INPFC
Doc. 2879

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

Tokyo, Japan, 1985 March 15

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 (AHMM) met March 11 to 15, 1985 in Tokyo, Japan. Ryuichi Tanabe, Councillor of the Oceanic Fisheries Department of the Fisheries Agency of Japan and AHMM Commissioner for Japan, welcomed participants and made opening remarks.

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:

(1) Opening remarks
(2) Introduction of members and advisers
(3) Election of chairman
(4) Appointment of rapporteur
(5) Adoption of agenda
(6) Review of terms of reference
(7) Review of documents

(8) Review of research program and 1984 research activities
    (a) Incidental catch by Japanese research vessels and salmon fishery
    (b) Studies on reduction of incidental catch
        (i) Modifications to gear or techniques
        (ii) Acoustic studies
    (c) Abundance studies
        (i) Sighting survey
        (ii) Incidental catch data
    (d) Biological studies
    (e) Behavioral studies
    (f) Others
(9) Research plan in 1985 season
(10) Future meetings or consultations
(11) Consideration of report to the ad hoc committee

5. TERMS OF REFERENCE

The terms of reference as assigned by the Commission at the 1984 Annual Meeting are as follows:

(1) 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 Washington, D.C. on 1984 June 5.

(2) Prepare a report annually for consideration by the Ad Hoc Committee on Marine Mammals on the above matters.

6. REVIEW OF DOCUMENTS

The following documents were reviewed by the sub-committee: Docs. 2825, 2842, 2852, 2858, 2859, 2860, 2862, 2863, 2864, 2866, 2869, 2871, 2872, 2873, 2874, 2875, 2876, 2877, and 2878.

Titles of these documents appear in Appendix 2.

7. REVIEW OF RESEARCH PROGRAM AND 1984 RESEARCH ACTIVITIES

(1) Incidental catch by Japanese research vessels and salmon fishery

The incidental catch of marine mammals in 1984 by Japanese operations was reviewed. In the Japanese mothership fishery a total of 2,670 Dall's porpoise and five northern fur seals were reported

taken in 8,333 operations (Doc. 2864). Of the 2,670 total, 1,304 were taken on board, 621 were released alive, and 745 were lost (Doc. 2873). In the Japanese landbased salmon driftnet fishery, 813 Dall's porpoise and one northern right whale dolphin were reported incidentally caught (Doc. 2864). Japanese research vessels in 1984 took an incidental catch of 39 Dall's porpoise, six northern fur seals, one ringed seal, one Pacific white-sided dolphin, and three saddleback dolphins (Doc. 2872).

Information on incidental catch in the research vessel operations was presented in Doc. 2872 in considerably greater detail than in previous years. Catch by station, by vessel, and mesh size was provided. The United States noted the value of the detailed information provided.

(2) Studies on reduction of incidental catch

(a) Modifications to gear or technique

The 1984 testing by Japan of fishing gears to prevent the incidental take of Dall's porpoise was outlined (Doc. 2873). In the total mothership fleet of 172 catcher vessels in 1984, 44 were equipped with air-tube thread gillnets and 12 were equipped with sound generators, i.e. approximately 33% of the fleet used gear designed to reduce the incidental take. In comparisons of entanglement in air-tube and standard gillnets, analysis showed lower entanglement in the modified gear, but opinions varied regarding the significance of the difference. The United States suggested that the experimental design of the comparative experiment might be improved to enhance the statistical analysis of the results. Japan stated that there is a certain limit in fixing the design for the experiment in advance since the present experiment has been conducted in commercial fishing activities, and considers that the results of the study are valid considering the large size of the experiment and application of statistical methods. There will be correspondence regarding the experimental design and methodology of analysis.

In experiments using sound generators emitting frequencies of 9 kHz, 145 kHz simple mode, and 145 kHz porpoise mode, the porpoise mode appeared somewhat more effective in reducing rate of entanglement. However, data are still considered to be insufficient and further trials are planned.

Both the United States and Japan, while acknowledging the progress made in this research, recognized that further studies of gear modifications are necessary to reduce incidental take levels.

(b) Acoustic studies

Acoustic studies on Dall's porpoise by Japan were presented in Docs. 2858, 2859, and 2860. Measurements of directivity of supersonic wave reflection from elements of the salmon gillnets showed a great decrease in reflection with increase in angle of supersonic waves directed towards targets. From the strong reflection shown by floats, leads, and ropes in the net, it is apparent that porpoise may first recognize the existence of the whole net and with closer approach recognize the position of certain materials. It is planned to measure the target strength of the whole net.

Attempts to record vocalizations of Dall's porpoise were made difficult because of a high signal-noise ratio while the vessel is cruising and the avoidance of the vessel by the porpoises when the vessel was slowed or stopped (Doc. 2859). However, some recordings showed low frequency clicks of 29 kHz. Records of vocalizations of Pacific white-sided dolphins were also made. These range from 39 to 131 kHz with minimum and maximum sound pressures of 41 dB and 51 dB, respectively.

