

Report of the Special Meeting of the Scientific Committee to Consider the Japanese Research Permit (Feasibility Study)

The meeting was held at New Hall, Cambridge, from 15–17 December 1987 under the Chairmanship of R.L. Brownell Jr (USA). A list of participants is given in Annex A.

1. CHAIRMAN'S WELCOME AND OPENING REMARKS

The meeting was called after the Chairman of the Commission had agreed to a request from the Government of Japan that a Special Meeting be held to discuss the feasibility study it had proposed which involves a catch of up to 300 minke whales in Antarctic Area IV under Article VIII of the Convention (SC/D87/1). This study had originally been circulated on 20 October 1987 for written comments by Committee members and the comments received are included in the list of documents (Annex C). The *Note Verbal* requesting that a meeting be held had specified that the meeting be convened to 'sort out the views ... submitted by the members of the Scientific Committee'.

The Committee operated under the new Rule B.3 of the Commission's Rules of Procedure with respect to the requirements for credentials (*Rep. int. Whal. Commn* 38: 31). It agreed to allow two members from Norway and one from the UK to participate in the meeting on the basis that the credentials were expected. In due course the credentials did so arrive.

2. ADOPTION OF AGENDA

After considerable discussion as to the appropriateness of Item 4, the Committee agreed to the Agenda given in Annex B, noting that only a limited time would be allocated to that Item. A minority statement concerning this is given in Annex D.

3. ARRANGEMENTS FOR MEETING

3.1 Appointment of rapporteurs

It was agreed that Donovan, R. Holt and Harwood would act as rapporteurs.

3.2 Meeting time schedule

The Committee agreed to the schedule suggested by the Chairman. It was agreed that in order to have an adopted report available at the end of the meeting, all substantive discussion should be completed by the night of 16 December.

4. CLARIFICATION OF PURPOSE AND PROCEDURE

4.1 Quorum

This Item was included on the Agenda in response to comments made by S. Holt in SC/D87/17. He noted that in view of the short notice of the meeting it was possible that attendance would be sparse. Although this did not turn out to be the case (scientists from 15 countries of the 21 who

indicated that they wished to participate in the Scientific Committee attended), the Committee draws the attention of the Commission to potential problems which may arise out of the fact that the Committee's Rules do not specify a quorum. It was recognised that a rigid rule might be inappropriate for special meetings on specialised subjects, where only a small proportion of the Committee may possess the required expertise and thus wish to attend. It was agreed to recommend that the matter be discussed at the next Annual Meeting. It was agreed that the meeting was a properly constituted meeting of the Scientific Committee.

4.2 Formulation of advice, including voting

This Item was also included on the Agenda in response to comments made by S. Holt in SC/D87/17. He noted that recent experience indicated that the Committee was unlikely to achieve consensus on all issues and he believed that current reporting procedures frequently did not provide unequivocal advice to Commissioners. Ohsumi stated the nature of science is incompatible with a procedure which resolves the problems of divergent views with majority votes. Unlike the Commission, whose function is to make restrictive decisions over the conduct of the contracting parties, the Scientific Committee does not have to force its members to unify their advice to the Commission by majority votes. In discussion, the Committee agreed that it wished to continue in its deliberations to avoid voting. However, it noted the comments from the Technical Committee on the matter of interpretation of the Scientific Committee Report (*Rep. int. Whal. Commn* 38: 23–4) and agreed that, at least for this meeting, where there was not consensus in the report, members with various views would be identified. S. Holt indicated that with this understanding he would refrain from calling for indicative roll-call votes on any substantial matters of disagreement. The matter should be reviewed at the next Annual Meeting.

4.3 Status of the Report

The Secretary noted that this Report of a Special Meeting of the Scientific Committee on a special permit is under the Commission's 1987 resolution, a report to the Commission and will be sent to Commissioners, Contracting Governments and Scientific Committee members who did not attend the meeting, the day after the meeting is finished. It was agreed that the special circumstances of the meeting warranted extraordinary measures to ensure that the report reached Contracting Governments as quickly as possible. The Committee *recommends* that the Secretary sends the report by special delivery or similar priority post to the London Diplomatic Missions of Contracting Governments or direct to the Commissioners, as appropriate.

At Annual Meetings, the Report of the Scientific Committee is considered to be publicly available as from the opening of the Commission meeting. In this instance,

the Committee believes the Report of the Special Meeting should be considered to be available on 21 December, i.e. after the Report will have been received by the Commissioners.

