SC/67A/SCSP/01

Proponents preliminary response to the Report of the Expert Panel to review the proposal for NEWREP-NP

Government of Japan

INTERNATIONAL WHALING COMMISSION

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ABSTRACT

The International Whaling Commission's Scientific Committee (IWC SC) convened a workshop to review the Proposed Research Plan for the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP). An international Panel of Experts carried out the review on the basis of the proposed research plan and seven documents prepared by IWC SC members and NEWREP-NP scientists. The report of the Review Panel is presented in document SC/67a/Repxx. The present paper summarizes comments and responses of the proponents on the evaluation and recommendations on the NEWREP-NP made by the Review Panel. A revised proposal of the research plan for NEWREP-NP will be prepared for the forthcoming IWC SC annual meeting, taking into account the recommendations from the Review Panel, and a consolidated Revised Research Plan for NEWREP-NP will be prepared after that meeting, taking account of the discussion of the IWC SC.

INTRODUCTION

The Government of Japan submitted a Proposed Research Plan for the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP) to the Chair of the IWC SC and the Secretary to the IWC in conformity with Paragraph 30 of the Schedule to the International Convention for the Regulation of Whaling (ICRW) and Annex P (IWC, 2017a) as a possible basis for issuing special permits in accordance with Article VIII, paragraph 1, of the ICRW. Subsequently, the IWC SC initiated a process for the specialist workshop to review of the proposal in conformity with Annex P.

The review followed the guidelines specified in the Annex P. An international Panel of experts ('Panel') carried out the review on the basis of the proposed research plan and seven documents prepared by IWC SC members and NEWREP-NP scientists ('proponents'). The report of the Panel which was also tasked with reviewing the JARPNII program including analyses of data up to 2016, is presented in document SC/67a/Repxx.

The Terms of Reference of the review workshop were the following as shown in Annex P (IWC, 2017a):

(1) Comment briefly on the perceived importance of the stated primary objectives from a scientific perspective and for the purposes of conservation and management, noting particularly the relevance of each to the work of the Scientific Committee;
(2) Evaluate whether the objectives of the research could be achieved by non-lethal methods or whether there are reasonably equivalent objectives that could be achieved non-lethally;
(3) For broad categories of objectives 1 and 2, evaluate whether the elements of the research that rely on lethally obtained data are likely to lead to improvements in the conservation and management of whales. This evaluation should include whether the proposal demonstrates the likely magnitude and relevance of improvements to conservation and management arising from the achievement of the programme objectives;
(4) Evaluate whether the design and implementation of the programme are reasonable in relation to achieving the programme's stated research objectives, and in particular, evaluate whether sample sizes and the spatial and temporal scales are reasonable in relation to the programme's stated research objectives and whether non-lethal alternatives are not feasible to either replace or reduce the size of the lethal sampling being proposed;
(5) Assess the degree to which the programme coordinates its activities with related research projects;
(6) Provide advice on the likely effects of the catches on the stock or stocks involved under various scenarios of length of the programme. This will include *inter alia* examination of abundance

estimates provided and may involve a different analysis to that provided in the original proposal, including assumptions that short permit proposals may be projected further into the future;
(7) Determine whether the programme has specified intermediate targets that would allow for an adequate review of progress relative to programme objectives; and
(8) Consider any other relevant matters as decided by the Scientific Committee.

The Panel convened to review the NEWREP-NP at the workshop in Tokyo from 30 January to 3 February 2017. The final report of the Panel was subsequently made available to the proponent on 3 March, 2017. The proponents express sincere appreciation to the Chair and other members of the Panel for their dedicated work shown in the report.

The proponents have duly considered the findings and recommendations made by the Panel. Below are their preliminary responses to the report of the Panel that are shared at this juncture for further review at the forthcoming IWC SC annual meeting. Additional analyses and explanations will be presented to that meeting (see section 2.11 for the proponents' understanding of the role of the Panel).

Revisions and supplementary information to the Proposed Research Plan will be submitted to the IWC SC separately from this document. The proponents welcome further discussions and comments at the IWC SC annual meeting. Giving due regard to such comments in the course of examination after the forthcoming IWC SC annual meeting, a final research plan for NEWREP-NP will be prepared as appropriate.

The list of relevant recommendations from the Panel and the general responses from the proponents are shown in Appendix 1. The proponents found that, while some recommendations are related to justification of the lethal component of the NEWREP-NP, most of them are concerned with other perspectives (e.g. improving analysis, sighting surveys, biopsy experiments). Many of the recommendations are considered useful and the proponents will reflect those recommendations in a revised research plan for NEWREP-NP, which is marked 'will be duly considered in revising the program' in the table in Appendix 1. In the text of the present document, the proponents' comments and responses focus on the main issues and key recommendations from the Panel report, especially where the proponents disagree with the Panel in whole or in part.

Extracts from the Panel report below are shown in italics while the responses from the proponents are shown in plain letters.

COMMENTS AND RESPONSES TO CONCLUSIONS AND RECOMMENDATIONS

1. Review of the JARPNII program

1.1 Panel conclusions on progress made on JARPNII recommendations

The Panel noted that relatively few new analyses were presented but noted that field and laboratory data for the period 2014-16, as specified by objective, had become available; this is discussed by topic below. SC/J17/JR02Rev1 contains some new information and results, and additional results were presented on ageing techniques at the review meeting, during open sessions (see Annex D). Recommendations for which substantial new information was available are discussed in the following paragraphs (Panel report pp 14).

Comment/response:
The proponents would like to clarify that at the 2016 IWC SC meeting it was agreed that the review of a new North Pacific proposal will also include the review of JARPNII with the inclusion of those data (2014 to 2016 data) that have become available since the final review of JARPNII (item 18.2 in the 2016 IWC SC meeting report). It should be noted that JARPNII program in those three years was adjusted in part to conduct a comparative study of lethal versus non-lethal techniques.

Although at this stage there might be few new analyses in terms of the three main objectives of JARPNII from the JARPNII final review in 2016, it should be highlighted that substantial field and laboratory data for the period 2014-16, specified by objective, had become available, and the results of the comparative study of lethal and non-lethal techniques was also presented at the review workshop.

1.2 Panel overall comment on the work to deal with uncertainty in prey consumption

The Panel stresses that for a final review, a synthesis document should be developed combining all of the parts of the uncertainty analysis to indicate the largest sources of uncertainty in consumption estimates, such a comprehensive overview has not yet been developed (pp 14).

Comment/response:
The proponents have conducted additional work and analyses, following the timeframe which was agreed by the IWC SC in 2016. The proponents are indeed preparing a synthesis document in line with the IWC SC-agreed timeframe. This synthesis document will be developed by the 2019 SC meeting (the IWC SC did not request the proponents to present such a document to the Panel at this review workshop).

1.3 Panel comments and recommendations on biopsy sampling

The Panel also agrees that it is more difficult to biopsy sample common minke whales than the other species. However, the Panel stresses that insufficient effort (number of targeted animals and expertise) had been put into the feasibility study for common minke whales to allow a conclusion to be reached on the efficiency for that species based upon adequate data. Only 17 common minke whales had been targeted during 2014-16 although determining this efficiency had been a key component of the reprioritisation of JARPN II for those years. The additional information provided by the proponents in response to questions (Annex D) confirmed that:

> *(a) the advice from previous Panels that scientists with expertise in biopsy sampling common minke whales should be involved had not been followed;*
> *(b) insufficient time had been allocated to the experiment for common minke whale biopsy sampling to determine if it was feasible;*
> *(c) the amount of effort dedicated to biopsy attempts for common minke whales was greatly exceeded by that effort used to catch common minke whales, making comparison of the two approaches infeasible.*

These factors render any analysis of relative efficiency for this species from the existing data premature. Given this, the Panel ***recommends*** *that a properly designed experiment to assess the efficiency of biopsy sampling of common minke whales be undertaken (there is already sufficient detail on catch to render additional capture experiments unnecessary). This should incorporate at least:*

> *(a) the use of the expected vessels in the programme (i.e. the small type whaling vessels);*
> *(b) the use of vessels (that may be different) considered suitable by scientists already experienced with biopsy sampling this species;*
> *(c) suitable levels of effort to allow a statistical comparison (effort for biopsy sampling should be measured or converted to the same effort used for examining catching efficiency);*
> *(d) effort should be carried out in various environmental conditions (e.g. sea state, swell, visibility) up to the maximum conditions that would apply to whaling;*
> *(e) advice and training from invited experienced minke whale biopsy samplers (e.g. Christian Ramp or Lars Kleivane);*
> *(f) analyses that provide a proper comparison of biopsy sampling and catching (including time to process samples under various variables such as experience of sampler, vessel, equipment, effort under similar conditions) (pp 15-16).* **(Recommendation 15)**

Comment/response:
The proponents disagree with these comments and recommendations on biopsy sampling. The proponents consider that they do not take full account of the information presented by the proponents to the Panel as

set out in Annex D of the Panel report (Morning paper, 31 January 2017-B). Important further information pertinent to this issue (particularly as regards the sufficiency of the trials already conducted) was provided in Table 3 and the associated text of that document. However, the Panel report fails to indicate whether it considered the said information, and if so, the reason why it disagrees with the conclusion to which this information leads the proponents.

It needs to be clarified again that the three main objectives of JARPNII remained the same during the 2014-16 period. The comparative study of lethal and non-lethal techniques including the biopsy method was added as a reprioritization of activities in that period. Nevertheless, the proponents allocated as much as 10% of time in biopsy sampling experiments, which the proponents consider appropriate. The proponents consider that the small number of biopsy samples is a consequence of the low efficiency of biopsy sampling, as indicated by the results presented in Annex D.

The proponents do, however, consider that further analyses of the existing information (such as those discussed during the Panel review) from this study could be useful, and plan to report the results of such analyses to the IWC SC.

(See also section 2.2 for the proponents' comments on 'evaluation of options in terms of lethal vs non-lethal methods in relation to the objectives' in the context of NEWREP-NP.)