Japan indicated that experiments on the Okhotsk coast of Hokkaido in 1984 with two chartered vessels showed low frequency pulses of 24 kHz and 50 kHz were effective in alerting porpoise. Best results were obtained using false clicks of 20 to 50 kHz which were effective at distances as great as 700 m with sound pressure as low as 18 dB. Random generation of waves also appeared to be more effective than regular sound generation.

As part of these studies, observations were also made in the Bering Sea of responses of porpoise to randomly generated false echolocation clicks of 20 to 50 kHz. In some instances porpoises which had previously rode the bow wave were observed to avoid the beams subsequently emitted. In others, porpoises swam across the beam but no closer to the vessel than 20 to 30 m and did not show the avoidance behavior observed in the first instance.

Estimated swimming speed of the porpoises was 3 m/sec. During other observations it was noted that porpoises frequently appeared around the bow when no signals were generated but disappeared after start of sound emission. During still other observations porpoises were observed inside the beam but when inside made quick turns of V or U shape and made sudden dives which were considered to be avoidance behavior. The variations in porpoise behavior in the Bering Sea could not be clearly correlated with the pattern of generated signals but it was believed that positive responses were made to randomly generated waves of 20 to 50 kHz. Plans are being made to equip one catcher boat with five generators of this type. The United States noted the difficulty in interpreting responses to generated sounds because of the difficulty in obtaining large enough sample sizes of responses and adequate controls for the experiments. Japan plans additional experiments to further clarify responses to the supersonic signals.

Studies by Japan were made of behavior of a Dall's porpoise held in captivity for a period of 11 days. However, feeding attempts were unsuccessful and the porpoise died. During captivity, tests suggested no startled behavior to low frequency sounds but when rope was placed on the water surface the porpoise appeared very aware of it and never attempted to dive under it. Caution was also exhibited to suspended nylon threads. Recognition of the threads appeared to increase with increased diameter of threads and to be by visual not acoustic means. Emission of randomly generated 20 to 50 kHz pulses resulted in increased breathing rates and swimming posture with the head above water. Normal breathing rate and swimming posture were resumed after emission ceased. Recordings made of the clicks of the captive porpoise suggest some of their sound patterns are somewhat unusual and their frequencies and sound pressures are lower than for specimens in the wild. Porpoise did not emit clicks in spite of switching off electric lights at night.

(3) Abundance studies

(a) Sighting survey

Dall's porpoise abundance as estimated by the United States from sighting surveys was reported in Doc. 2877. In that document, the United States noted that in response to Japan's suggestion that areas used by the United States could result in underestimating population size, it had used revised larger polygon areas to estimate regional abundance. Comparison of estimates for these polygons was made with estimates for previous polygons as was a comparison of abundance in sub-areas summed with that for larger polygonal areas. The Okhotsk Sea was not included in estimates since no sighting data exist for this area considered to have a separate population. Polygon construction was described.

The total area encompassed increased by 27% but resulted in estimates of abundance in 1984 which increased only 7% for the 200 m strip and did not change for the 400 m strip. The estimate for the Gulf of Alaska in 1983 was based on a small sample and, due to survey effort in a high density area, resulted in a higher 1983 total estimate.

Total estimated abundance obtained from pooled 1978-84 data using the new polygons was consistent with estimates obtained previously, i.e. a population of 1.0 to 1.5 million porpoise depending on the choice of strip width.

Further analysis of the shipboard attraction experiment and computer simulations to be performed, along with re-evaluation of the line transect model and incorporation of information from the population identification work, may enable improvement of the estimates.

Japan requested the United States to provide calculations of the frequency distributions of perpendicular distance of Dall's porpoise sighted used in the strip transect method. The United States agreed to provide the calculations.

Dall's porpoise abundance as estimated by Japan from sighting surveys in 1984 was reported in Doc. 2863. That document contained data from salmon research vessels only. Ten Japanese vessels were used in the survey which was conducted in the northwestern Pacific (all vessels), the Bering Sea (three vessels), and the northeastern Pacific (one vessel) from April to August. The total distance cruised was 46,682 nautical miles in the total of 566 survey days.