5. CONSIDERATION OF FEASIBILITY STUDY ON SOUTHERN HEMISPHERE MINKE WHALE RESEARCH PLAN

At last year's Scientific Committee meeting, the Scientific Committee reviewed a Japanese Scientific Permit proposal (SC/39/O 4) entitled 'The programme for research on the Southern Hemisphere minke whale and for preliminary research on the marine ecosystem in the Antarctic'. With respect to minke whales, the aim of the programme was to obtain estimates of the biological parameters required for stock management, principally age-specific natural mortality rates. It was also intended to obtain estimates of various reproductive parameters (e.g. pregnancy rate, age at sexual maturity, etc.), stock size and the distribution and behaviour of whales. The discussion of the minke whale aspects of the programme in the Committee was reported under four main topics:

- (1) Was it true that the main reason for the Committee's inability to provide useful management advice to the Commission was because it did not have a reliable estimate of the natural mortality rate (M)?
- (2) Was it possible to distinguish between the effects of variations in recruitment, past fishing mortality and M on the population's age structure?
- (3) Would the programme lead to reliable estimates of age-specific M as it intended?
- (4) Did the advances in the development of alternative management procedures remove the need for improved estimates of M?

The Committee's 1987 Annual Meeting discussion of these four questions is given in *Rep. int. Whal. Commn* 38:55-7.

5.1 Presentation of Japanese research plan

The following is a summary of SC/D87/1. The reader is referred to that document and SC/D87/35 for further details.

The feasibility study was developed subsequent to discussions in the Scientific Committee and in the light of the decision to provide two vessels for the IDCR Southern Hemisphere minke whale assessment cruise. The aims of the research are:

- (1) to examine whether the collection of a representative sample of a minke whale population is possible (and within the operational constraints of the programme);
- (2) to examine the technical problems which may be encountered by using sampling vessels to concurrently carry out the sightings survey;
- (3) to examine possible segregation by age, sex, reproductive state, etc., particularly by latitude;
- (4) to investigate possible differences in school structure with school size;
- (5) to survey minke whales in lower latitudinal waters to provide information on stock identity, reproductive parameters, migration, etc.

In addition to the above it is proposed to carry out some preliminary studies on the use of biopsy darts to obtain samples and how these samples can be analysed, and also to maximise the biological information to be obtained from each animal.

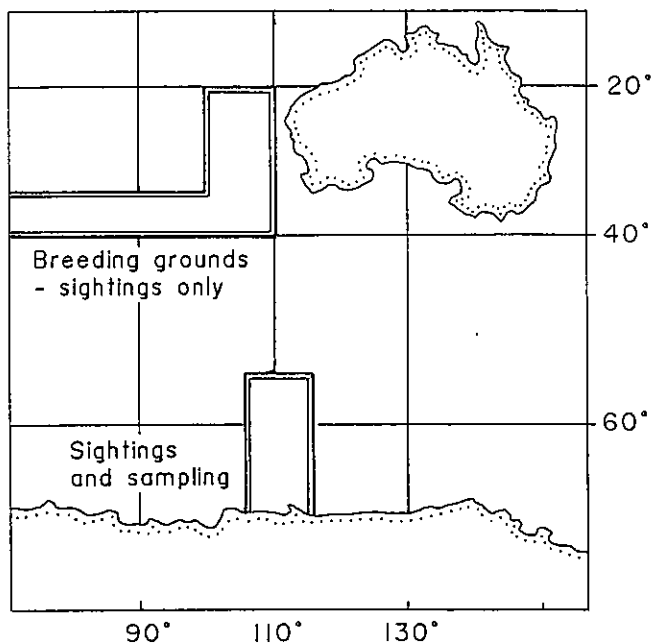


Fig. 1. Areas where preliminary research will take place.

It is intended that the research be carried out in the area shown in Fig. 1. Research will thus be conducted within and in more northerly areas than in the recent IDCR sightings cruises.

In view of the aim of the feasibility study, the question of the sampling scheme was considered particularly important. The survey area has been divided into two areas: the storm zone (55°-60°S) and the area south of 60°S. The paper and SC/D87/35 give details of the cruise tracks and procedures to be followed on encountering ice and poor weather. These aim to ensure that searching effort is randomly distributed in time and space.