1.4 Panel comments and recommendation on DNA techniques to examine faecal samples

The Panel therefore recommends that if additional studies with faecal samples are undertaken, application of techniques tailored to degraded DNA, i.e., amplification of small amplicons or hybrid capture, both methods well established in faecal, environmental and ancient DNA research. Further, if the prey species to be expected are known beforehand, amplification/hybrid capture can be designed to specifically target these species, enhancing both specificity and sensitivity (pp17).

Comment/response:
Application of the NGS technique commenced under the assumption that faecal samples can be obtained in the research area. The Panel agreed that it is not feasible to obtain faecal samples to provide diet information, and consequently no additional studies with faecal samples (including DNA analyses) will be conducted.

2. Review of the research program proposal (NEWREP-NP)

2.1 Evaluation of the objectives of the proposal

- *In conclusion, the Panel agrees that:*
  - *(a) Secondary Objective II(i) could contribute substantially to the in-depth assessment (but note the time-scale issue) and a possible future RMP Implementation, should one occur;*
  - *(b) Secondary Objective II(ii) could contribute to the in-depth assessment (but note the time-scale issue) and a possible future RMP Implementation, should one occur - however, the parameters that are the focus of this Secondary Objective are not the most important in terms of management;*
  - *(c) Secondary Objective II(iii) could contribute to a possible future RMP Implementation, should one occur but whilst stock structure is an extremely important issue, the extent of the contribution of the expected new information is unclear;*
  - *(d) Secondary Objective II(iv) could contribute to a possible future RMP Implementation should one occur;*
  - *(e) Secondary Objective II(v) should be considered an ancillary objective (pp 21).*

Comment/response:
Secondary Objective II (ii). Comments on the relevance to management of the parameters to be the focus of this objective are provided under Section 2.6 below.

Secondary Objective II (iii). The proponents agree with the Panel that the additional value new information might provide to the *in-depth assessment* (or any future *Implementation*) is unclear as the IWC SC has already agreed that the pelagic region of the NP contains only one stock. The proponents have modified this objective to read as follow: *'Study of the pattern of movement of whales of the 'pelagic stock' within the feeding grounds and between feeding and breeding grounds'.* The proponents aim to address this objective using the satellite tracking approach. As whales will be sampled to obtain age information, genetic samples will be also examined to update some analyses following recommendations from the IWC SC.

Secondary Objective II (v). The proponents agree that this secondary objective would be better treated as an ancillary objective. The aim and scope of this ancillary objective is explained under item 2.3 below.

- *In conclusion, whilst noting the proponents' additional information presented in Annex D, the Panel agrees that:*

  (a) Secondary Objectives I(i), I(ii) and I(iii) all address important aspects related to stock structure of common minke whales in the western North Pacific and would be of importance in future Implementation Reviews. The extent to which this requires additional samples rather than improved analyses of existing data for the Secondary Objectives is discussed elsewhere in this report (see Item 4.2);
  (b) Secondary Objective I(iv) would enhance the way trials are conditioned, but would not likely have the same magnitude of impact as Secondary Objectives I(i), I(ii), and I(iii); and
  (c) Secondary Objective I(v) should be considered ancillary as it is unlikely to make a direct contribution to future Implementation Reviews within a reasonable timeframe, if at all (pp 22).

Comment/response:
Secondary Objective I (iii). The proponents consider that all the recommendations from the JARPNII mid-term review workshop were addressed, and that results of the refined analyses following those recommendations were presented to the JARPNII final review workshop (IWC, 2017b). None of these refined analyses support the existence of a coastal Ow stock. Therefore the proponents consider Stock Hypothesis C to be implausible for reasons given in the original proposal. The proponents will be rewording the text in our revised proposal to make our position clear, which is that the further genetics work proposed is simply routine monitoring to check for no change in a current position that is already clear, and is proposed only because genetics information also becomes available, incidental to the necessary collection of future age data under the program.

Secondary Objective I (iv). In view of the text in the Panel Review report, the proponents wish to emphasize here the recommendation from the JARPNII final review workshop endorsed by the IWC SC:*'Thus, if the Implementation Simulation Trials for the western North Pacific minke whales are to be revised in the future, the age data should be included in the conditioning process'*. The proponents understand the IWC SC to have confirmed the fundamental importance of the use of age data in conditioning trials, and this is difficult to reconcile with the Panel comment above, particularly for the reasons elaborated in Section 2.5 below.

Secondary Objective I (v). The proponents agree that this secondary objective would be better treated as an ancillary objective. The aim and scope of this ancillary objective is explained under Section 2.3 below.

- *The next Implementation Review is due to start in 2018 and will incorporate data and analyses from the JARPNII programme. Priority should be given to completion of all of the recommendations from the review panel and the Scientific Committee. However, the Panel agrees that any outcomes of NEWREP-NP are most likely to feed into the Implementation Review that is scheduled to start in 2024 ad that this implies that sufficient priority and resources must be put into completed analyses being ready by the proposed mid-term review (pp21)*

Comment/response: Since the points raised here by the Panel also have a bearing on the response to the issue raised under section 2.5, a consolidated response is rather given there.

2.2 Evaluation of options in terms of lethal vs non-lethal methods in relation to the objectives

- *The Panel agrees that certain data types (e.g. age and body measurements) require lethal sampling and may in principle provide improved conservation and management but also recommends that a more thorough quantitative review of the contribution of those data types to the ability of the proponents to meet their primary objectives is warranted (and see Item 4.2 for a fuller evaluation of options in terms of lethal vs non-lethal methods in relation to the objectives). Kitakado et al. (2016) provide initial work to show modifying the CLA to use age data could improve the performance of the IWC's whale management procedure and similar work could be conducted for common minke whales in the western North Pacific. However, modification of the CLA, as it is applied to common minke whales in the western North Pacific is not proposed under NEWREP-NP (pp 23).* (**Recommendation 1**)

Comment/response:
Since the points raised here by the Panel also have a bearing on the response to the issue raised under section 2.5, a consolidated response is rather given there.

- *If available data do not allow for a full comparison of relevant lethal and non-lethal techniques of a proposal, a focussed pilot study to enable a full and proper evaluation of lethal vs present non-lethal methods integrated across objectives should be undertaken, prior to a full programme starting; where such data already exist then the desktop-study evaluation should be undertaken before the permit programme begins. Such evaluations could be undertaken in light of an expanded framework as recommended under Item 3.3.4 and must be properly designed to enable more effective reviews of sample sizes/methods during mid-term reviews (pp 23).* (**Recommendation 2**)

Comment/response:
Though this recommendation is one directed to the SC, the proponents wish to place on record their strong reservations about its contents. The proponents are not of the view that inclusion of an evaluation of lethal vs non-lethal methods as a primary objective of any Special Permit program is appropriate. The proponents consider that the achievements of the main purpose of the research program, such as the contribution to assessment and management of whale stocks, will be adversely affected by devoting considerable effort to an evaluation that does not contribute directly to the primary objectives. The proponents also consider that, *inter alia*, their response under section 2.5 provides strong justification for this view as well as showing that the need for lethal sampling has already been established. Such evaluations of non-lethal techniques should be performed incidental to the research program unless the proponents of a program wish otherwise. The proponents of NEWREP-NP will continue the comparative experiments under its program to the extent considered necessary, but they will be treated as additional research activities not associated with the main objectives.

2.3 Evaluation of the field and analytical methods (Primary Objectives I and II)

- *The Panel concludes that it would be more productive for the proponents to focus on the impacts of shorter-term (inter-annual) environmental variability on the distribution and prey consumption of the whales which may in the future allow examination of major environmental changes should they occur (pp 26).*

Comment/response:
The proponents have similar point of view to the Panel regarding this issue. The proponents appreciate the Panel's positive comments and will clarify this objective further.

- *The Panel concludes that, as stated this objective is unrealistic within the given timeframe. In any event, the present proposal does not provide sufficient information to demonstrate that the proponents will be able to meet this Secondary Objective. To demonstrate this feasibility, the Panel recommends that the proponents must specify more fully:*

(a) quantitative criteria with respect to identifying [major] environmental change and potential responses by whales;
(b) the adequacy of the methods and effort to specify the distribution, seasonality, and precision of the environmental data, for the regions in which the whales being studied are feeding;
(c) taking into account uncertainty, conduct a power analysis to determine the sample sizes/effort for the characterisation of the environment and whales (including distribution and prey use) needed to determine if there are changes before and after a major environmental change occurred, should one occur during the programme (pp 27). **(Recommendation 6)**

Comment/response:
The proponents stress that the original aim of Secondary Objectives I(v) and II(v) is to contribute to the understanding of the implications of environmental change in terms of whale stock management, rather than detection of a major environment change itself. The proponents do recognize that, based on current scientific knowledge, it is difficult to predict whether a major environmental change (categorized as a 'regime shift') would occur within the proposed research period of NEWREP-NP. Hence the original wording of this proposal may have been inappropriate, and consideration will be given to amending this wording. In any case, given the Panel's conclusion, the original Secondary Objectives I(v) and II(v) will be treated as Ancillary rather than Secondary Objectives. Since these Ancillary Objectives will be investigated using data obtained through surveys designed for other Primary and Secondary Objectives (related to age data), points ((a)-(c)) raised by the Panel are difficult to address. However, the proponents will consider these points when conducting any analyses.

The proponents will monitor spatial distribution, prey species compositions and body conditions of target whales and they will investigate potential influential factors (e.g. available prey), if temporal changes (which could ultimately be related to major change) in whales are observed. Such monitoring and investigation will contribute to future *in-depth assessment* (IA) of whales as in the case of Antarctic minke whales.