Of the Dall's porpoise sighted (2,436), 93.5% were dalli type, 3.3% were truei, and 3.2% were unidentified as to type. The average number of dalli type was 3.9 individuals in 585 schools and of truei type was 4.5 in 18 schools. Areas with relatively high density of Dall's porpoise were in the northwestern Pacific north of 44°N in May and in the Bering Sea and northwestern Pacific Ocean between 40°N and 44°N in June. In the northwestern Pacific between 175°E and 175°W, relatively high density was also observed in May while the density in the same areas became very low in June. This suggests that the distribution of Dall's porpoise greatly changed from May to June. Broadest distribution of Dall's porpoise in the survey area was observed in June and July. Areas with high density were observed in the northwestern Pacific between 40°N and 44°N and 155°E and 175°E and between 46°N and 52°N and 165°E and 170°E, in the Bering Sea between 52°N and 58°N, 180° and 170°W, and in the northeastern Pacific between 44°N and 54°N and 160°W and 150°W. Although the spatio temporal distribution of Dall's porpoise in the northeastern Pacific is not clear because of insufficient sighting effort, the data suggest areas of high density in both the eastern and western parts of the North Pacific Ocean.

Total abundance in 1984 estimated by Japan for the area north of 40°N using the Fourier series estimator was 1,206,000 (95% confidence limits: 0-2,462,000): 423,000 in the northwestern Pacific, 572,000 in the northeastern Pacific, and 211,000 in the Bering Sea. Abundance estimated was lower than that estimated for 1980 to 1983 (1,500,000 to 2,300,000 individuals) and similar to estimates for 1978 and 1979. Abundance estimated by the negative exponential model was 1,440,000 individuals (95% confidence limits: 0-2,923,000): 490,000 in the northwestern Pacific, 693,000 in the northeastern Pacific, and 258,000 in the Bering Sea. The estimated total was 500,000 to 1,000,000 individuals lower than estimated for 1980 to 1983. Japan believed that the apparent changes in total estimated abundance were not realistic considering the relatively long life span of the species and noted that U.S. estimates also showed differences between 1983 and 1984.

(b) Incidental catch data

No estimates of abundance were made by Japan or the United States from incidental catch data. It was recognized that the incidental catch is taken from a small part of the total area of distribution of porpoise and distribution in the sampled area is not necessarily representative of the overall distribution. For this reason it is difficult to extrapolate such incidental catch data to obtain an estimate of total population size.

(4) Biological studies

Japan summarized research done aboard the dedicated vessel (Hoyo maru No. 53) in 1984 as outlined in Doc. 2862. Objectives of studies on life history of Dall's porpoise were to (1) collect information before the breeding season, (2) determine if there was a segregation by sex and maturity in May-June as noted for August-September, (3) compare harpoon samples taken with samples taken in salmon gillnets in the same season and area, and (4) clarify areas of distribution of the dalli and truei types and other small cetaceans.

The survey was conducted in the western North Pacific outside the 200 mile zones of the U.S.S.R. and the United States for a period of 42 days in May and June. Total distance surveyed was 3,885 nautical miles for 394 hours. Species sighted were Dall's porpoise (1,871 individuals in 351 schools), eight species of whales, Pacific white-sided dolphins, northern right whale dolphins, and northern fur seals. The Pacific white-sided dolphins and northern right whale dolphins were sighted between 35°N and 39°N and 162°E and 176°E in areas south of Dall's porpoise distribution.

Of the 1,871 Dall's porpoise sighted, 875 or 46.8% were dalli type, 322 or 17.2% were truei, and identity of 674 or 36.0% was not confirmed. Sixty-six percent of identified schools were dalli, 26.6% were truei, and 7.4% were mixed.

Comparison of surface water temperature and distribution suggested that the temperature in the main area of distribution for truei type is somewhat higher than for dalli type. Porpoise school size ranged from 1 to 29 with schools of 2 to 4 individuals comprising about half the total. Areas of high density were observed for dalli type between 37°N and 42°N, 162°E and 176°E and for truei type off Cape Erimo, Hokkaido and east of the U.S.S.R. fishery conservation zone. Of the 322 schools primarily sighted, 54% approached the vessel alongside or rode the bow wave, 6.5% approached then showed avoidance, and 39.5% avoided the vessel. The areas where porpoise were likely to approach the vessels were those of high density. All truei type were sighted in areas south of 45°N with the main area of distribution west of 155°E, while main areas for dalli type were east of 155°E north of 36°N. All truei sighted east of 155°E were in schools of dalli types.

A total of 218 individuals were captured: 187 Dall's porpoise, 21 Pacific white-sided dolphins, and ten northern right whale dolphins. Of the dalli type, none were less than 150 cm in length. Males ranged in length from 153 cm to 220 cm and females from 150 to 195 cm. In dalli types, the mode for males was 15 to 20 cm greater than for females.

Males constituted the major portion (79%) of the Dall's porpoise taken, reflecting the preponderance of samples from south of 40°N. Based on testis weight, 62.8% of male dalli taken were mature as were 60.0% of truei. These percentages are considerably higher than for dalli specimens taken by gillnets in the same season and area (11.1%) and by harpoon during August and September (48.3%) and for truei specimens taken by harpoon off Sanriku in winter (16.7%).

Pregnancy rate was about 70% (n=39) and average fetus length was 78 cm. No lactating females were captured.