All schools observed as primary sightings within 3 n. miles will be subject to sampling. Schools of one or two animals will be completely sampled. For schools of three or more, two animals, randomly chosen (SC/D87/35), will be taken. After sampling, the vessels will return to the original position at which they left the trackline and resume searching effort.

A list of all biological data and samples to be collected under the programme is given in Appendix 1 of SC/D87/35.

5.2 Consideration of written comments received on the feasibility study

These comments (SC/D87/2-31) were available to the meeting and are referred to in the report where appropriate.

5.3 Consideration of other documents received

At its 39th meeting some members of the Scientific Committee had expressed doubts about the ability of the analytical methodology described in the original Japanese proposal to distinguish the effects of variation in recruitment from those of natural mortality (M) or the

population's age structure. In SC/D87/39, de la Mare demonstrated that it is not possible to obtain unique estimates of recruitment and age-dependent mortality from catch-at-age data alone. He also showed that specifying trends in population size or recruitment could lead to estimates of age-dependent mortality rates and *vice versa*. However, it was also shown that the solution obtained was sensitive to bias in the specification of the external parameters. Butterworth in SC/D87/32 confirmed that estimation was only possible if additional information was available.

Nakamura in SC/D87/36 described a method for separating the effects of age, year and cohort using the prior information on the successive differences in these effect parameters. Akaike's Bayesian information criterion, ABIC, is used to select the optimal model. It is intended that this method, as it is or when refined, is used to analyse the age-structure data collected during the feasibility study and from the originally planned research.

Some members (Chapman, Arnborn, Cooke, Deimer, Holt, Horwood, Lankester, Lyrholm, de la Mare, Payne and Tillman) noted that the doubts about the estimation of M from age composition data had not been reduced by the introduction of the procedure described in SC/D87/36, particularly in light of de la Mare's results in SC/D87/39. Catch-at-age data do not uniquely determine the parameters of interest and no statistical procedure can overcome this fundamental aspect of the problem. They further noted that any estimates obtained from the procedure outlined in SC/D87/36 by Nakamura are entirely determined by the choice of the prior assumed distributions of the parameters. In effect, this means that the procedure could obtain any arbitrarily given value for the natural mortality or recruitment rate from any data set. Since there is no valid basis for selecting any particular estimate, the procedure proposed by Nakamura contributes no new information. While information on trends in population size or recruitment could provide estimates of age-specific mortality, this additional information could be used to estimate net recruitment rates directly, without any necessity to analyse age structure. Further they noted it was lack of reliable estimates of net recruitment rates that had made it impossible for the Scientific Committee to provide useful advice to the Commission on replacement yields and the effects of continuing catches for these stocks.

They further stated that there are limits on the feasible range for levels of and trends in mortality and recruitment and that some indication of the latter might be obtained by assuming ranges in pregnancy rates and age at first pregnancy. The implications of sampling error in catch-at-age and in population estimates for the estimates of natural mortality rates so obtained indicate that confidence intervals would be wide.

Magnusson, Ohsumi and Horwood stated that the method described in SC/D87/36 showed considerable promise.

Gunnlaugsson noted that limits on the feasible range for levels and trends might be narrowed by new unbiased biological material and that there was no reason to believe that age data could not be used in this case, as in most of fisheries science, to enhance the precision in estimates of recruitment. Furthermore, he noted that the suggested new management procedures could not alone locate the MSY level unless the stock was first reduced significantly below that level and then allowed to fluctuate around it.

Nakamura responded that he considered the criticism above by Chapman and others that information on trend in population size was still required for this method was based on a misunderstanding of Nakamura's model. He further stated that the model does not need actual values of trends in recruitment as prior information. Ikeda and Magnusson believed the simulation study in SC/D87/36 had indicated that reliable estimates of age-specific mortality and trends in recruitment can be obtained from catch-at-age data if it is correctly assumed that successive differences of effect parameters are small and change gradually. Ikeda further pointed out that, in view of the results of Nakamura's work, there had been no need to modify the original programme (SC/39/O 4).

6. REVIEW OF JAPANESE PROPOSAL UNDER THE CRITERIA SPECIFIED IN RESOLUTIONS ON SPECIAL PERMITS FOR SCIENTIFIC RESEARCH ADOPTED IN 1986 AND 1987 BY THE COMMISSION, AND THE SCIENTIFIC COMMITTEE'S GUIDELINES FOR REVIEW OF SCIENTIFIC PERMITS

The Committee agreed that its primary task was to review the feasibility study in the light of its own guidelines (Item 6.1) and the resolutions passed by the Commission at its 38th (Item 6.2) and its 39th (Item 6.3) meetings. It noted that in commenting on the feasibility study, it was inevitable that reference would also be made to the original proposal. The Committee was informed that there had been no changes to the original programme (SC/39/O 4).