2.4 Evaluation of sampling design (lethal sampling)

- *The Panel agrees that there are several aspects of this procedure that make the design unusual for a scientific survey and will complicate and possibly compromise data analyses. In particular, the Panel concludes that:*

(a) the design would lead to oversampling of the areas close to ports (the Panel was informed that an additional land-based station may be established in the northern Sanriku to better cover sub-areas 7CS and 7CN);
(b) the boats can search freely once they reach 30 n.miles from port if no whales have been encountered en route from port, which means the design is not fully specified in terms of the catches by the port-based boats; and
(c) the Nisshin Maru will conduct sampling if the number of common minke whales caught does not reach the target number, but no sampling plan for this contingency is provided. (pp 29)

- *The Panel agrees that the impact of non-random sampling of the inshore areas has different consequences for each Secondary Objective under primary objective I. In particular, the Panel concludes that it will substantially complicate achievement of Secondary Objective I(i), which investigates the spatial and temporal occurrence of J-stock animals around Japan by sex, age and reproductive state for which random sampling is ideal if not essential. In addition, the power to achieve Secondary Objective I(iii) depends on sample size in the inshore and offshore areas (see Item 4.2.4), but also how samples are collected within sub-areas 7CS (n=50), 7CN (50) and 11 (147). In terms of resolving stock structure from genetic analyses (traditional*

population genetic as well as kinship-based inference methods), the key issue is to obtain and include representative samples from all areas to be included in the assessment of stock structure. Whilst random sampling is not essential to include age data in an SCAA analysis, lack of random sampling will reduce statistical power to detect stock structure as well as it will necessitate estimation of selectivity parameters and hence to increased overdispersion of any resulting age data relative to the case of uniform (or near uniform) sampling by sex and age. Estimation of additional parameters and larger overdispersion will further reduce the power of the age data to detect trends in recruitment (which is already poor over the short- to medium-term; see Item 4.2.4). The Panel recommends that analyses be conducted, before the start of the programme, to assess the extent of loss in statistical power and precision due to the sampling strategy for the objectives related to common minke whales and the implications for meeting Secondary Objectives. The Panel also recommends that the experience/data gained from JARPN II should be used by the proponents to investigate (a) – (c) above (pp 29). **(Recommendation 11)**

Comment/response:
The proponents understand that the Panel is concerned with the representativeness of data arising from the non-random sampling design.

The coastal component of sampling survey is conducted systematically to secure a degree of representativeness through application of a predetermined protocol in which the angle departing from the port is chosen at random every day, rather than covering the survey area in a manner that achieves equal probability of sampling any part of that area. Although this does mean that the sampling might be selective with respect to age/length, such non-random sampling is only one of the factors that can contribute to overdispersion of catch-at-age data as well as lead to a need to estimate selectivity functions.

The overdispersion value used in the SCAA related results in Annex 12 was obtained empirically (i.e. from the residuals of the fit of the model to the data), and hence incorporates the combined effects of all these factors, including non-random sampling. Such overdispersion has thus been duly taken into account in the sample size calculations, and an upper bound for the value sought by the Panel, together with its consequences, has thus already been provided.

The sampling under JARPNII that informed the analysis above is planned to be improved under NEWREP-NP, including through broader spatial coverage, so that the magnitude of these consequences will diminish in future. Furthermore, the proponents intend to conduct evaluations attempting to assess how corrections (in the form of weightings) might be applied to future analyses to adjust for non-randomness. Thus the proponents do not see any strong reason to alter the proposed sampling survey design.

Regarding the three specific concerns raised by the Panel, the proponents' views on points (a) and (b) have been explained above. Regarding point (c) ('contingency sampling plan by Nisshinmaru'), it would be inappropriate to decide the exact details of such a contingency plan in advance since some degree of flexibility is necessary. Nonetheless, the proponents will include some general principles in the revised research plan.

- *The Panel noted that the offshore sampling design matches that on which JARPN II was based. The Panel concludes that the given sampling lines will not achieve uniform coverage of the research area and do not cover the whole distribution range of each whale species (Bando et al., 2016). The unbalanced sample sizes in the offshore (27) and inshore (100) areas will complicate the estimation of the selectivity pattern for offshore common minke whales (if there is a single O-stock). It may lead to a dome-shaped selectivity, which will need to be accounted for in any SCAA analysis, at the cost of additional parameters and lower precision. The survey plan allows for the possibility of taking multiple animals from a school, which could impact the power of analyses related to diet and genetic structure owing to the possibility of pseudo-replication. Additionally, the rather small sample size offshore may reduce the likelihood of detecting the effects of a major environmental shift on both the diets and the distributions of common minke*

whales. The Panel concludes that Proponents must thoroughly consider these issues and provide further justification/modification to their current data collection plan (pp 29-30).

- *The Panel noted that the total sample size is split between sub-areas 7 and 8+9 based on historical catches, adjusting the sample sizes to account for age-readability and the proportion of the catch that is likely to be J-stock. The overall sample size would be lower if more animals were taken in sub-areas 8+9, because the J-stock proportion is lower offshore. The Panel agrees that the impact of the split of the total sample size between sub-areas 7 and 8+9 will impact the ability to achieve Secondary Objective I(iii). Uneven sampling efforts also impact some genetic analyses, such as the identification of clusters (usually assumed to represent populations) using program STRUCTURE (e.g. Landguth and Schwartz, 2014). Disproportional sample sizes from different populations reduce the probability of detecting dyads of close relatives where each member is sampled in different populations, which constitutes the basic data points to infer dispersal rates from identification of close kin.*

  The Panel noted that concentrating sampling over short periods increases the probability of detecting dyads of close kin. This has potential consequences in terms of detecting dyads of close kin across sub-areas assumed to contain common minke whales from different stocks (e.g. stock structure hypothesis III) where the large historical datasets will decrease in utility due to natural and whaling mortalities that eventually remove related individuals, which, in turn, effectively will reduce the probability that new samples are close kin to older samples.

  Finally, the Panel agrees that the small sample size of common minke whales in the offshore area (sub-areas 8+9) will reduce the ability to detect a change in whale diets in response to major environmental changes (pp 31).

Comment/response:
These comments from the Panel are mainly related to the unbalanced nature of the sampling between the coastal and offshore areas, and the implication of this on the relevant analyses for meeting the research objectives. The proponents agree with the Panel's concern and therefore they will consider a more balanced sampling ratio for the coastal and offshore areas.

The Panel also comments on the possibility of sampling multiple animals from a school. The proponents do not consider this as a matter of concern because almost all schools of common minke whales in the survey area consist of a single animal only.

2.5 Evaluation of the sample size (common minke whale sub-areas 7-9)

- *The sample size (127) for common minke whales in sub-areas 7-9 is based on the ability to estimate recruitment when there is a 30% reduction in recruits-per-female 10 years after the start of NEWREP-NP and when carrying capacity changes (as for the P-stock of Antarctic minke whales – Punt et al., 2014). However, the proponents did not provide a strong link between a reduction in recruits-per-female and the primary or any of the Secondary Objectives, in particular evaluation of potential methods for setting sustainable catch limits for coastal areas east of Japan using the RMP (Primary Objective I). The analyses do show some value in including age data in assessments of common minke whales based on SCAA, and allowing for variation in recruitment will improve the realism of the Implementation Simulation Trials for the western North Pacific common minke whales. Nevertheless, the Panel agrees that even if the power to detect a change in recruitment was high, the analyses in Annex 12 of SC/F17/JR01 do* ***not*** *provide a defensible basis for the currently assigned sample size (i.e. 50 from 7CS, 50 from 7CN and 27 from 7E-8-9). The Addendum to Annex 12 (SC/J17/JR04) shows improved estimation performance for a step-function reduction in recruitment ten years into the programme compared to Annex 12 where the proposed SCAA approach is not able to detect a change in recruitment even after 50 years, i.e. well beyond the project timeframe of 12 years. The Panel* ***notes*** *that the SCAA was able to provide unbiased estimates of total numbers even without age data. However, as the proponents note in Annex D, the analyses show how the conditioning can be improved in the future (if a substantial reduction in recruitment occurred)*

but no analyses are provided to qualify the improvement in RMP performance. They also state in Annex D that a 'detailed calculation for this would need to be based on the planned updated conditioned (including with the age data available at that time) set of NP minke ISTs, and consequently must await completion of that exercise which is the responsibility of the IWC Scientific Committee'.

The Panel had several technical concerns with the analyses presented which could be addressed in further analyses. However, the Panel stresses that these would not remove the fundamental problem that the planned sample size is not fully justified for the primary objective or any of the Secondary Objectives. While Annex D does refer to the use of age data for Objective I (iv), the Panel believes that the link with conditioning is rather weak and the number chosen not well justified in terms of management performance. These concerns are summarised below.

(a) The analysis assumes that there is single O-stock, when in fact testing the hypothesis whether there is one O-stock is one of the Secondary Objectives. In principle, the analysis of sample size should have been conducted for both the one-O-stock and the two-O-stock hypotheses, to avoid potential issues of circularity and prejudging the results of other Secondary Objectives.
(b) The estimator is provided with the true values for several (unknown) key parameters including natural mortality, MSYL, and, in particular, MSYR, which would increase (overestimate) the power to detect changes in recruitment.
(c) Selectivity post-1988 equals selectivity pre-1998, but with female selectivity multiplied by an estimated constant. The rationale for this is not provided, but the SCAA estimator knows that this is the parameterization of selectivity, which would increase (overestimate) the ability to estimate trends in recruitment.
(d) The abundance data are provided as estimates of mature female numbers, but in actuality the estimates of abundance would be estimates of 1+ numbers (pp 30-31).

Comment/response:
On page 22 of their report, the Panel state that they have noted the additional information provided by the proponents in Annex D. However it appears from the balance of the Panel's text that they do not seem to have addressed the proponents' explanations on this matter expressed there under heading 'Overview of the Proponents Views Related to Age Data' (Morning Paper distributed to the Panel by the proponents on 2 February 2017), or to have offered any counter to the arguments which the proponents presented therein. This is a serious concern related to a fundamental matter that underpins the rationale for the proponents' approach; and furthermore full understanding of that rationale would have rendered many if not all of the criticisms offered by the Panel on this matter unnecessary.

What follows repeats some of the pertinent commentary from Annex D, but is preliminary in that further evidence in support of the proponents' views will be presented to the coming meeting of the Scientific Committee.

