the vessel until the vessel had slowed to 2 knots or less, or had stopped. The Hoyo maru No. 81 also operated with the commercial mothership fleet studying entanglements. Of the marine mammals entangled in the gillnets of the Hoyo maru No. 81, 5 out of 26 were released alive. The majority (73%) were entangled in the upper half of the gillnet and 19% were entangled within the last 50 m of the end of a net. Further study of the pattern of entanglement was needed. Examination of environmental data, weather conditions, etc. to date has shown no correlation between those data and rates of incidental catch of marine mammals.

Sighting studies were conducted aboard the Hoyo maru No. 81 and two Japanese salmon research vessels. The total number of Dall's porpoise sighted during three cruises was 2,738 individuals in 592 sightings. During five cruises of U.S. Platform of Opportunity Program vessels a total of 360 porpoises was sighted (in 53 sightings). In addition, there was one sighting of several thousand Dall's porpoise reported in March in Stephens Passage in southeast Alaska. This is the largest sighting of Dall's porpoise reported to date.

Biological samples were collected primarily by U.S. biologists aboard Japanese motherships (929 Dall's porpoise). Samples are being analyzed to determine the life history parameters and food habits of the Dall's porpoise.

Japan updated and summarized research activities on marine mammals, a portion of which had been reported at the 1980 Annual Meeting (Doc. 2370). Dall's porpoise caught incidentally by the Japanese landbased fishery in 1980 amounted to 139 and by the mothership fishery 1,004 (999 dalli type porpoise, one truei type, and 4 harbor porpoises) (INPFC Doc. 2380). Sixty-four porpoises (56 dalli, 1 truei, 1 harbor, three northern right whale dolphins, and 3 unidentified porpoise) were caught incidentally in 31 experimental operations of research vessels using a total of 38,030 tans of gear.

A computer tape of Japan's marine mammal sighting surveys in 1980 has been transmitted to the United States. This tape contains all final and corrected data provided by Japan for Doc. 2370. Japan noted the high incidental catch recorded by observers aboard the dedicated vessel, the Hoyo maru No. 81, and suggested that there might be some association of Dall's porpoise with the unusually high abundance observed in 1980 of a prey species, Atka mackerel. This association had not been validated statistically. Japan expressed a keen interest in United States analyses of Dall's porpoise stomach contents which was not yet complete for stomachs collected aboard the dedicated vessel in 1980. However, the United States did point out the analysis to date had not shown anything but rare occurrences of Atka mackerel in stomachs at the time of year sampled.

The United States noted that most of the incidental catch of Dall's porpoise taken by the landbased fishery were from the northern area of fishing and CPUE was unusually high in area 5542. No apparent reasons for these situations were known.

Some discussion took place on the question of incidental catch of marine mammals by various mesh sizes. Japan noted that catch per set, as opposed to catch per tan, was established only recently but that catch per mesh size data for 1979 had been provided the Secretariat in a salmon research document and to the United States on magnetic tape.

The 1980 catch data for salmon research vessels would be forwarded to the Secretariat in April 1981. Japan also agreed to provide data on the numbers of Dall's porpoise released alive by species from those caught incidentally in research vessel operations as recorded in Doc. 2381.

## 8. REVIEW OF RESEARCH PROGRAM

(a) Abundance studies. Japan reported that estimates of Dall's porpoise abundance prepared by Japan for 1978, 1979 and 1980 were contained in INPFC Docs. 2150, 2266 and 2386. The latter document was submitted to this meeting and contents were summarized by Japan.

Nine Japanese research vessels (including the Hoyo maru No. 81) participated in sighting research on marine mammals in the area of the northern part of the North Pacific Ocean, Bering Sea, and Gulf of Alaska during the period April through August, 1981. The area was extended eastward to 135°W in 1980 compared with an eastward limit of 150°W in previous years. The format for recording data while sighting differed only slightly from that in 1978 and 1979. The total distance navigated in marine mammal sightings was 44,744 miles (larger by 8,239 nautical miles and 1,775 nautical miles respectively for 1978 and 1979). Most observations were made from the vessel bridge. Thirteen cetacean and 2 pinniped species were identified. Dall's porpoise (principally dalli type) were the predominant species sighted. Northern fur seals represented 4.5% of sighted marine mammals. The density of Dall's porpoise observed in 1980 was highest in June, but for the three years (1978-80) combined it was highest in August, with near August levels of abundance observed in June and July. The largest school sizes encountered in 1980 consisted of 24 individuals and average school size was 4.2, with a mode of 2 individuals. The greatest distance from the vessels that Dall's porpoise could be observed in 1980 was 1,000 m.