Schools sighted were classified into four groups: "juvenile schools" consisting of immature porpoise, "adult male schools" consisting of matured males, "mating schools" formed of estrus females and mature males, and "non-mating schools" consisting mainly of non-estrus females. All juvenile schools (of seven to 13 individuals) consisted of entirely or mainly either males or females. Schools of adult males (two to 29 individuals) were dominant in the research area. Mating schools, which included four mother and calf pairs and mature males, were comprised of six to 26 individuals and it was believed that the calves (from their body length) would soon leave the schools. The two non-mating schools consisted of four and eight individuals. A clear segregation of schools was observed; many adult male schools were distributed in areas south of 40°N while juvenile schools were found mainly north of 40°N. Mating schools were distributed over widespread areas where juvenile and/or adult male schools tended to be found. Distribution of non-mating schools suggests that dalli type probably give birth and nurse in high latitude areas in the western North Pacific.

For truei type Dall's porpoise only mating and adult male schools were observed and in the northern edge of their distribution in contrast to the same type dalli schools which were found in their southern area of distribution. Further research is required on distributions.

Biological studies on Dall's porpoise by United States scientists are described in Doc. 2875. Examination was made of 374 female specimens taken in 1983 aboard all motherships north of 56°N and collected aboard the Nojima maru and Meiyo maru fleets south of 56°N. Preliminary results of examination of 1984 specimens was also provided.

Females with at least one recently-ovulated follicle, corpus luteum, or corpus albicans were classified as sexually mature. In the southern areas (south of 53°N) in 1983 about 44% of all females were sexually mature and of these 97% were pregnant and/or lactating.

North of the Aleutians (53°N) in 1983, 18 to 33% of the females were mature and nearly all were pregnant and/or lactating. These are about the lowest proportion mature in these areas since sampling began in 1978; the reason for this is not known. The mean body size of females in their first pregnancy (one corpus luteum and no corpus albicans) was 175 cm south of 53°N and 183 cm in the Bering Sea in 1983. Approximately 17% of the sexually mature females from the U.S. FCZ were in their first pregnancy whereas 30% from the Bering Sea were. The smallest sexually mature female was 161 cm in 1983.

Total number of corpora in sexually mature females ranged from 0 to 18 south of 53°N and as high as eight north of 53°N in the Bering Sea in 1983. The mean number of total corpora per mature female was 4.6 in the southern U.S. FCZ and 3.5 in the Bering Sea. In the Bering Sea, 63% of the females had three corpora or less while 44% in the U.S. FCZ had three or fewer. This difference between northern and southern animals is similar to previous years. Only in 1982 with a larger sample size were more females with higher numbers of corpora found in the northern area.

In 1981, there was a decrease in the proportion of pregnant females and a corresponding increase in lactating females, with increasing numbers of ovarian corpora. However, the 1982 and 1983 samples showed only slight decrease in the proportion of pregnant females with increased corpora.

Mammary glands showed increased secretory activity in relation to fetal length in each year and for all years combined. This indicates that lactation is in response to impending parturition rather than from continued lactation from a previous calf.

Females with large fetuses rarely had Graafian follicles larger than 3.0 mm. Of lactating females, 55% had follicles larger than 3.0 mm in 1983 with 13.0 mm the maximum size. There was one animal with a recently ruptured follicle in 1983 compared to six in 1982. It was newly-matured with no corpora from earlier ovulations.

In the U.S. FCZ the earliest newborn animal was taken on June 11, 1983 and on June 25, 1984. In previous years no newborns were collected north of the Aleutian Islands. In 1983 the first newborns (125 cm) were collected in the northern area, one on June 27 at 58°N and 179°E and a second (95 cm) on July 18 at 54°N and 172°E. One newborn also was taken in the northern area in 1984 on July 17 at 55°N and 174°E. Whether there was an earlier calving period or change in porpoise distribution or fishing effort was unclear.

Length-frequency histograms of males collected in 1982-84 show variation in the abundant size classes. In 1982 and 1984 in the southern FCZ the modal size is mature males of 195 to 200 cm. In 1983 the mode is of immature males of 155 to 160 cm. Males in the Bering Sea consistently show a mode at about 160 cm with low numbers of mature males. In 1983 there was the similar preponderance of smaller females (150 to 155 cm) seen in the 1983 sample of males.

The sex ratios varied with area, time period, and maturity of the animals. South of 49°N during early June sex ratios are about equal in both the immature and mature groups. North of 49°N latitude males tended to predominate in the immature group, particularly in the Bering Sea. In mature animals, particularly south of the Aleutians, females are more numerous, by as much as 2 or 3 to 1.