S. Holt, Lankester, Lyrholm, de la Mare and Payne observed that paragraph 30 of the Schedule requires that special permit proposals be provided 'in sufficient time ...' and that the relatively few comments received from scientists, other than those from the proposing country, and the late arrival of others, showed that in this case insufficient time had been provided.

In response, Ohsumi stated that this feasibility research plan was circulated to the members of the Scientific Committee from the Secretariat on 20 October and he considers this to be sufficient time. In addition, he noted that many responses from other than the proposing country were received.

6.1 Annex L – Proposed guidelines for review of scientific permits (*Rep. int. Whal. Commn 36: 133*)

6.1.1 *A statement as to whether the permit proposal adequately specifies the four sets of information required under Paragraph 30 of the Schedule*

The Committee noted that: (a) the objectives of the research are stated; (b) the number and stock of the animals to be taken is stated – their size and sex cannot be determined in advance; (c) foreign scientists can participate; and (d) the proposal does take some account of the possible effect of the proposed catches on conservation of the stock, but see section 6.1.3 for a more detailed discussion.

6.1.2 *Comments on the objectives of the research to be carried out under the proposed scientific permit, including in particular how they might relate to research needs identified by the Scientific Committee*

In SC/D87/1 it was stated that the general purpose of the feasibility study will be to determine whether collection of samples fully reflecting the Southern Hemisphere minke whale population is possible.

Some members (Horwood, Arnbom, Chapman, Deimer, de la Mare, S. Holt, Lankester, Lyrholm, Payne, Tillman) noted that as the feasibility study is a precursor to the original programme, then unresolved problems with the original programme cast doubts on the necessity of the feasibility study. In this connection, they believed that since the main objective of the original programme to determine age-specific natural mortality could not be achieved with the proposed methods, even if random samples could be collected, the objectives in the feasibility study to investigate whether representative samples can be collected are not relevant.

In response, other members (Ikeda, Ohsumi, Kasuya, Nagasaki, Yamamura) noted that the original proposal had been prepared to provide necessary information for the assessment and management of stocks and that the feasibility study was an essential pre-requisite of this. Magnusson and Gunnlaugsson concurred with this view.

Five detailed objectives were given in SC/D87/1 of which the first four require a special permit. These are listed below.

- (1) The feasibility study of the newly refined sampling scheme designed for stochastic sampling in the original programme (e.g. whether the required number of samples can be collected by the designated method within the given period).
- (2) The feasibility study on the technical problems encountered in the survey by the sampling vessels which collect sighting data and whale samples concurrently.
- (3) Investigation on the extent of segregation by age, sex, reproductive condition, etc. in the distribution of the Southern Hemisphere minke whale, from samples collected from an area extending widely north and south.
- (4) Investigation on the uniformity or non-uniformity of the biological characteristics according to school size.

Some members (Arnbom, Chapman, Cooke, Deimer, de la Mare, S. Holt, Lankester, Lyrholm, Newman, Payne, Tillman) commented that the first objective could be investigated by an examination of existing data from sightings surveys and operational records (see Item 6.2.1); the problems to be resolved under objective 2 were not specified in the proposal (these were brought out in the discussion of Item 6.2.1); and that objectives 3 and 4 did not fulfill priority needs of the Scientific Committee although they might be of biological interest.

Other members (Gunnlaugsson, Magnusson, Øritsland, Sigurjónsson, Ikeda, Kasuya, Mae, Nagasaki, Ohsumi, Yamamura) noted that the Scientific Committee had frequently commented on the non-random nature of samples taken from the commercial catch. Therefore, the study's objective of collecting a representative sample would be of value to the Committee. While agreeing that research addressing this objective might be of value, Tillman expressed his view that it was not of high priority to the Committee.

6.1.3 A review of the most recent information on the stock or stocks concerned, including information on any exploitation, stock analysis and recommendations by the Scientific Committee to date (including, where appropriate, alternative analyses and conclusions and points of controversy)

No new information was available since the review conducted by the Scientific Committee at its last meeting.