The Japanese method for estimating population sizes of Dall's porpoise in 1980 was by analyzing the sighting data using the Doi (1974) method, as was done in 1978 and 1979. The parameters for the formula used when estimating abundance in 1980 and making revised estimates of abundance for 1978 and 1979 using the larger research area in 1980 are found in INPFC Doc. 2386. The same methodology was used for estimating populations of northern fur seals.

On the assumption that the same densities of marine mammals as observed in the research area may be found in the total area of the North Pacific north of 40°N, the Sea of Okhotsk and the Bering Sea where the species are distributed, the total estimated abundance of Dall's porpoise would be 5.6 million individuals (based on consolidated data for 1978-80). The estimated population for northern fur seals was 370,000 individuals. The total population of northern fur seals in the North Pacific, Bering Sea and Sea of Okhotsk has been estimated by others at 1.7 million individuals. At the time the marine mammal survey is made most fur seals are breeding on land and the abundance in the water would be less than half the total population. The estimated value for fur seals is fairly close to that value which suggests the methodology may be appropriate and if so, the population estimate derived for Dall's porpoise from the same methodology can be considered to be fairly close to the true population.

The United States in refuting the Japanese estimate of population size noted that the Japanese methodology did not appear to be appropriate for Dall's porpoise. United States estimates of abundance based on the

sighting surveys conducted in 1978 and 1979 on Japanese salmon research vessels and on Platform of Opportunity Program vessels and using strip and line transect models were substantially lower. The methodology is described in INPFC Doc. 2388. The strip censuses yielded estimates ranging from 837,000 to 1.8 million Dall's porpoise in the northern North Pacific and Bering Sea. The line transect analysis yielded estimates for 1978 and 1979 abundance of 920,000 and 2.327 million respectively. While the United States scientists recognized certain limitations to their methodology they believe that the best estimate of total population is that for 1978 data of 920,000 individuals. The United States also noted that this best estimate might be biased through attraction of Dall's porpoise to the survey vessels by as much as + 60% and actual abundance might be 575,000 animals. The United States hopes to plan for coordinated vessel and helicopter operations which may shed light on Dall's porpoise behavior and assist in measuring abundance. The United States also reported that the estimate of abundance for 1980 would be complete in about 2 weeks, and that computer tapes are available on request for the strip and line transect analyses.

(b) Biological studies. The United States reported that there were several apparent biases in the biological material being studied. These included: the incomplete and possibly non-random samples of Dall's porpoise returned to the motherships for examination; sampling was conducted during a short two month period each year and thus there was no information on gestation period, lactating period etc; sampling was being conducted in a very limited area of the total distribution and there is possible segregation of portions of the population. It was believed that there was over-representation of pregnant females and under-representation of sexually mature males.

A preliminary analysis of 1980 samples showed an increased percentage of lactating females in late July which suggested animals were giving birth in the area. New-born animals were also present in highest numbers in late July. Some problems in the age determinations from teeth were reported. In general, however, the United States analysis to date suggests the Dall's porpoise is characterized by a short life span (less than 10-13 years generally), an early age of reproduction (4-5 years in males and females), a high reproductive rate (90% or more of the mature females pregnant), and an annual reproductive cycle with calving occurring from late June to at least late July. The similarity of the present data and those obtained in 1964, after eleven years of intensive fishing effort with high levels of estimated incidental take, indicates that the porpoise population has apparently existed as characterized for some time. Taking the data at face value, this life history pattern could be symptomatic of a population responding to sustained large removals.

Japan expressed some disagreement with United States estimates of gross annual reproductive rates (GARR) on the basis of the small samples involved in the estimate and did not believe that the high estimates of GARR were symptomatic of increased exploitation. Japan noted that the incidental take of Dall's porpoises is low compared to the total population. Both Japan and the United States agreed that more study of mortality and reproductive rates was required in the area of the sampling and in other areas.