During the 1981 season approximately 636 Dall's porpoise were collected and sampled in the area between 49°N and 53°N latitude. Of these animals, 166 (26%) were aged using counts of growth layers in the tooth cementum. In the Bering Sea north of 56°N only 57 animals were collected in 1981 and all but seven samples were aged.

Between 49°N and 53°N the dominant age groups were 2- to 5-year-olds. In the Bering Sea the dominant age groups among both males and females were 3- and 4-year-olds.

The length-frequency histograms by age group for animals taken between 49°N and 53°N show a general trend of increase in mean length with age. The number of ovarian corpora increases with age but there is a wide range of values.

Stomach contents of animals collected in 1978, 1979, and 1980 in the mothership fishery and in 1982 during the research cruise of the Hoyo maru No. 12 have been examined and fish and squid prey identified. Specimens taken by the Hoyo maru No. 12 showed the predominant prey to be Gonatus spp. but species identifications were not possible. In the mothership fishery area Gonatus species were again common with Gonatus borealis occurring in 62 of the 70 stomachs examined. Data on the fish species are currently being analyzed and comparisons by geographic area, sex, and age of the porpoise are to be made.

The United States reported on a study by Japanese and United States scientists to compare between-reader difference in age determination of Dall's porpoise from sectioned tooth slides. The study also included examination of effects on age determinations of methods of preparation of slides.

The analyses indicate that there is a large disagreement between readers in counting growth layers in Dall's porpoise teeth, particularly of immature animals. This causes problems in the life history analyses of Dall's porpoise and the present understanding of the early postnatal growth of the species has to be questioned. Recent studies recognized two peaks in the body length frequency at 100 and 150 cm in samples collected in the summer season and interpreted them as representing age classes 0 and 1 layer (year), respectively. The first peak (100 cm) represents newborn calves. In the present study, the other group (150 cm) was considered to represent either 1 or 2-4 layers, depending on the reader. If the latter peak really represents ages of 2-4 layers as suggested by some readers, it must be considered either that the readers counted accessory growth layers which are not annual in deposition, or that the deposition is annual and the growth of juveniles is much slower than has been considered. Comparison of the Dall's porpoise growth and reproductive pattern to other odontoceti may throw some light on this question.

If the problem in interpretation of growth layers deposited while the porpoises are about 160 cm or less in body length is resolved then a major problem of age determination will be solved. However, there would still remain the problem of the accuracy of reading layers.

To improve agreement between readers and increase the reliability of age determination the readers must meet to discuss their methods. To determine whether one method is better than the others and can be produced reliably by all the scientists, tooth specimens from a sample of animals should be exchanged, prepared, and read by each of the scientists.

The sub-committee, recognizing that analysis of much of the biological data on Dall's porpoise depends greatly on accurate age determination, RECOMMENDS:

> That a one-week workshop be convened in the early summer of 1985. At that workshop the three principal readers would examine and prepare tooth slides, attempt to resolve differences in interpretation, and work towards achieving consistency in age determination. Location and date of the workshop will be determined by correspondence. Participants will plan to provide a report on their findings at the annual meeting of the AHMM Committee in November.

(5) Behavioral studies

The United States reported on their study of responses of Dall's porpoise to survey vessels as detailed in Doc. 2874. The work was a continuation of that initiated in 1982 using a survey vessel and a helicopter. Methods were essentially the same as in previous experiments and operations were conducted in both offshore and nearshore waters. Results obtained in 1984 are not fully comparable to those previously obtained because the helicopter used was extremely noisy, easily detected by the animals, and altered their behavior in most cases. However, it was presumed from the small data base collected that porpoise offshore, like the nearshore animals, are attracted to vessels. Of animals or schools showing reaction to vessels, 66.7% were attracted and 33.3% showed avoidance in both nearshore and offshore observations.

Japan noted the desirability of additional experiments over a wider area and time period to refine the estimate of the attraction/avoidance ratio.

Four cow/calf pairs were sighted from the helicopter on June 19 and one pair from the ship on June 20. Little information on calving exists for the eastern North Pacific but calves have been observed in the western North Pacific in June. Based on the five sightings during the response survey, calving occurs in both areas at about the same time period. In addition to the Dall's porpoise, eight species of cetaceans were observed from the ship and/or helicopter.

(6) Others

There was discussion of the exchanges of data concerning Dall's porpoise which have taken place. Japan expressed appreciation to the United States for receipt of all set and retrieval data, biological data, and sighting data collected since 1978. The United States noted that age and reproduction analyses are not completed for some years but would provide Japan with data as soon as possible. The United States requested biological data for samples collected in the landbased fishery and those taken by harpoon in the cruises of dedicated vessels. Japan agreed to provide available data.

8. RESEARCH PLAN IN 1985 SEASON

The United States proposal for U.S. research in 1985 was discussed (Doc. 2876). Field research will be similar to that conducted in 1984.