It was agreed that this item had been covered by the Scientific Committee in its comments of the original proposal last June (*Rep. int. Whal. Commn* 38: 55-7).

6.1.4 Comments on the methodology of the proposed research and an evaluation of the likelihood that the methodology will lead to achievement of the scientific objectives. These comments may also include evaluation of the methodology in terms of current scientific knowledge

Some members (Tillman, Arnbom, Chapman, Cooke, Deimer, de la Mare, R. Holt, S. Holt, Lankester, Lyrholm, Newman, Payne) commented that there were many unresolved methodological problems in the proposal, in particular they were not convinced that a representative sample of the population would in fact be obtained. In any case, the representativeness of the sample could not be verified. Although biases due to the selectivity of the whalers would probably be reduced there were other sources of bias which had not been addressed: no whales would be taken north of 55°S; changes in the shape and distribution of the ice edge might lead to non-uniform coverage of this area; taking all schools sighted within 3 n.miles of the trackline could lead to large schools being over-represented in the sample; taking a maximum of two whales from each school could lead to unrepresentative sampling of large schools; and problems in the readability of earplugs from younger animals could bias the observed age distribution.

Magnusson noted that the representativeness of a sample could, in general, never be verified, so this was not a problem specific to the Japanese study. The aim should be to try to identify, and eliminate or minimise any possible causes for bias and the study attempts to do just that.

Other members (Ikeda, Mae, Nagasaki, Ohsumi, Yamamura) responded that if the sampling procedure described in SC/D87/35 proved practicable, a random sample of the population would be obtained. In addition, they pointed out that the research vessels would only approach the ice edge on four occasions so that changes in its distribution would have little effect. Although it would be preferable to take all individuals from every school encountered there were logistic constraints on the numbers that could actually be taken. Ikeda believed that if the sampling technique described in SC/D87/35 (which had been designed to remove the question of human selection and account, as far as possible, for our current knowledge of whale distribution and behaviour) prove practical, it would be possible, in conjunction with an examination of data from the commercial catch, to ascertain whether the sample was representative.

There was considerable discussion of improvements which had been made in age-determination techniques for minke whales. For approximately 20% of the whales an age determination was not made, but this was usually because the plug was not collected or was damaged. A high proportion of the unreadable plugs came from animals less than 15 years old. In an attempt to avoid these problems both earplugs would be collected from each animal, and tympanic bullae would be collected from younger animals to aid in their ageing. The image-analysis system described by Kato *et al.* (*Rep. int. Whal. Commn* 38: 269-72) would be used to improve the objectivity of layer counts.

Some members (Tillman, Arnbom, Chapman, Cooke, Deimer, de la Mare, R. Holt, S. Holt, Lankester, Lyrholm, Newman, Payne) indicated that, although these developments were commendable, they were not

sufficiently advanced to allay their present concerns about possible biases, particularly in the determination of the age of younger animals.

6.1.5 Comments on the adequacy and implications of specified arrangements for participation by scientists of other nations

It was clear to the Committee that Japan would welcome the participation of foreign scientists in the study. However, S. Holt, de la Mare and Payne noted that the timing of the decision to conduct the feasibility study had left insufficient time for some foreign scientists to make arrangements to participate, or for Governments to provide funding for them.

6.1.6 An evaluation of the specification in the permit proposal of 'possible effect on conservation of the stock'. As appropriate, the Scientific Committee may carry out its own analysis of the possible effects

When the Scientific Committee reviewed the original proposal no agreement could be reached on the status of the Area IV stock. However, a simulation study by Cooke (SC/39/Mi21) had indicated that current replacement yields might be between 466 and 1,106 whales of commercially takeable size (>27ft), and that the stock may be below MSYL. The Committee had recognised that this simulation study represented a useful general approach but recommended that it should be used with agreed estimates of abundance (for details see *Rep. int. Whal. Commn* 38: 55-7). Nevertheless, with the estimate for 'current' population size used in these simulations, the proposed catch of 300 whales is below the lowest estimate of current replacement yield from the simulations.

Some members (Horwood, Gunnlaugsson, Ikeda, Magnusson, Nagasaki, Newman, Ohsumi, Øritsland, Sigurjónsson, Tillman, Yamamura) considered that a take of 300 whales in one year will not affect the status of the stock. However, Tillman, Horwood and Newman introduced three points of concern. First is the uncertainty over the status of the stock, second is the uncertainty over the identity of the stock, and third is that the proposed take is from only one sixth of the area of the putative stock, and may cause some local decline in density.