The SCAA assessment of Antarctic minke whale populations by Punt *et al*. (2014) was a watershed advance for the IWC SC because, through its ability to take account of age in addition to survey abundance data, it pointed to the extent of recruitment changes[1] that could occur, and its results did not conform particularly closely to the behaviour predicted by the standard population models used to assess and hence to provide baseline *ISTs* for baleen whale populations. Figure 1 contrasts the results from an application by GOJ (2016) of the Punt *et al.* SCAA methodology to those that would follow from a FITTER approach necessitated if only catch and survey abundance information were available (as required for the RMP).

[1] Recruitment refers to the numbers of young whales added to the population each year (also called a 'cohort'). This cannot be determined well if only a series of abundance estimates of the whole population are available. The availability of age data, however, allows estimates of total population numbers to be split into the numbers of each cohort present that year. From one survey only, such estimates would not be precise, but the accumulation of age data over successive years allows for multiple estimates of the size of each cohort, and it is effectively the combination of these which ultimately allows for reasonable estimates of annual recruitment to be obtained.

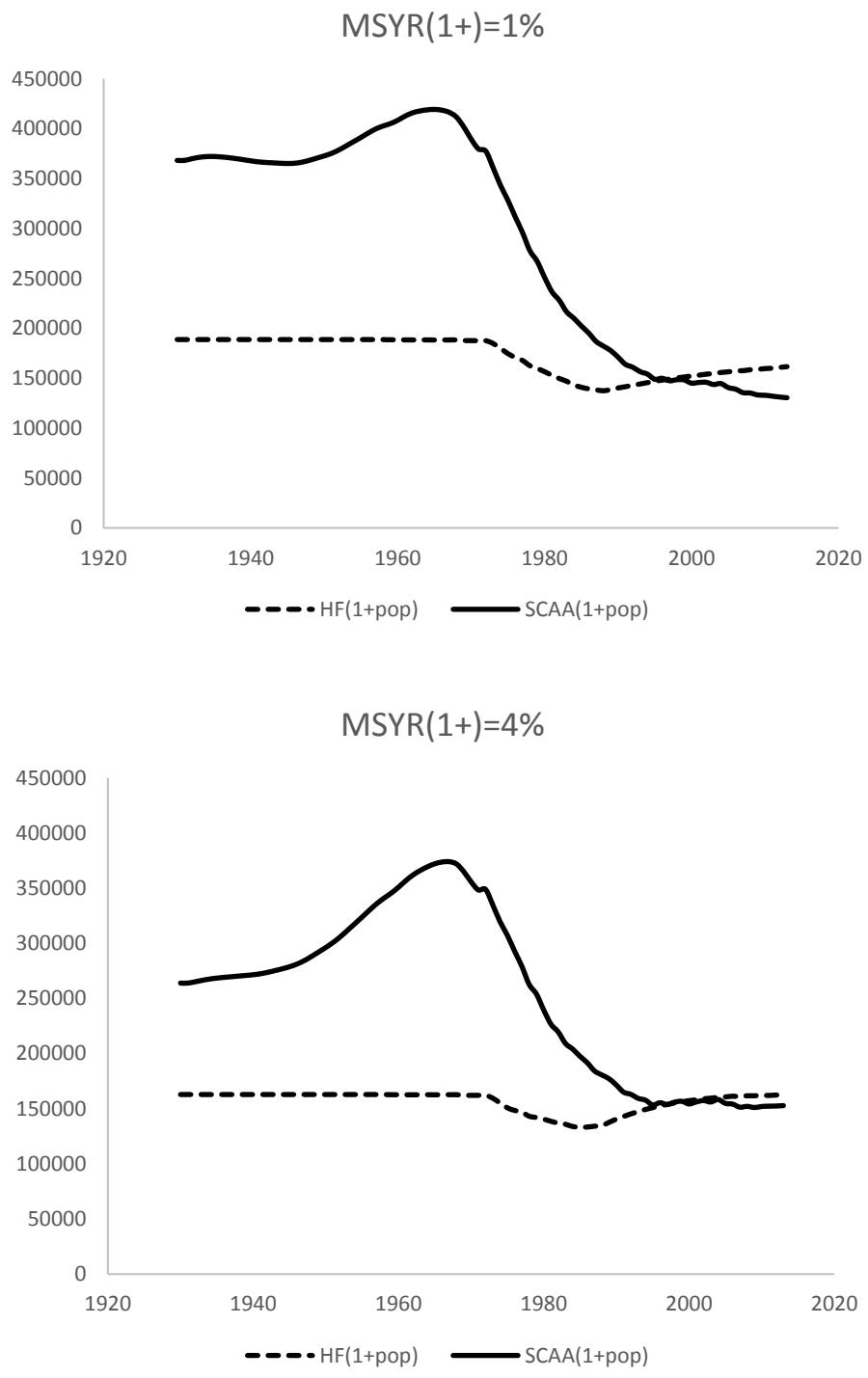

Figure 1: Two approaches to conditioning potential *IST*s for the I stock of Antarctic minke whales are compared. The first uses the conventional approach for baseline trials in RMP *Implementations*, with only past catch and survey abundance estimates (in this instance from the IDCR-SOWER cruises) available, and is calculated here using the FITTER-with-fixed-MSYR methodology. The second uses the SCAA approach of Punt *et al*. (2014), as implemented by GOJ (2016), which can in addition take age data into account. Results are shown for the 1+ population trajectory for two different values of MSYR(1+). The very different perception of the dynamics of the population that follows once age data are available for use in the conditioning, and show that catches have not been the primary determinant of the population's behaviour, is readily evident.

The considerable difference is obvious; self-evidently optimal management based the scenario (and associated sensitivities) provided by the SCAA, which can estimate recruitment directly through the availability of age data, would be very different to that from the deterministic stock-recruitment relationship scenarios (as, e.g., the FITTER methodology has to assume), which at best would need to consider a very wide range of robust tests, resulting in an inefficient approach (less allowable catch for the same perceived risk).

The Punt *et al*. (2014) analysis constitutes an important step in contributing to the evolution of the RMP towards a more efficient version which is based on better conditioned operating models, and is stock specific (as are the various current AWMPs) rather than generic as at present. Age data contribute to this better conditioning through allowing much improved estimation of recruitment and its changes and may also be able to improve the performance of a refined version of the RMP, as has been demonstrated in the case of Antarctic minke whales (GOJ, 2016). The NEWREP-NP proposal, with its analyses, has the intent that the age data to be collected will contribute to this evolutionary process.

The JARPN II Final review workshop report, endorsed by the IWC SC, noted that 'if the *Implementation Simulation Trials* (*IST*s) for the western North Pacific minke whales are to be revised in future, the age data should be included in the conditioning process' (SC/66b/Rep06, Report of the Expert Panel of the final review on the western North Pacific Japanese Special Permit program (JARPN II), 4.4.1). The example above shows that age data, whenever potentially available, are needed for conditioning such trials so that recruitment and its changes may be reflected far better. This is the primary reason why the proponents supported the use of age data for the conditioning of the next set of *ISTs* for the North Pacific common minke whale, which they understood to be endorsed also by the IWC SC. Naturally recruitment is hardly estimable for other than past years spanned by the collection of age data, so for future sets of *ISTs* also to best reflect underlying dynamics, age data must continue to be collected, notwithstanding the fact that the impact of data from the first few years of NEWREP-NP to the next NP common minke whale *Implementation Review* may not be that large. Thus when the Panel states in regard to the contribution of further age data that this need for further collection is '[u]nclear because there are substantial historical samples which may be sufficient to improve conditioning without additional samples being collected' (page 44), they appear to have completely misunderstood the primary reason underlying the proponents proposal for collection of these further data.

The Panel report states (page 7) that '[i]n some cases, additional data can be valuable to, but are not essential for, the process [of conditioning]' (page 22) and that 'there is no requirement within the RMP process to include age data (or any biological data) when conditioning trials'. Formally the latter is, of course, correct. Conditioning trials can be simpler and such trials can be conditioned on fewer data. However, as explained above, this then requires the consideration of a much wider range of robustness tests, resulting in inefficient management. The Panel statement is hence difficult to reconcile with the SC agreement expressed last year, which was understood to replicate the proponents' views on this issue.

The proponents' approach is entirely in line with fisheries management approaches elsewhere, including in the development of MPs in other Regional Fisheries Management Organizations (RFMO). There a high premium is placed on obtaining and improving age data and/or on equivalent information to provide information on recruitment changes. In contrast the view which seems to underlie the Panel report is out of line with such international practice. If the Panel disagrees with this widespread international consensus, it would have seemed obligated to first provide strong reasons for its views that these other fisheries organisations are wrong, at least before criticising the proponents for (asserted) inadequate justification. This is in circumstances where the proponents' have already provided more than is standardly required by these other organisations which consider the beneficial nature of acquiring ageing information to be effectively self-evident.

The Panel report states that 'GOJ (2016) provide initial work to show modifying the *CLA* to use age data could improve the performance of the IWC's whale management procedure and similar work could be conducted for common minke whales in the western North Pacific. However, modification of the *CLA*, as

it is applied to common minke whales in the western North Pacific is not proposed under NEWREP-NP' (page 23). It should be noted that the last sentence should be seen rather in the context of the 'Overview of the Proponents' Views Related to Age Data' (Morning Paper distributed to the Panel by the proponents on 2 February 2017) to be found in Annex D that is referenced above regarding RMP evolution. Furthermore, while age data could be used in a future RMP in a similar way to that in the proposal in Government of Japan (2016), the primary contribution of such data remains to the conditioning of *ISTs*, and (as has proven to be the preferred approach for other MPs internationally) their contribution to feedback adjustments to management measures might be through the regular re-conditioning of the *IST*s rather than by changes to the MP itself.

Moving on then to the matter of sample size, it is perhaps helpful to first summarise the proponents' rationale for the number advanced, before elaborating upon it in more detail. This rationale is that:

- Age data are needed for improved conditioning of *IST*s for testing management procedures, to inform better on recruitment changes and hence improves the trials' realism
- Simulation results indicate that larger age samples would allow better estimation of recruitment changes for this NP minke situation
- On the other hand, operational considerations regarding the practically maximum sample size and the effect on the population must also be taken into account in determining the optimal sample size
- Therefore, the optimal sample size should meet both of these criteria: that it is operationally maximal and is also sufficient to provide meaningful improvement in the estimation of recruitment changes; simulation results (provided in Annex 12) indicate that is the case for this NP minke situation. (The matter of effect on the population is dealt with under section 2.8.)