Two U.S. marine mammal biologists will board catcher boats in each Japanese salmon mothership fleet to monitor both catcher vessels equipped with modified gear and boats using standard gear. Collection of sighting data will be made on Japanese catcher boats and U.S.

Platform of Opportunity Program vessels. Collections of biological specimens will continue on motherships as in the past. Acoustic studies will be made on target strength of standard and hollow tube gillnets. Recordings of Dall's porpoise vocalizations and experiments with captive dolphins (having similar acoustic signals to Dall's porpoise) in aquariums are hoped to be conducted.

Laboratory analysis will be continued on incidental take data to determine uniformity of coverage and differences in areal, seasonal, and annual patterns. Biological specimens collected in 1985 will be examined in the laboratory and work will continue on biological material collected in earlier years.

Japan reviewed the 1985 program for Japanese research vessels which is described in Doc. 2871 (also see Appendix 3 of that document). Research will include sighting surveys of Dall's porpoise conducted from vessels cruising to and from research areas, monitoring the incidental take, collection of biological samples, and retention of whole specimens when freezing capability permits for later biological study.

Japan noted its plan to have, as in previous years, a vessel dedicated to marine mammal research during the period August 6 to September 17. The vessel, the Hoyo maru No. 12, will conduct sightings over a broad area including waters within the U.S.S.R. 200 mile zone and harpoon sampling in the northwestern Pacific and the Bering Sea (Fig. 1).

Gear and acoustic studies will continue in the commercial fleet. Studies of reflectivity of gear will be continued as will studies on any live porpoise captured, if possible, and on belugas held in an aquarium. The responses of Dall's porpoise to sound, light, and net materials and net detection ability of belugas will be studied.

The Japanese industry team working on methods to reduce the incidental take noted its intention to use air-tube thread nets on 20 vessels in each fleet and modified gear with air-tube threads in the top third of the net on two vessels in each fleet, i.e. a total of 88 vessels with modified nets. Equipment generating 145 kHz simple mode signals (one vessel per fleet), 145 kHz porpoise mode signals (one vessel per fleet), and the newly designed 20 to 50 kHz signals (one catcher boat only) will also be deployed. In 1985, 97 of the 172 catcher boats will use modified gear or techniques designed to reduce the capture of Dall's porpoise.

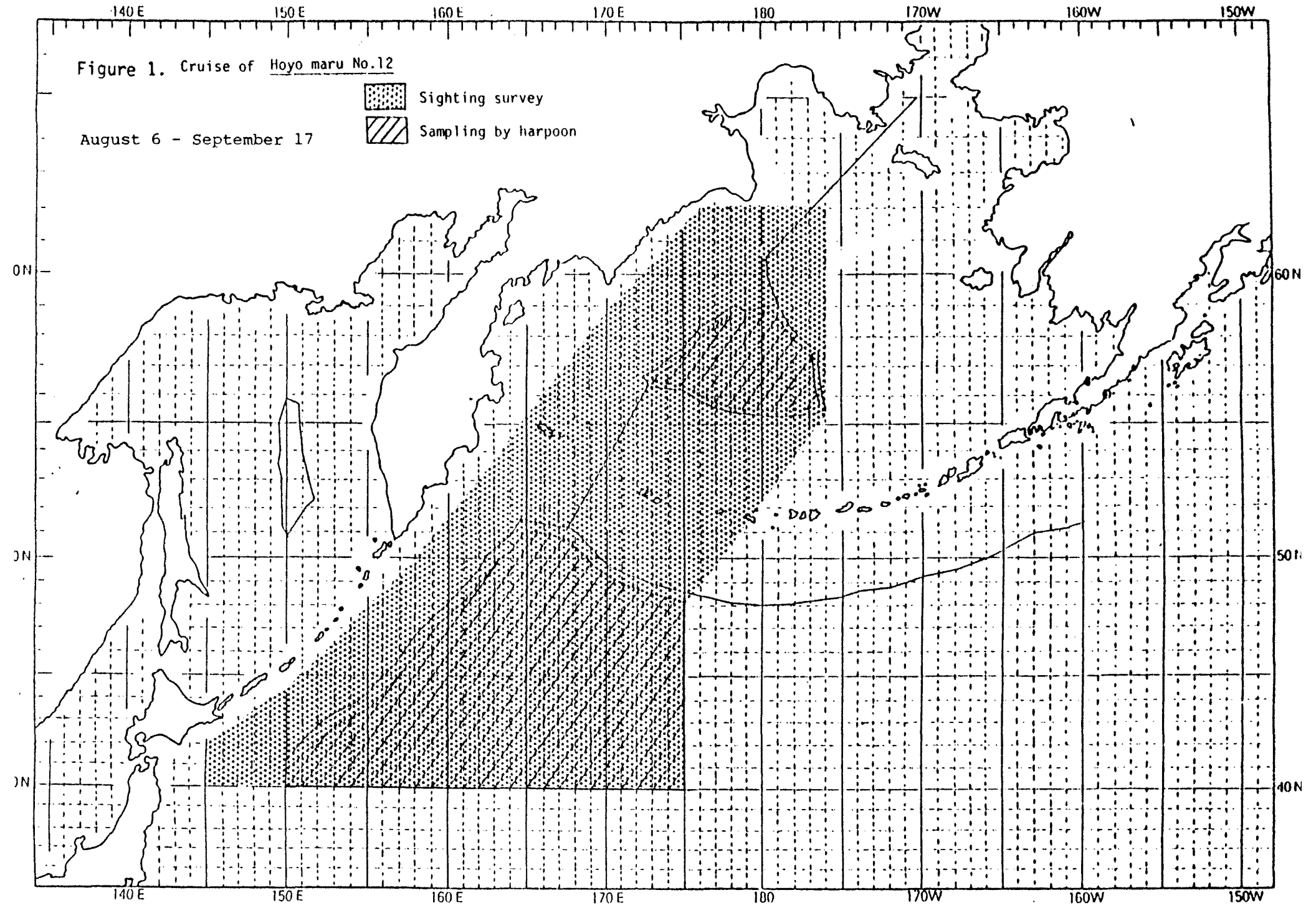
In discussion of biological sampling aboard the landbased vessels, Japan noted its intention to maintain sampling at the same level as in 1984 and despite the limited freezing capability of these vessels would endeavor to ensure that sampling was not biased.