While agreeing with the above concerns, Holt, Chapman, Cooke, de la Mare and Payne noted that, because the biological identity of the population of whales in the sampling area is not known and its state is uncertain, this matter cannot be evaluated.

6.2 Resolution on special permits for scientific research from the 38th Annual Meeting (*Rep. int. Whal. Commn* 37: 25)

6.2.1 the objectives of the research are not practically and scientifically feasible through non-lethal research techniques

Some members (Holt, Arnborn, Chapman, Cooke, Deimer, de la Mare, Lankester, Lyrholm, Newman, Payne, Tillman) commented that the aims (listed in Item 6.1.2) could be met by a combination of the analysis of already available time budget, segregation and school structure data from the commercial catch, previous sightings data, and the implementation of the feasibility study without the final harpooning of the animal. They also noted that aspects of schooling behaviour and segregation by reproductive condition (e.g. sightings of cow/calf pairs) might be addressed using direct observational techniques.

Other members (Ohsumi, Ikeda, Kasuya, Nagasaki, Yamamura) responded that non-lethal techniques would not enable these aims to be met. They noted that the sampling strategy was quite different to that of the commercial operations. In particular the random catching strategy required the taking of specific whales, rather than the nearest or easiest to catch whale; this might result in considerably extended chasing times. They also noted that sampling in the 'storm zone' may result in extended catching times, even though the proposed strategy to steam to the southern zone in poor weather may alleviate this somewhat. Extended catching times would reduce the time available for the sightings part of the survey and hence the precision of the resultant estimates.

These members, as well as Sigurjónsson, Øritsland and Magnusson, did not believe that currently available non-lethal techniques would enable the required biological information (sex, length, age, etc) to be obtained for minke whales.

Cooke noted that it was important not to forget the feasibility study should be considered in the context of the original proposal. He believed that the earlier discussion concerning the likelihood of being able to estimate M (see Item 5.1) meant that the primary objective of estimating M could not be met using either lethal or non-lethal techniques. Arnborn, Chapman, de la Mare, Harwood, S. Holt, Lankester, Lyrholm, Payne, Tillman concurred with this view.

6.2.2 the proposed research is intended, and structured accordingly to contribute information essential for rational management of the stock

Some members (Cooke, Arnborn, Chapman, Deimer, de la Mare, S. Holt, Lyrholm, Lankester, Payne, Tillman) believed that this item was best considered in the context of the original proposal. While it was intended to contribute information essential for rational management of the stock, they noted the impracticability of obtaining reliable estimates of M and they believed that M was not essential for management (discussed under Item 5.3). Therefore they concluded that the original proposal, and thus its feasibility study, is not structured to contribute information essential for the rational management of the stock.

While Horwood concurred with this view, he and Kasuya believed that incidental aspects of the programme will contribute new information about minke whales, and that this may prove to be of significance for our overall understanding of the biology of minke whales and the broader and long-term aspects of whale management.

Other members (Ikeda, Nagasaki, Ohsumi) responded that the estimation of M was both possible and essential for management (see Item 5.3) and thus that the proposed research is intended and structured accordingly to contribute information essential for rational management of the stock. Gunnlaugsson associated himself with this view.

6.2.3 the number, age and sex of whales to be taken are necessary to complete the research and will facilitate the conduct of the comprehensive assessment

Those members who believed that the feasibility study could be achieved by non-lethal means (Item 6.2.1) noted that this meant that no whales need be taken.

Holt noted that some Contracting Governments believed that the Comprehensive Assessment should be

completed by 1990. In this case he believed the results of the feasibility study and subsequent programme, if successful, would of necessity not be available by 1990 and thus could not facilitate the conduct of the Comprehensive Assessment. Other members (de la Mare, Arnbom, Chapman, Cooke, Lankester, Lyrholm, Payne, Tillman) considered that even if the results could be obtained in time they would not facilitate the Comprehensive Assessment.

Other members (Ikeda, Kasuya, Nagasaki, Ohsumi) responded that the number, age and sex of whales to be taken are necessary to complete the research and will facilitate the conduct of the Comprehensive Assessment.