To elaborate then, given the clear and widely accepted benefits in principle of the inclusion of ageing data to the *IST* conditioning process, the only question that then remains is how much age data is needed to make a meaningful improvement to that NP minke whale conditioning. A detailed calculation for this would need to be based on the planned updated conditioned (including with the age data available at that time) set of NP minke *ISTs*, and consequently would need to await completion of that exercise which is the responsibility of the IWC SC.

However, in the interim, much simpler computations are adequate to bound the problem, and have already been conducted in Annex 12 to the original proposal and its Appendix. These were based on a simpler model broadly accepted when presented to the JARPN II review, which was intended to be illustrative and to assist this bounding.

Note first that the model showed performance improved with increases in the sample size aged, and that these improvements were meaningful over the sample sizes examined which were consistent with what was operationally practical[2]. This last consideration then provides the desirable sample size, but always provided that a) the criterion of no adverse effect on the population is met, and b) that sample size is itself sufficient to provide a meaningful improvement in performance. The intent of the calculations of Annex 12 was to address this last question, and this was successfully achieved in the Appendix thereto – an exercise for which primarily only relative measures of performance when comparing results with to those without ageing data are needed. Once the updated conditioning is complete, that could be used to update these overall results, though any difference would not be expected to be large, and the priority for such an update would not seem to be very high.

The Panel report (page 31) suggests that such calculations need to take account of a rather larger number of factors that might play some role (such as those listed in the Panel's (a) to (d)). However given that

[2] Based on the scientific knowledge on minke whale distribution around Japan, estimated sampling efforts given the available research vessels (see Annex 21 of the proposed proposal) and the allocation of efforts to the two target species, annual sample size of 107 for minke whales was found to be optimal and feasible.

simpler considerations and computations of this bounding and illustrative nature are sufficient to address the basic question at issue here, there does not seem to be any particular need for such further complexity.

The Panel also comments that 'the proposed SCAA approach [of the Appendix to Annex 12] is not able to detect a change in recruitment [after 10 years] even after 50 years, *i.e. well beyond the project* timeframe of 12 years' (page 30). The first part of this comment is incorrect; notable improvement is evident after 20 years (i.e. within 10 years of the assumed change). But the implied lack of relevance because of detection after the end of the project timeframe must also be questioned on an in-principle basis (as it was earlier in Annex D). Given the relatively slow dynamics of minke whales, coupled to the nature of the information content of age data, the improvements to *IST*s achieved by use of these data take time to reveal their full extent, so that there is a need to show results for projections over a number of decades. Self-evidently the results for these larger numbers of years must be taken into account; otherwise the injudicious situation would arise that research with longer term benefits would never commence because those benefits could never become evident in the short term.

In summary the proponents consider that the Panel views were unfortunately rendered inappropriate through being grounded in too narrow an interpretation of what RMP improvement entails, and run counter to the general accepted wisdom in fisheries management regarding the utility of age data; and further that the computations already presented by the proponents are sufficient to indicate that (age) samples of the size proposed are sufficient to result in meaningful improvement in the detection of minke whale recruitment changes.

- *For the area north of Hokkaido (sub-area 11), the sample size (47) was selected to estimate the J-O mixing proportion in this sub-area annually with a standard error of no more than 0.1 irrespective of the true proportion. The Panel agrees that the technical approach adopted to compute the sample size is justified and accounts for both overdispersion and the probability of not assigning animals to J- or O-stock for the period from May to September. The proposed sampling scheme will allow J-O mixing proportions to be estimated for May-September. The months with low current sample sizes are April and September-November and thus the Panel concludes additional samples will not inform mixing proportions for the most data-poor months. The sample sizes are computed under the assumption that each annual estimate has a standard deviation of 0.1 or less. However, lower sample sizes would be needed if data were pooled over multiple years. (pp 31)*

Comment/response:
The proponents would like to clarify that April and September-November are not the most data poor months (see Table 7 of Morning Paper, 1 February 2017-Annex D). As the Panel pointed out, lower sample sizes would be needed if data were pooled over multiple years, but the idea here is to be able to estimate the proportion of J-stock annually in the future.

2.6 Evaluation of the sample size (sei whale)

- *As noted earlier, the Panel did not see a clear link between the ability to estimate natural mortality and improvements in the conservation and management of sei whales. For example, if there was a relationship between natural mortality and MSYR, improvements in the estimate of natural mortality would lead to a reduction in the range for MSYR that needs to be considered in the in-depth assessment and subsequently in Implementation Simulation Trials. However, no such relationship is suggested by the analyses in Annex 17.*

  The Panel notes that even with the proponents' assumptions, the calculated sample size was underestimated because the analyses ignored the effects of age-reading error and age-readability, both of which will reduce the information content of the age data; such analyses must be updated to account for both of these source uncertainty. In addition, the SCAA was provided with information about MSYR and MSYL, which would not be available in reality. It is likely that attempting to estimate MSYR simultaneously with natural mortality would lead to

imprecise estimates of both quantities, while setting MSYR to an incorrect value will lead to biased estimates for natural mortality. However, this needs verification.

The Panel notes that estimates of natural mortality are biased even at large annual sample size. This is probably due to the historical age-composition data (for which sample sizes are high) not being consistent with the values for natural mortality applied during the period of NEWREP-NP. Downweighting the historical age-composition data might reduce the conflict between the historical and simulated future data, but could also lead to less precise estimates of model outputs, including natural mortality. The Panel recommends conducting analyses in which the historical age-composition data are downweighted by various levels (pp 32).

(Recommendation 13)

Comment/response:
The proponents agree with the comments on the possible effects of age-reading error on the sample size and will provide a revised sample size based on that. However, the proponents have assumed an age-independent age-readability of 70% and accounted for its age-dependency in the age-dependent selectivity functions; therefore the impact on the sample size is likely to be quite small compared to that of the age-reading error even if taken into account.

The proponents agree that the simultaneous estimation of the natural mortality and MSYR would contribute to the management of whales if feasible and precise. However, such estimates tend to have a large variance. Given this situation, the SC usually fixes the value of MSYR at certain levels for the RMP/*ISTs*. The simulation conducted by the proponents followed this conventional procedure in the SC, so there is no doubt that the approach itself is logical.

The proponents share a concern that a non-negligible negative bias in M remains for the true value of M=0.07 even when the sample size increases. This might be due to the high value of M in the simulation; the existing data themselves seem to favor to a smaller value of M. Therefore, the proponents prefer not to downweight the historical age-composition data; rather they are considering re-conditioning with smaller values of M inferred from existing data via a profile likelihood function to be more appropriate. This modification is influential not only to the sample size calculation in addition to the age-reading error, but also to the effect of catches on stocks. The results will be presented in the revised proposal, which will be submitted at the 2017 IWC SC annual meeting.

2.7 Feasibility of non-lethal alternatives to either replace or reduce the size of proposed lethal sampling

- *The proponents concluded that in addition to the size and behaviour of the animals, the main technical cause of failure was the current barbed steel biopsy tip, which often failed to retrieve a skin biopsy at a successful hit; the Panel suggests that too short barbs could be the cause. The Panel reiterates its recommendation under Item 3.3.4 that the proponents undertake a fully resourced experiment to assess the efficacy of undertaking biopsy sampling of common minke whales as soon as possible, co-operating with outside experts and with clear milestones and quantitative criteria to ensure a timely completion of the feasibility study. The Panel recommends the implementation of biopsy sampling to reduce the lethal sample size as soon as it is deemed feasible rather than wait until the mid-term review (pp 32-33).*

(Recommendation 14)

Comment/response:
The proponents consider that the main cause of failure of biopsy sampling of common minke whales under JARPNII (2014-2016) is the small body size as well the fast swimming speed of the common minke whale and that the technical problems with biopsy equipment are a part of, but not the main, problem.

Attention is drawn to Section 1.3 regarding the proponent's views in relation to future biopsy experiments of common minke whale under the NEWREP-NP, and the failure by the Panel to consider important

information that the proponents had reported to the Panel in Annex D on this point. Please see also the proponents' comments to Recommendation 21 below.

- *The Panel reiterates that the key 'performance' parameter to assess in terms of the suitability in methylation-based ageing may not be whether methylation-based ageing achieves a comparable level of precision to earplug-based ageing, but rather whether or not the observed level of precision in ages inferred from methylation is sufficient for meeting conservation and management objectives requiring age data. Initial analyses to compare the estimation performance of an SCAA approach that uses age data was conducted in SC/65b/SP10. That analysis showed that the CV of recruitment was appreciably higher when ages were determined using the methylation approach compared to reading of ear plugs. To date, those analyses have not considered how such imprecision impacts management performance (e.g. how much poorer a CLA that uses age data would perform given age data from earplug readings compared to the methylation approach).*

  The above discussion does not negate the need to properly quantify the level of improvement that might be expected in RMP performance if age data (from any source) are incorporated (see Item 5.2) (pp 34). (**Recommendation 19**)

Comment/response:
As explained in more detail (and elaborated by a specific example) under section 2.5, improved estimates of recruitment are important for whale stock conservation and management objectives. Kitakado (2016) has shown that hardly any improvement in that respect (compared to the case of no age data) was achieved given the level of error associated with methylation-based ageing, in contrast to the substantial improvement that followed given earplug-based readings and their error levels.

However the proponents will consider the technical suggestions by the Panel and will implement these suggestions in a work plan independent of the current DNA methylation working plan for Antarctic minke whale.

- *An important component of determining appropriateness is determination of sample size – as non-lethal techniques become appropriate, non-lethal and lethal sample sizes will need to be recalculated to ensure that objectives are met. The Panel noted there was no discussion in the proposal as to what the strategy would be to determine sample sizes or how the current methods that determine sample sizes might be modified to determine the new sample sizes. The Panel recommends that this issue is considered by the proponents and a strategy to be included in the project proposal before the start of the fieldwork (pp 35).* (**Recommendation 21**)

Comment/response:
The proponents agree with the recommendation conceptually, and they presented their initial idea during the review workshop. During the preparation for the presentation, however, they recognized a serious technical difficulty in materializing the concept into concrete protocols that the development of the strategy/protocol to modify the lethal sample sizes at this stage would risk the strategy being very vague or too general, and conditional on many assumptions, thereby making it unreliable and uninformative.