Discussion took place on general research topics fundamental to understanding of Dall's porpoise populations. It was concluded that further research was required to determine whether or not separate stocks exist. There was discussion of models to be used in studying the population dynamics. The segregation of porpoise during certain life stages was noted. The movements of animals has been noted but patterns are not clearly defined. Several other research topics were discussed and the sub-committee agreed that further research was still required for better understanding of Dall's porpoise in the North Pacific.

9. FUTURE MEETINGS OR CONSULTATIONS

The sub-committee RECOMMENDS that it continue its research studies and meet again for scientific discussions and planning further research in Tokyo in February or March in 1986.

FIGURE 1 AND APPENDICES 1 AND 2 FOLLOW


140 E
150 E
160 E
170 E
180
170W
160W
150W
Figure 1. Cruise of Hoyo maru No.12
Sighting survey
Sampling by harpoon
August 6 - September 17
60 N
50 N
40 N

APPENDIX 1
(Doc. 2879)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

Tokyo, Japan, 1985 March 15

PARTICIPANTS

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

UNITED STATES

Member	L. Jones	National Marine Mammal Laboratory, National Marine Fisheries Service
Advisers	M.L. Dahlberg	Auke Bay Laboratory, National Marine Fisheries Service
	J.G. Gissberg	Embassy of the United States

JAPAN

Member	Jun Ito	Far Seas Fisheries Research Laboratory, Fisheries Agency of Japan (FAJ)
Advisers	Kenji Takagi	Far Seas Fisheries Research Laboratory, FAJ
	Mamoru Kato	Same
	Seiji Ohsumi	Same
	Toshio Kasuya	Same
	Yoshimi Hatakeyama	National Research Institute of Fisheries Engineering, FAJ
	Nobuyuki Miyazaki	National Science Museum
	Eiichi Hasegawa	Nihon University
	Shogo Sugiura	International Affairs Division, FAJ
	Kiyoshi Yoshizaki	Same
	Isamu Takemoto	Same
	Toshihiko Okazaki	Same
	Daishiro Nagahata	Same
	Yasuyuki Horio	Same
	Junichi Hashizume	Offshore Fisheries Division, FAJ
	Shuichi Takehama	Research Division, FAJ
	Shigeto Hase	Same

Observers	Susumu Akiyama	Fishery Division, Gaimusho
	Kenro Iino	Same
	Koichiro Seki	Same
	Shintaro Enomoto	Japan Salmon Gillnet Fisheries Cooperative Associations
	Daihachi Misawa	Same
	Masayoshi Narita	Same
	Sannosuke Sato	Secretary General, Northern Seas Salmon Mothership Council
	Kunio Kasai	Fleet Commander, Nojima maru fleet
	Takahiro Ohtsuki	Nojima maru fleet
	Kenzo Kato	Same
	Shigeki Takizawa	Same
	Hiromi Ohba	Same
	Takayuki Tanaka	Fleet Commander, Kizan maru fleet
	Nobuki Okayama	Kizan maru fleet
	Shigeru Takechi	Same
	Toshio Hidaka	Fleet Commander, Meiyo maru fleet
	Kunio Sunoh	Meiyo maru fleet
	Hiroshi Miyauchi	Same
	Kazanori Kataoka	Same
	Hiroshi Ogiwara	Fleet Commander, Jinyo maru fleet
	Toshikatsu Maeda	Jinyo maru fleet
	Sohroku Gomikawa	Same

SECRETARIAT	C.R. Forrester
	Yuko Takahashi (Inter Group)
	Sawako Nagai
	Kazuko Shiozawa

INTERPRETERS	Yoshiko Soeda
	Reiko Hineno
	Setsuko Sakakibara

APPENDIX 2
(Doc. 2879)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

Tokyo, Japan, 1985 March 15

DOCUMENTS REVIEWED

2825 (Japan) Rev. 1 Outline of 1984 research on marine mammals, especially Dall's porpoise relating to the salmon gillnet fishery. Fisheries Agency of Japan, 1984 September.