6.2.4 whales will be killed in a manner consistent with the provisions of Section III [Para. 6] of the Schedule, due regard being had to whether there are compelling scientific reasons to the contrary*

In response to a question from S. Holt, Kasuya confirmed that all whales to be taken under the sampling scheme (including cows and accompanying calves if encountered) would be killed using explosive grenade harpoons. Kasuya believed that results from past sighting cruises suggest that sightings of mother-calf pairs will be rare, if they occur at all in the sampling area at that time of year.

6.3 Resolution on scientific research programmes from the 39th Annual Meeting (Chairman's Report of the 39th Annual Meeting)

6.3.1 The research addresses a question or questions that should be answered in order to conduct the comprehensive assessment or to meet other critically important research needs

Some members (Tillman, Arnbom, Chapman, Cooke, Deimer, de la Mare, S. Holt, Lankester, Lyrholm) commented that broad-spectrum research of the kind proposed in the feasibility study and the original proposal would not advance the Comprehensive Assessment. They believed that the Comprehensive Assessment would be best achieved by research addressed to specific issues, such as the estimation of net recruitment rates. None of the specific high priority aims of the feasibility study addressed issues which were of critical importance to the Scientific Committee deliberations.

Other members (Ikeda, Kasuya, Mae, Nagasaki, Ohsumi, Yamamura) responded that the wide-ranging studies described in the feasibility study and the original proposal would significantly increase knowledge of minke whale biology and would thus contribute to the

* See *Rep. int. Whal. Commn* 38: 13

Comprehensive Assessment. Gunnlaugsson, Magnusson, Øritsland and Sigurjónsson associated themselves with this view.

6.3.2 The research can be conducted without adversely affecting the overall status and trends of the stock in question or the success of the comprehensive assessment of such stock
Many members noted that its discussions under Item 6.1.6 had indicated that the take of 300 whales for one year would be unlikely to adversely affect the overall status and trends in the stock or the success of the Comprehensive Assessment. However, some members (Chapman, Arnbom, Cooke, de la Mare, S. Holt, Lankester, Lyrholm, Payne, Tillman) noted that the same assurance could not be given for the original programme, where larger catches will be taken over an extended period.

6.3.3 The research addresses a question or questions that cannot be answered by analysis of existing data and/or use of non-lethal research techniques

This point was discussed in considerable detail under Item 6.2.1. Some members (S. Holt, Arnbom, Chapman, Cooke, Deimer, de la Mare, Lankester, Lyrholm, Newman, Payne, Tillman) believed that the main aims of the feasibility study could be achieved through the analysis of existing data and the application of non-lethal methods. Others (Ikeda, Kasuya, Nagasaki, Ohsumi, Yamamura) responded that the aims could only be met by actually catching whales.

6.3.4 The research is likely to yield results leading to reliable answers to the question or questions being addressed

The Committee agreed that the study would demonstrate whether it is feasible to catch 300 whales with the sampling scheme proposed. However, some members (Cooke, Arnbom, de la Mare, S. Holt, Horwood, Lankester, Lyrholm, Payne, Tillman), referring to the discussion of the estimation of M (Item 5.3), believed that since the original proposal would not lead to reliable answers to the primary question it addressed in the long term, neither would the feasibility study.

In response, other members (Ikeda, Mae, Nagasaki, Ohsumi, Yamamura) repeated their belief that M could be obtained and thus that the long term study would provide reliable answers to the questions addressed in the proposal.

7. ADOPTION OF REPORT

The Committee wished to thank the Secretariat for its hard work during the meeting.

Annex A

List of Participants

ANTIGUA & BARBUDA R. S. Payne	K. Magnusson J. Sigurjónsson	NEW ZEALAND F. Newman	UNITED KINGDOM P.S. Hammond J. Harwood J.W. Horwood M. Klinowska
AUSTRALIA W.K. de la Mare	JAPAN K. Fukushima I. Ikeda T. Kasuya A. Mae S. Misaki (Interpreter) F. Nagasaki T. Nakamura S. Ohsumi K. Seki K. Shima K. Yamamura	NORWAY N. Øien T. Øritsland	UNITED STATES OF AMERICA R.L. Brownell Jr (Chairman) D.G. Chapman R. Holt D. McGovern M.F. Tillman
DENMARK F. Larsen		SEYCHELLES S.J. Holt	INVITED PARTICIPANT J.G. Cooke
GERMANY, FEDERAL REPUBLIC OF P. Deimer J. Ploetz		SPAIN L.G. de Sola S. Lens H. Quiroga	IWC G.P. Donovan R. Gambell
FRANCE J.-L. Durand		SWEDEN T. Arnbom T. Lyrholm	
ICELAND T. Gunnlaugsson	NETHERLANDS K. Lankester		