United States studies on food of Dall's porpoise showed that stomachs examined were an average of 47% full. However, it was also noticed that some regurgitation occurred when the animals were being recovered aboard the dedicated vessel. The most common species found in stomachs were lantern fish and squid. Fish species consumed by Dall's porpoise ranged from 20 to 480 mm in length (average 86 mm). Based on reports in the literature and analysis of some salmon stomachs prey items of salmon ranged in length from 10 to 150 mm.

The United States noted the need for samples of Dall's porpoise from the landbased fishery area to determine if animals in this region were part of a common stock or were a separate stock. Japan noted that Dall's porpoise carcasses had been collected from the landbased area but the quality of the specimens was uncertain. Japan stated that collection of biological material from Dall's porpoise in the area would continue as opportunity permits. Japan also noted the difficulty of instructing fishermen in the requirements of biologists but said the educational process would continue.

#### 9. RESEARCH PLAN IN 1981 SEASON

Japan outlined plans for continuing studies on means of estimating Dall's porpoise abundance, determining population size and refining estimates of incidental catch, noting that there were differences in estimation of these factors by Japan and the United States.

Japan also outlined plans to initiate research on changes in fishing gear to reduce or avoid the incidental catch of marine mammals in commercial fishing operations. These included use of hollow tubing in 330 tans of gear used by three catcher boats of each of the four mothership fleets and possible field trials of electrical and mechanical acoustic signals to give porpoises an earlier warning of the presence of the net. Incidental catches with the modified gear would be compared with those from standard fishing gear.

The United States expressed pleasure on learning that Japan planned to continue the usual research and was initiating studies of Dall's porpoise incidentally taken by the landbased fishery and gear modifications

designed to reduce the incidental catch of Dall's porpoise in 1981.

United States recommendations for continued research as detailed in INPFC Doc. 2389 were described. Prior to summarizing the recommendations the United States member noted that analysis of the data obtained during the three-year cooperative study indicates the impact on the porpoise populations cannot be determined with certainty at this time. There are biases in the life history data and in the estimates of abundance and further research is necessary. The studies with the highest priority include accurate estimation of the incidental take in various regions of the fisheries' areas, verification of the accuracy of the estimates of the biological parameters of Dall's porpoise, identification of possible separate stocks of Dall's porpoise, and refinement of population estimates, particularly by obtaining data on attraction of porpoise to survey vessels.

The proposed studies include monitoring the incidental take aboard the commercial catcherboats, repeating the dedicated vessel studies and initiating, where possible, sampling of the incidental take of marine mammals in the landbased fishery. Japan stated it would consider all proposals seriously.

A small working group of the sub-committee met to consider details of the United States recommendations contained in INPFC Doc. 2389. In this working group Japan made the following proposal as a feasible research program for monitoring the incidental take of marine mammals in mothership fishing operations in 1981.

- 1) to add one scientific observer per fleet for boarding catcherboats to the present number of two scientific observers per fleet (one observer for salmon, one biologist for marine mammals) within the U.S. F.C.Z.
- 2) to permit the marine mammal biologists on board the motherships to board catcher boats temporarily inside the U.S. F.C.Z. to record incidental take data and to strengthen the cooperation from Japanese crews for the sampling work of the biologists especially while the biologists are aboard the catcherboats.
- 3) to have one Japanese observer per mothership fleet, selected by the Japanese government aboard catcherboats to record incidental take data throughout the fishing season and area (including outside the U.S. Fishery Conservation Zone).

It was agreed to finalize certain details of these proposals through correspondence.

10. PROCEDURES FOR PRODUCING A REPORT ON THE MARINE MAMMAL STUDIES

The sub-committee agreed that Japan and the United States would each prepare comprehensive reports on the data derived from the 1978-80 marine mammal research for presentation to the Ad Hoc Committee on Marine Mammals at the 1981 Annual Meeting.

11. FUTURE MEETINGS

The sub-committee RECOMMENDS that a meeting of the sub-committee be held in Tokyo, Japan, during February or March in 1982.