2842 (U.S.) Rev. 1 Progress report for the 1984 field research on Dall's porpoise incidentally taken by the Japanese salmon mothership gillnet fishery. L.L. Jones, National Marine Mammal Laboratory, NMFS, Seattle, 1984.

2852 Report of the Ad Hoc Committee on Marine Mammals--1984.

2858 (Japan) Measurement of directivity of supersonic wave reflection from elements of salmon gillnet. Yoshimi Hatakeyama and Ken Ishii, National Research Institute of Fisheries Engineering, Tokyo, Japan, 1985 March.

2859 (Japan) Acoustic studies on Dall's porpoise on the high seas. Hajime Taketomi and Yoshimi Hatakeyama, National Research Institute of Fisheries Engineering, Tokyo, Japan, and Eiichi Hasegawa, College of Agriculture and Veterinary Science, Nihon University, Tokyo, Japan, 1985 March.

2860 (Japan) Feeding trial and acoustic studies on Dall's porpoise captured alive. Yoshimi Hatakeyama, National Research Institute of Fisheries Engineering, Tokyo, Japan, and Hiroshi Shimizu, Kamogawa Sea World, Chiba, Japan, 1985 March.

2862 (Japan) Report of the survey by the dedicated vessel Hoyo maru No. 53 in 1984. Nobuyuki Miyazaki, National Science Museum, and Yoshihiro Fujise, Faculty of Fisheries, Hokkaido University, 1985 March.

2863 (Japan) Estimation of Dall's porpoise abundance in the North Pacific using sighting data of Japanese salmon research vessels in 1984. Mamoru Kato, Fisheries Agency of Japan, 1985 March.

2864 (Japan) Number of marine mammals taken incidentally by Japanese mothership gillnet and landbased driftnet salmon fisheries in 1984. Fisheries Agency of Japan, 1985 January.

2866 (Japan) Salmon catch statistics for Japanese mothership gillnet and landbased driftnet fisheries, 1984. Fisheries Agency of Japan, 1985 February.

2869 (Japan) Proposed cruise plan of Japanese research vessels for salmon and marine mammals in the North Pacific Ocean, 1985. Fisheries Agency of Japan, 1985 March.

2871 Report of the Ad Hoc Salmon Research Coordinating Group, Tokyo, 1985 March 8.

2872 (Japan) Catch statistics of salmon and marine mammals caught in gillnets of Japanese salmon research vessels in 1984. Fisheries Agency of Japan, 1985 February.

2873 (Japan) The 1984 testing of fishing gears to prevent the incidental take of Dall's porpoise (Phocoenoides dalli). H. Ogiwara, K. Kataoka, H. Oba, T. Maeda, S. Takechi, and M. Narita, Northern Sea Salmon Mothership Council, Marine Mammal Project Team and Federation of Japan Salmon Fisheries Association, 1985 March.

2874 (U.S.) Response of Dall's porpoise (Phocoenoides dalli) to survey vessels in both offshore and nearshore waters: results of 1984 research. D.E. Withrow, G.C. Bouchet, and L.L. Jones, National Marine Mammal Laboratory, NMFS, Seattle, 1985 February.

2875 (U.S.) Biological studies on Dall's porpoise: progress report. L.L. Jones, D.W. Rice, and M.E. Gosho, National Marine Mammal Laboratory, NMFS, Seattle, 1985 March.

2876 (U.S. Proposed plan for U.S. research on Dall's porpoise for 1985. L.L. Jones, National Marine Mammal Laboratory, NMFS, Seattle, 1985.

2877 (U.S.) Estimation of the abundance of Dall's porpoise (Phocoenoides dalli): report of 1984 survey efforts and re-evaluation of previous survey efforts. G.C. Bouchet and A.G. Haines, National Marine Mammal Laboratory, NMFS, Seattle, 1985.

2878 (U.S./ Japan) Variability of readers and method of preparation in Dall's porpoise age determination. L. Jones and M. Gosho, National Marine Mammal Laboratory, NMFS, Seattle, T. Kasuya, Fisheries Agency of Japan, and N. Miyazaki, National Science Museum, Tokyo, Japan, 1985 March.