Annex B

Agenda

1. Chairman's welcome and opening remarks
2. Adoption of Agenda
3. Arrangements for meeting
 - 3.1 Appointment of rapporteurs
 - 3.2 Meeting time schedule
4. Clarification of purpose and procedure
 - 4.1 Quorum
 - 4.2 Formulation of advice, including voting
 - 4.3 Status of report
5. Consideration of Feasibility Study on Southern Hemisphere Minke Whale Research Plan
 - 5.1 Presentation of Japanese research plan
 - 5.2 Consideration of written comments received on the Feasibility Study
 - 5.3 Consideration of any other documents received
6. Review of Japanese proposal under the criteria specified in Resolutions on Special Permits for Scientific Research adopted in 1986 and 1987 by the Commission, and the Scientific Committee's guidelines for review of Scientific Permits
7. Adoption of Report

Annex C

List of Documents

SC/D87/

1 Government of Japan – The Research Plan for the Feasibility Study on 'The Program for Research on the Southern Hemisphere Minke Whale and for Preliminary Research on the Marine Ecosystem in the Antarctic'

Comments submitted by:

2 D. Goodman (USA)

3 M. Nerini (USA)

4 F. Nagasaki (Japan)

5 J. Horwood (UK)

Appendix

6 K. Lankester (Netherlands)

7 W.K. de la Mare (Australia)

8 T. Kasuya (Japan)

9 S. Ohsumi (Japan)

10 T. Smith and T. Polacheck (USA)

11 S.A. Mizroch (USA)

12 D.G. Chapman (USA)

13 T. Miyashita (Japan)

14 S.J. Holt (Seychelles)

15 M.F. Tillman (USA)

16 S. Wada (Japan)

17 S.J. Holt (Seychelles)

18 H. Kato (Japan)

19 P.B. Best (Invited Participant)

20 I. Ikeda (Japan)

21 F. Kasamatsu (Japan)

22 H. Kishino (Japan)

23 S.J. Holt (Seychelles)

24 R. Payne (Antigua & Barbuda)

25 M. Ivashin and R. Borodin (USSR)

26 J.M. Breiwick and L. Tsunoda (USA)

27 S. Reilly (USA)

28 J. Sigurjónsson (Iceland)

29 W.F. Perrin (USA)

30 T. Lyrholm (Sweden)

31 M. Cawthorn (New Zealand)

32 D.S. Butterworth – On the information content of catch-at-age data and some associated implications for Southern Hemisphere minke whales

33 D.S. Butterworth – IWC Scientific Committee Correspondence Group regarding the analysis of catch curve data

34 D.S. Butterworth (Invited Participant)

35 (Japan) Instruction note for researchers and crew on the implementation of research in the 1987/88 preliminary research plan

36 T. Nakamura – A Bayesian cohort model for catch-at-age data

37 J.G. Cooke (Invited Participant)

38 T. Gunnlaugsson and K.G. Magnusson (Iceland)

39 W.K. de la Mare – On the simultaneous estimation of natural mortality rate and population trend from catch-at-age data (SC/40/O 1)

40 Y. Gong (Republic of Korea)

Documents also available:

Commission Resolutions 1986 and 1987 and Scientific Committee Guidelines for Review of Scientific Permits
Extracts from the Report of Scientific Committee 1987 (Item 11.3.3; Annex R)

Annex D

Statement on Procedures Adopted During the Meeting

During the discussion of the Draft Agenda, Sigurjónsson expressed the view that it was not within the scope of the Committee's task at this special meeting to revise or make drastic changes to its procedures. He further felt it was inappropriate to spend the Committee's limited time at this meeting on such items as a quorum or voting procedures and had proposed, supported by Ohsumi, that these items be deleted from the Draft Agenda. On the Chairman's ruling that this Agenda Item should be retained, albeit with a time restraint, and the subsequent adoption of meeting procedures that he felt were equivalent to voting, Sigurjónsson had reserved his right to comment on this.

Furthermore, Sigurjónsson and Magnusson felt that the report should accurately reflect the discussion which took place and that it was unnatural that members who did not speak during the debate, or in some cases were not even present, should attach themselves during discussion of the Report to the various views expressed. They also believed that the procedure of calling for names to be associated with various views put unprecedented pressure on individual scientists.