Given that additional feasibility studies on non-lethal techniques will be conducted during the first six years of NEWREP-NP, the proponents consider that a more concrete and useful strategy can be developed once the results of such additional studies become available. In particular, this appears the only sensible strategy in circumstances where the availability of age data is fundamental to the success of the program, and at this time there is no indication of a viable non-lethal technique to provide ageing of adequate precision becoming available in the immediate future.

- *The Panel **stresses** that the extensive number of samples and genetic data already available should be used to the fullest extent to guide the sampling design as well as genetic data and analyses in order to address the NEWREP-NP objectives in an efficient manner. The current genetic data could serve as a basis [by limiting the 'parameter space' to be explored] for*

conducting simulations aimed at evaluating the possible benefits of genotyping additional microsatellite loci and/or large number of SNP loci and different analytical approaches (see Hoban et al. 2012 for a comprehensive review). Such an assessment will reveal the extent of the potential of additional genetic analyses of existing samples. This kind of assessment will also provide insights into how many more samples are required and from which areas. It is possible that the additional sampling in the current plans only will add marginally to the current available data/samples, hence alleviating the need for additional lethal sampling in terms of the genetic analyses. Consequently, the Panel ***strongly recommends*** *that the Proponents take full advantage of existing materials and data to assess the necessity of the planned efforts (in terms of numbers, timing and geographical areas) under NEWREP-NP to further resolve the current stock structure hypotheses in the targeted species before collecting additional samples (pp 35).*

(**Recommendation 22**)

Comment/response:
The proponents refer to the explanation of the scope of Secondary Objective I (iii) under Section 2.1 above that the genetics work proposed is simply routine monitoring to check for no future change in a current position that is already clear, and is proposed only because genetics information also becomes available, incidental to the necessary collection of future age data under the program. In this regard the original research proposal stated that '…..genetic analyses are possible based on tissues obtained by biopsy samples (non-lethal) although the feasibility of biopsy sampling varies among whale species….Since age data are definitively required, and can be obtained only by lethal methods, genetic data become co-incidentally available from such samples….'. The proponents would like to clarify that the main justification for the lethal sampling is to obtain earplugs for age data, and this aim guides the survey procedure and design of NEWREP-NP.

Regarding the refinement of the kinship analysis, such analysis will be carried out using all available samples, including those existing samples from JARPN/JARPNII and bycatches.

2.8 Assessment of potential effect of catches (common minke whale)

- *The Panel has two major concerns with the approach used to assess the potential effects of catches for common minke whales as summarised below.*

(1) *The approaches taken are based on projecting an SCAA model forward (O-stock) and an age- and sex-structure HITTER model (J-stock). However, the Scientific Committee and past expert panels have recommended that the impact of catches on stocks be based on trial framework (not the CLA) developed for RMP Implementations when these are available (e.g. IWC, 2010). The projections should be based on the anticipated Scientific Permit catches as well as any projected other human-caused removals (e.g. by-catches). In the case of common minke whales, use of the trials structure on which the 2013 Implementation was based would account for uncertainty regarding future by-catch and also assume that the amount of by-catch is related to population size rather than being assumed to be constant.*

(2) *The results are based on the assumption that there is a single J-stock and a single O-stock (Stock Hypothesis A). However, the 2013 Implementation considered scenarios in which there is a Y-stock in the Yellow Sea (Stock Hypothesis Y) and in which there are two J-stocks and two O-stocks (Stock Hypothesis C). The proponents consider Stock Hypothesis C to be implausible, but nevertheless Secondary Objective I(iii) involves investigating the likelihood of two O-stocks, which suggests that the proponents consider the possibility of there being two O-stocks is not fully resolved.*

The Panel notes that stock size is projected to decline even under the optimistic situation of a single J-stock when $MSYR_{mat}=1\%$ - due primarily to bycatch. Population size is projected to be reduced further (by 20% in approximately 2030 if catches of 47 continue to be taken). While this reduction is probably overestimated owing to assuming $MSYR_{mat}=1\%$ rather than $MSYR_{1+}=1\%$ and assuming that bycatch will remain at current levels, any further reduction of J-stock is of concern.

The Panel recommends that the assessment of the effects of catches on stocks be based on a subset of the trials on which the 2013 Implementation was based (including two levels for MSYR and all three stock hypotheses) as this will better account for uncertainty regarding current abundance and future bycatch, as well as time-variation in the J-O mixing proportion. The trials will also be able to account for the location (sub-area) and timing (month) of future catches. However, the trials on which the 2013 Implementation was based consider $MSYR_{mat}$=1%, whereas the Scientific Committee has agreed that the lower bound for MSYR should be $MSYR_{1+}$=1% (IWC, 2014). Furthermore, those trials did not use the most recent estimates of abundance. Thus, before a full consideration of the effects of the catches can be concluded, the Panel recommends that the proponents update the trials so that trials are conducted for $MSYR_{1+}$=1% and $MSYR_{mat}$=4% are fit to the most recent estimates of abundance. The Panel recognises that modifying trials is a substantial undertaking (and must be accompanied by evidence of satisfactory conditioning) and it may not be possible to update even a subset of the trials prior to the 2017 Annual Meeting. However, the Panel stresses the importance of this being completed before the programme commences (pp 35-36). (**Recommendations 23 and 24**)

Comment/response:
While sympathetic to the intent of the Panel regarding the use of *ISTs* to assess the effect of catches, the proponents must point out that this recommendation made by some previous Panels has not been accepted by the IWC SC, where the proponents have opposed it for practical reasons, including those elaborated below.

The proponents consider Stock Hypothesis C to be implausible for reasons given in the original proposal. We understand the apparent inconsistency of this view with Secondary Objective I (iii), and will accordingly reword the revised proposal to make our position clear, which is that the further genetics work proposed is simply routine monitoring to check for no change in a current position that is already clear, and is proposed only because genetics information also becomes available, incidental to the necessary collection of future age data under the program. Nevertheless, in deference to the Panel, we plan to present some results of the effect of catches on stocks under Stock Hypothesis C.

The proponents concur with the Panel's view that the projection shown at the review workshop for the J-stock with MSYRmat=1% reflected inadequate conservation performance. However, the plausibility of this MSYR value has to be taken into account in reaching a final view of the importance or otherwise of this fact, and the proponents did offer qualitative arguments in their proposal in support of this value leading to results that were incompatible with available data. The proponents will present quantification of those arguments to the SC meeting to confirm the sound basis for their arguments on this point.

The proponents hold the view that requiring reconditioning by themselves of what are possibly the most complex multi-stock 'assessments' ever conducted in the IWC SC (or indeed any other RFMO SC) is simply not reasonable or realistic. The number of persons sufficiently familiar with these trials to be able to adjust them can be numbered on fewer than the fingers of one hand. Some of these persons (whom the proponents were advised by some members of the Panel to consult) responded by questioning the practicality of the proponents conducting the 'satisfactory conditioning' checks in a comparable way to the practice previously pursued, and also mentioned the difficulties which others would encounter if attempting to modify complex individually-developed coding. While we hope to be able to report some limited results for reconditioning a few *ISTs* to no more than alternative values of MSYR to the IWC SC meeting, we cannot accept the Panel's recommendation to impose on us requirements that were neither clear nor accepted by the SC beforehand, especially given the practical difficulties to which they give rise. While the proponents remain committed to explain and to be accountable to the Scientific Committee and to the Review Panel with a view to presenting reasonable grounds that the program is 'for purposes of scientific research', it is the proponents' strong view that recommendations from the Review Panel and the Scientific Committee in the review process under Paragraph 30 of the Schedule and Annex P should also be reasonable within their roles, and should not be used as vehicles to set the bar so high at a level that would effectively prohibit any Contracting Governments with sound scientific question for examination from being able to implement scientific research under Article VIII of the Convention.

2.9 Assessment of potential effect of catches (sei whale)

- *The Panel agrees that approach on which the evaluation of the effects of catches for North Pacific sei whales was based was largely appropriate. However, the analysis is based on the (single) best estimate of abundance and $MSYR_{1+}$ values of 1% and 4%. The Panel recommends that the proponents consider additional analyses in which current abundance is assumed to equal to the lower 95% confidence bound for the current estimate of abundance and present results for $MSYR_{1+}$=1% and $MSYR_{mat}$=4%, as these are the values selected by the Scientific Committee (IWC, 2014) (pp 36).* (**Recommendation 25**)

Comment/response:
The proponents concur with this recommendation and will present the results in a revised version of the research proposal.

2.10 Logistics and project management

- *The proponents recognised the need for a backup contingency plan in the event of disruption of the programme. The primary contingency is for the cruise leader to adjust sampling efforts and locations, if necessary, for example due to bad weather preventing the collection of data in a certain location. The Panel agrees that contingency plans are needed, but noted that the proponents have not yet developed a more detailed plan/protocol, a priori, for how research will be modified in the event of disruption (pp 37).* (**Recommendation 29**)

Comment/response:
Reaction to disruption of the program, such as the suspension of field research due to bad weather, inevitably requires a case-by-case decision making. For example, in the North Pacific Ocean, typhoons frequently pass through the survey area, but how to adjust field surveys depends on, *inter alia*, the predicted route and the magnitude of the typhoon. A detailed procedure to deal with disruptions, which sacrifices flexibility, is not appropriate as a contingency plan. While noting this intrinsic difficulty in elaborating a contingency plan, the proponents nevertheless believe that developing some principles on this matter is possible, and these will be reflected in the revised research plan.