APPENDIX 1  
(Doc. 2390)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

Tokyo, Japan, 1981 March 13

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PARTICIPANTS. The following persons took part in the sub-committee's sessions:

CANADA	Member	L. Margolis	Pacific Biological Station
UNITED STATES	Member	L. Jones	National Marine Mammal Laboratory, NMFS
JAPAN	Member	Osamu Sano	Far Seas Fisheries-Research Laboratory
	Advisers	Seiji Ohsumi	Far Seas Fisheries-Research Laboratory
		Kenji Takagi	"
		Mamoru Kato	"
		Yoshimi Hatakeyama	National Research Institute of Fisheries Engineering
		Kenzo Kawakami	Special Adviser, MOFA
		Toshio Isogai	Fishery Division, MOFA
		Takashi Shinomiya	"
		Yasuo Takase	"
		Yoshiaki Ito	"
		Mitsuyoshi Murakami	International Affairs Division, JFA
		Masanori Miyahara	"
		Manzo Tachibana	"
		Kineo Kobayashi	"
		Shuichi Takehama	Research Division, JFA
		Teruaki Kosaka	Resources Division, JFA
		Ryoji Koseki	"
		Toshitaka Suzuki	"
		Takeji Fujii	Professor, Hokkaido University
		Nobuyuki Miyazaki	National Science Museum, Tokyo
	Observers	Daihachi Misawa	Japan Salmon Gillnet Fisheries Cooperative Association
		Masayoshi Narita	"
		Sannosuke Sato	Northern Sea Salmon Mothership Council

Yoshishige Shibuya	Fleet Commander, <u>Nojima maru</u>
Toshihiro Yoshimura	" <u>Kizan maru</u>
Kiichi Tomura	" <u>Jinyo maru</u>
Retsuzo Nagayama	<u>Meiyo maru</u>
Toshio Hidaka	Assistant Fleet Commander, <u>Meiyo maru</u>
Kohichi Funano	"
Jun Kumagai	Assistant Fleet Commander, <u>Nojima maru</u>
Takahiro Ohtsuki	Fishing Master, <u>Nojima maru</u>
Takayuki Tanaka	" <u>Kizan maru</u>
Junroku Ogasawara	Kushiro Fisheries Experimental Station

SECRETARIAT	C.R. Forrester	INPFC
	Toshie Kawamoto	(Inter-Group)

INTERPRETERS	Kuniko Shirae	(Inter-Group)
	Mayuri Hirata	"

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DOCUMENTS. The following documents were reviewed by the Scientific Sub-Committee of the Ad Hoc Committee on Marine Mammals, Tokyo, March 10-13, 1981

<u>Doc. no. &amp; origin</u>	<u>Title, author, date, etc.</u>
2370 (Japan)	Outline of research on marine mammals including Dall's porpoises incidentally caught by salmon gillnets which was conducted in 1980 by Japan. Fishery Agency of Japan, 1980 October 31.
2371 (U.S.)	Progress report on Dall's porpoise research, 1980. National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center, Seattle, 1980 October.
2380 (Japan)	Incidental catch of marine mammals by the mothership and landbased salmon gillnet fisheries of Japan by INPFC area, by 10-day period, in 1980. Fisheries Agency of Japan, 1981 January.
2381 (Japan)	Catch statistics of salmon and marine mammals caught in gillnets of Japanese salmon research vessels by 2°x5° area and 10-day periods, 1980. Fisheries Agency of Japan, 1981 January.
2386 (Japan)	Report on abundance survey of marine mammals, mainly Dall porpoise, by Japanese salmon research vessels in the North Pacific Ocean in 1980. Fisheries Agency of Japan, 1981 March.
2387 (U.S.)	Report on studies of the incidental take of marine mammals particularly Dall's porpoise, <u>Phocoenoides dalli</u> , in the Japanese salmon fishery. National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center, N.M.F.S. Seattle, 1981 January.

- 2388 (U.S.) Estimation of the abundance of Dall's porpoise (Phocoenoides dalli) in the North Pacific Ocean and Bering Sea.  
G.Christopher Bouchet, National Marine Mammal Laboratory,  
Northwest and Alaska Fisheries Center, N.M.F.S., 1981 February.
- 2389 (U.S.) Recommendations for research related to the incidental  
take of marine mammals by the Japanese high seas salmon fishery.  
National Marine Mammal Laboratory, Northwest and Alaska  
Fisheries Center, N.M.F.S., 1981 March.