2.11 General comments on process and Annex P

- *However, the Panel wishes the Scientific Committee to clarify the purpose of the Expert Panel review process to avoid any misunderstandings. During the course of the workshop, the Panel received the (perhaps mistaken) impression that the Proponents perceived the Expert Panel review as an intermediate step before a final evaluation by the Scientific Committee. Whether the impression was incorrect or not, the Panel stresses that it believes it's role is to review a final proposal (or final documents for a periodic or final review). Indeed, this is the reason for the Panel's report to be transmitted to the Commission untouched. This is not to say that the Proponents should not take into account Panel recommendations and respond to them by the Scientific Committee meeting – as indeed is envisaged in Annex P – but that the Proponents should be submitting to the Panel what they believe to be the final, fully justified proposal (or reports that contain full analyses of all data).*

  Whilst the Panel is pleased that Governments are prepared to revise their proposals where problems are detected, it does not believe that it is appropriate for a Panel to receive, as has sometimes happened, responses to questions along the lines that there had not been time for particular information to be prepared for the Panel, but that it would be provided for the next meeting of the Scientific Committee.

  In short, the Panel reiterates its view that expert workshops are meant to undertake a thorough review of a final proposal (or a mid-term or final report). The Panel recommends that the

Scientific Committee considers revising Annex P to provide the necessary clarity on this, in order to help future reviews.

In addition to the recommendations on final reviews provided under Item 5.1, the Panel also recommends that the Scientific Committee develops general guidelines/frameworks, which could be appended to Annex P for the following:

(1) quantifying any likely improvements in conservation and management postulated for particular special permit objectives in an IWC/RMP context (e.g. using the RMP simulation trial framework under different data assumptions and scenarios to examine different catch performance statistics for the same conservation performance);
(2) assessing the impact of the effects of special permit catches upon stocks, for situations for which there has or has not been an RMP Implementation (and see Item 4.5); and
(3) evaluating the feasibility and practicability of non-lethal techniques (and see Item 5.4) (pp 38).

Comment/response:
The Panel's general comments in this section seem to be based on a misunderstanding. The proponents wish to clarify that they share the Panel's view and interpretation of the Panel's role. The misunderstanding seems to have resulted from an unfortunate miscommunication of the proponents' intentions behind some expressions used during the review: for example, the proponents explained that the plan 'will be finalized' to convey that the 'proposed plan' will become the final 'plan' once the comments from the Panel and the IWC SC have been duly taken into account. This was nothing but a reflection of the proponents' willingness to take the comments of the Panel seriously and their readiness to make changes as necessary.

The research proposal submitted to the Panel was the proponents' best proposal and was put forward in the belief that it included sufficient information necessary for review following the newly introduced self-checklist.

There are two related issues the proponents would like to point out. First the proponents have always considered the information requested by and recommendations from the Panels to be useful. However it is natural in the scientific world to have different opinions on the priorities of the information requested or recommendations to address the objectives of the research. Second, there may be some occasions where some of the information requested by the Panel would require some time to prepare before it can be presented to the Panel, due to the type of information sought. In such occasions, the proponents consider that providing such information to the next IWC SC meeting with thoroughly prepared material is an appropriate way to proceed.

On the basis of the above, the proponents do not believe a revision of Annex P to address this point raised by the Panel to be necessary as there is already agreement about the purpose of the Expert Panel review process.

OVERALL REMARKS FROM THE PROPONENTS

The proponents consider that many of the suggestions and recommendations from the Panel are useful, and if appropriately implemented, they will contribute to improve the research plan of NEWREP-NP. On the other hand, as natural in the scientific world, the proponents have different views on some statements and conclusions of the Panel and also assign different priorities to the 29 recommendations provided by the Panel. The proponents will take those useful comments into account and provide additional information and explanations in response to the review Panel report of NEWREP-NP at the next annual meeting of the IWC SC.

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Appendix 1

List of recommendations from the report of the NEWREP-NP review workshop. The proponents agreed that many of the recommendations are useful and due consideration will be given when revising the research plan and/or will be implemented during the research. The proponents elaborate further on recommendations 1, 2, 6, 11, 13, 14, 15, 19, 21, 22, 23, 24, 25 and 29 in the main text of this document.

No.	Agenda item	Panel recommendations	Comment/timeline	Relevant to the justification of lethal sampling of NEWREP-NP	Proponents response
1	4.1.5	The Panel **recommends** that a more thorough quantitative review of the relative contribution of those data types that can only be obtained by lethal sampling to the ability of the proponents to meet their primary objectives is warranted for a full evaluation of options in terms of lethal vs non-lethal methods in relation to the objectives (see also Item 4.2);	Required for any revised proposal	Yes	Already responded for A. minke whale
2	4.1.5	The Panel **recommends** that any Special Permit programme should include a specific Primary Objective to continually review new techniques as these become available to facilitate discussions of methods and samples sizes at milestones such as the mid-term reviews. *If* present data do not allow for this, a focussed pilot study to enable a full and proper evaluation of lethal vs present non-lethal methods integrated across objectives should be undertaken, prior the full programme starting; where such data already exist then the desktop-study evaluation should be undertaken *before* the permit programme begins. Such evaluations could be undertaken in light of an expanded framework as recommended under Item 3.3.4 and must be properly designed to enable more effective reviews of sample sizes/methods during mid-term reviews.	Whilst relevant to the proponents, this is directed primarily at the Scientific Committee and linked to Recommendation 19	No (generic matter directed to the SC)	NA
3	4.2.1	*Sexual maturity:* The Panel **recommends** that levels of progesterone in blubber and serum should be compared with sexual maturity and reproductive status of examined females. This comparison is valuable for assessing the efficacy of biopsy sampling for assessing reproductive status.	Add to the research protocols for any revised proposal	No (related to analyses rather than sample size calculation or sampling design)	Will be duly considered in revising the proposal
4	4.2.1 and 4.3.2	*Sightings surveys*: The Panel highlighted several issues that must be considered when designing line transect surveys that are expected to provide abundance information to address multiple objectives. The Panel **recommends** that these issues related to survey design, data collection protocols and priorities, data analyses and coordination are included in the plans to be submitted to the Scientific Committee for approval, before the surveys start. The main additional issues that should be covered in the proposals for surveys submitted to the Scientific Committee are: (a) **Evaluation of past surveys' analytical difficulties**. These new surveys provide an important opportunity to evaluate and potentially add/modify the variables or values of variables that are collected. Evaluating the shortcomings of previous surveys (for example, sample size issues and the amount of effort expended, problems that arose in analyses of past data) could suggest ways to supplement the future surveys. (b) **Appropriate temporal stratification** of the surveys. (c) **Appropriate direction of travel** for the survey vessel(s) and direction of track lines	Address in individual survey plans submitted to the Scientific Committee	No (related to sighting surveys)	Will be duly considered in revising the proposal

		to account for migrating animals. (d) **Use of independent observer (IO) mode,** especially in the offshore waters where the weather and sea state conditions are poorer. (e) **Use of passive independent observer mode** with abeam closing to get the benefits of estimating g(0) and also improving the precision of the group sizes. (f) **Development of protocols/priorities for biopsy-related activities**. (g) **Evaluation of additional variance analysis and spatial model methods** to determine which is preferred or whether both methods are investigated. (h) **'Regime shift'-related aspects** require that consideration should be given to whether sampling of prey is possible during the line transect surveys - obtaining simultaneously collected prey and whale data seems ideal, however logistically challenging			
5	4.2.5	Care is required during sub-sampling of prey in whale stomachs to ensure that the sample is representative when stomach volumes are large and prey diverse; the Panel **recommends** that the proponents specify how this is to be achieved in the field protocols.	Add to the research protocols for any revised proposal	No (related to field protocol rather than sample size calculation and sampling design)	Will be duly considered in revising the proposal
6	4.2.5	To demonstrate the feasibility of meeting the Secondary Objective related to regime shift, the Panel **recommends** that the proponents specify more fully: (a) quantitative criteria with respect to identifying [major] environmental change and potential responses by whales; (b) the adequacy of the methods and effort to specify the distribution, seasonality, and precision of the environmental data, for the regions in which the whales being studied are feeding; (c) taking into account uncertainty, conduct a power analysis to determine the sample sizes/effort for the characterisation of the environment and whales (including distribution and prey use) needed to determine if there are changes before and after a major environmental change occurred, should one occur during the programme.	Required for any revised proposal if the proponents wish to continue with this Secondary Objective for either or both species	No (objective related to regime shift is not the basis of the design of lethal sampling)	To be treated as ancillary objective
7	4.2.11	In order to achieve aim of research item (i) the Panel **recommends** that any immune function assays used should be those already established for cetaceans (e.g. Schwacke *et al*., 2012) so that the results are comparable to published studies.	Add to the research protocols for any revised proposal	No (related to analyses rather than sample size calculation or sampling design)	Will be duly considered in revising the proposal
8	4.2.11	Following previous expert panel recommendations, the Panel **strongly reiterates** that all lipophilic compounds being measured must be reported on a lipid weight and not a wet weight basis.	Add to the research protocols for any revised proposal	No (related to field protocol rather than sample size calculation and sampling design)	Will be duly consideredin revising the proposal
9	4.2.11	Research item (iii) relates to novel compound exposure and indicates that the levels of polybrominated diphenyl ethers (PBDEs) and other flame retardants would be quantified in blubber, prey and marine debris (presumably micro- and macro-plastics found in whale stomachs). However, there is no indication of how these results would be related to 'adverse effects' as stated in the objective. The Panel therefore **recommends** an integration and combined	Recommendation for analyses of results relevant for any mid-term review	No (related to analyses rather than sample size calculation or sampling design)	Will be duly considered in revising the proposal

		analysis of the results obtained by all three research items (i.e. relating exposure to polychlorinated biphenyls, flame retardants and novel compounds from plastics to responses) such as immune function and enzyme induction, including controlling for any effects of age (emphasizing the need to use the age estimates obtained from the earplugs rather than body length) and nutritional condition. This would require samples from the same individuals to be included in each of the three research items.			
10	4.2.12	The Panel **recommends** coordination with IWC-POWER with respect to sightings surveys, biopsy sampling and photo-ID for large whales to ensure consistent data collection and processing, as appropriate. The Panel also **recommends** information on these species are included in annual reports to the Scientific Committee to encourage collaboration with scientists involved with research on these two species.	Preparation for sightings surveys and presentation of results	No (related to field protocol of non-lethal techniques)	Will be duly consideredin revising the proposal
11	4.3.1	*Coastal component*: The Panel **recommends** that analyses be conducted, before the start of the programme, to assess the extent of loss in power and precision due to the sampling strategy for the objectives related to common minke whales and the implications for meeting Secondary Objectives. The experience/data gained from JARPNII should be used by the proponents to investigate issues (a) – (c) below: (a) the design would lead to oversampling of the areas close to ports (the Panel was informed that an additional land-based station may be established in the northern Sanriku to better cover sub-areas 7CS and 7CN); (b) the boats can search freely once they reach 30 n.miles from port if no whales have been encountered *en route* from port, which means the design is not fully specified in terms of the catches by the port-based boats; and (c) (c) the Nisshin Maru will conduct sampling if the number of common minke whales caught does not reach the target number, but no sampling plan for this contingency is provided.	Add to the research protocols for any revised proposal	Yes	Disagree with Panel (see main text)
12	4.3.1	*Offshore component*: During the workshop, the proponents provided the Panel with the sampling strategy (samples by month, year, and sub-area) and the Panel **recommends** that this information be included in the version of the proposal that is provided to the Scientific Committee. The Panel also **recommends** that tables of past samples in the same format as the new samples should be included in a revised proposal to place the new samples in a spatio-temporal context.	Required for any revised proposal	No (related to data archiving and compilation)	Will be duly consideredin revising the proposal
13	4.4.2	The Panel **recommends** conducting analyses in which the historical age-composition data are downweighted by various levels.	Required for any revised proposal	Yes	Disagree with Panel (see main text)
14	4.4.3.2	The Panel **recommends** the implementation of biopsy sampling to reduce the lethal sample size as soon as it is deemed feasible rather than wait until the mid-term review.	As soon as feasible	No (Related to future consideration of non-lethal techniques)	Disagree with Panel (see main text)
15	4.4.3.2 and 4.6.2	Given the discussion under Item 3.3.4, the Panel **recommends** that a properly designed experiment to assess the efficiency of biopsy sampling of common minke whales be undertaken (there is already sufficient detail on catch to render additional capture experiments unnecessary). This should incorporate at least: (a) the use of the expected vessels in the	High priority to begin as soon as possible this year	No (related to the design of the experiments of biopsy sampling)	Disagree with Panel (see main text)

		programme (i.e. the small type whaling vessels); (b) the use of vessels (that may be different from the expected vessels) considered suitable by scientists already experienced with biopsy sampling this species; (c) suitable levels of effort to allow a statistical comparison (effort for biopsy sampling should be measured or converted to the same units used for examining catching efficiency); (d) effort should be carried out in various environmental conditions (e.g. sea state, swell, visibility) up to the maximum conditions that would apply to whaling; (e) advice and training from invited experienced minke whale biopsy samplers (e.g. Christian Ramp or Lars Kleivane); (f) analyses that provide a proper comparison of biopsy sampling and catching (including time to process samples under various variables such as experience of sampler, vessel, equipment, effort under similar conditions). The Panel **reiterates** its comments that the proponents must (a) ensure that data are promptly analysed to ensure a meaningful mid-term review – it also refers to its comments about providing adequate resources into work on common minke whale biopsy sampling as soon as possible to facilitate the prompt use of non-lethal techniques.			
16	4.4.3.2	The Panel **recommends** the proponents attend the IWC-ONR joint Workshop on Tag Development, Follow-Up Studies and Best Practices to be held in September 2017 in Silver Spring, MD (USA) to become acquainted with the most current tagging technologies and deployment methods.	September 2017	No (related to tagging)	Will be duly considered in revising the proposal
17	4.4.3.2	Rather than set an arbitrary number of telemetry tags for deployment, the Panel **recommends** that the number, location and timing of tag deployments should reflect the questions being addressed.	Add to protocols for any revised proposal	No (related to tagging)	Will be duly considered in revising the proposal
18	4.4.3.2	Once a suitable tag is developed, the Panel **recommends** tagging North Pacific common minke whales within the study area to address stock structuring within the NEWREP-NP study region. Again, tag deployment location and tag design should be tailored to the question being addressed.	As soon as practical	No (related to tagging)	Will be duly consideredin revising the proposal
19	4.4.3.2	The Panel **recommends** using the extensive amount of data in age-related methylation in mammal model species (e.g. humans) where thousands of CpG sites have been identified in which the level of methylation correlates with age, similar to the approach taken by Polanowski *et al.* (2014) who assessed 37 CpG sites originally identified in humans. Once putative aging CpG sites have been identified among the candidate CpG sites observed in humans, a more targeted approach may be developed by identifying the homologous loci in the minke whale genome, thereby presumably increasing the precision of methylation-based aging in North Pacific minke whales. This work should be undertaken in the context of whether the technique shows a suitable level of precision for meeting conservation and management objectives requiring age data, not whether it achieves a comparable level of precision to ear plug readings.	Can start with existing data	No (though may become relevant to future sample size reconsideration)	Disagree partially with Panel (see main text)
20	4.4.3.2	The Panel **recommends** that the similar data/results from the Icelandic sampling programme are incorporated in the analyses. The Panel **reiterates** that non-lethal techniques should be incorporated into the		No (advise to analyses; related to future	Will be duly considered in revising

		programme as soon as they are deemed plausible		consideration of non-lethal techniques)	the proposal
21	4.4.3.2	*Sample size (potential reduction of lethal sample size)*: An important component of determining appropriateness of techniques is determination of sample size - as non-lethal techniques become appropriate, non-lethal and lethal sample sizes will need to be recalculated to ensure that objectives are met. The Panel noted there was no discussion in the proposal as to what the strategy would be to determine sample sizes or how the current methods that determine sample sizes might be modified to determine the new sample sizes. The Panel **recommends** this issue be considered by the proponents and a strategy to be included in the project proposal before the start of the fieldwork.	Required for any revised proposal	No (related to future consideration of sample size)	Agree with the Panel in principle but see explanation in main text
22	4.4.3.2	*Sample size (in general)*: The Panel **strongly recommends** that the Proponents take full advantage of existing materials and data to assess the suitability of the planned efforts under NEWREP-NP to resolve the current stock structure hypotheses in the targeted species, before collecting more samples. Simulation studies based upon data collected from the current samples are recommended to adjust the experimental design to address the targeted levels of population divergence/heterogeneity. Such simulations may reveal that an increase in data from existing samples may prove beneficial over collecting additional samples.	Required for any revised proposal	No (genetic information is not the basis of sample size and sampling design)	Disagree with Panel (see main text)
23	4.5.1.2	In relation to the impact of catches on common minke whales, the Panel **recommends** that the assessment of the effects of catches on stocks be based on a subset of the trials on which the 2013 *Implementation* was based (including two levels for MSYR and all three stock hypotheses) as this will better account for uncertainty regarding current abundance and future bycatch, as well as time-variation in the J-O mixing proportion. The trials will also be able to account for the location (sub-area) and timing (month) of future catches. However, the trials on which the 2013 *Implementation* was based consider $MSYR_{mat}$=1%, whereas the Scientific Committee has agreed that the lower bound for MSYR should be $MSYR_{1+}$=1% (IWC, 2014).	Required for any revised proposal	Yes	Partially agree with Panel (see the main text)
24	4.5.1.2	Furthermore, the analyses for common minke whales did not use the most recent estimates of abundance. Thus, before a full consideration of the effects of the catches can be concluded, the Panel **recommends** that the proponents update the trials so that trials are conducted for $MSYR_{1+}$=1% and $MSYR_{mat}$=4% are fit to the most recent estimates of abundance. The Panel **recognises** that modifying trials is a substantial undertaking (and must be accompanied by evidence of satisfactory conditioning) and it may not be possible to update even a subset of the trials prior to the 2017 Annual Meeting. However, the Panel it **stresses** the importance of this being completed before the programme commences.	Required for any revised proposal	Yes	Disagree with Panel (see main text)
25	4.5.2.2	In relation to North Pacific sei whales, the Panel **recommends** that the proponents consider additional analyses in which current abundance is assumed to equal to the lower 95% confidence bound for the current estimate of abundance and present results for $MSYR_{1+}$=1% and $MSYR_{mat}$=4%, as these are the values selected by the Scientific Committee (IWC, 2014).	Required for any revised proposal	Yes	Will be duly considered in revising the proposal
26	4.6.2	The Panel **recommends** that the proponents collaborate with wildlife immunologists and immunotoxicologists to assist them as optimising, validating and interpreting the results from any immune assays requires specialist skill and	Prior to undertaking the immune function analyses	No (related to research collaboration)	Will be duly considered in revising the proposal

		knowledge; it is **not** a trivial undertaking.			
27	4.6.2	Although a new graduate analyst has been appointed, the Panel **remains concerned**, that as has been the case for all previous special permit programmes undertaken by Japan, field and laboratory work and laboratory analyses have been allocated much higher priority than analyses and modelling. This has been reflected in the long times taken to complete analyses (some of which remain incomplete). The Panel **strongly recommends** the recruitment of sufficient highly trained and qualified analyst/modellers to improve NEWREP-NP study design, data analysis and review.	Prior to undertaking the programme	No (related to recruitment of analysts of Japanese research institute)	Will be duly consideredin revising the proposal
28	4.6.2	Additional information on sample and data archiving, relational database(s) as noted by previous expert panels would be welcome.	Include as part of any revised proposal	No (related to data archiving)	Will be duly considered in revising the proposal
29	4.6.2	The proponents recognised the need for a backup contingency plan in the event of disruption of the programme. The primary contingency is for the cruise leader to adjust sampling efforts and locations, if necessary, for example due to bad weather preventing the collection of data in a certain location. The Panel **agrees** that contingency plans are needed, but noted that the proponents have not yet developed a more detailed plan/protocol, *a priori*, for how research will be modified in the event of disruption. It **recommends** that this be done.	Add to protocols for any revised proposal	No (related to contingency plan rather than sample size or sampling design)	Will be duly considered in revising the proposal