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Annex U: Matters related to discussions of the
Final Review of JARPN II

International Whaling Commission

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Annex U

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ANNEX U1. OBSERVATIONS ON THE FINAL REVIEW OF JARPN II

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Ecosystem Objectives

We note that, in its response to the recommendations of SC/65b in relation to JARPN II, the proponents state (SC/66a/SP10):

> *The first objective of JARPN II is to reveal prey consumption and preference by cetaceans and to establish ecosystem models taking into consideration feeding ecology of cetaceans and other marine species in the western North Pacific. Collecting information about feeding ecology of cetaceans and integrating this into comprehensive ecosystem models can play a central role in achieving the aim of this research program.*

However, in relation to 'Objective 1: Feeding ecology and ecosystem studies ', the JARPN II Expert Panel in 2016 concluded that:

> *The Panel concludes that at this stage of development, the modelling results are not suitable for addressing strategic management questions. At present, at least, the results have not led to improved conservation and management of cetaceans or of other marine living resources or the ecosystem.*

Building various ecosystem models is not an objective in itself; models must be for defined purposes and selected to be fit for them. To this we add that some modelling should precede data collection and then be a continuously refined process thereafter, particularly in deciding which information has substantial influence on the purpose that the model is to serve. This is consistent with the 2009 panel recommendation that 'the models developed should be used to identify the areas of uncertainty with the greatest impact on model outputs of relevance to management, and hence guide the prioritisation of future data collection '. JARPN II has not adequately pursued this aspect of model development.

Objective 2: Monitoring Environmental Pollutants in Cetaceans and the Marine Ecosystem

The Panel summarises:

However, the Panel concludes that only partial progress has been made towards addressing the objectives and more effort needs to be put on improved analyses and interpretation of results (see discussion and recommendations under Item 8.4). This is especially true in terms of the relationship of pollutants and cetacean health, which is most relevant to improved conservation and management of cetaceans. It is not clear from the papers presented if (and if so how) the work undertaken has contributed to the conservation of other marine resources or the ecosystem.

In the mid-term review (IWC, 2010) the panel recommended that studies should include a '… *risk assessment statement, summarising the potential risk from exposure to the various pollutants, based on current toxicology data in model species and other wildlife in terms of the health of the animals and dynamics of the stocks* ' . None of the three papers presented to the review followed up this recommendation to any substantial extent.

Objective 3: Stock Structure of Large Whales

The Panel did make some recommendations for improved analyses, particularly related to power and the ability to distinguish amongst weakly-differentiated populations. The Panel concludes that the stock structure component of JARPN II has made, and will continue to make, important contributions to the conservation and management of cetaceans by providing fundamental data and analyses for the RMP Implementation Reviews of common minke whales and Bryde's whales, and the in-depth assessment of sei whales.

However, this work has relied primarily on genetic analyses, the samples for which can be collected non-lethally (as demonstrated in SC/66b/SP08). The lack of genetic samples from breeding grounds remains an important gap. Genetic analyses are of limited utility in answering the management question of the regions within which the mixing of whales is sufficient to avoid differential depletion if commercial whaling were to resume. This question can be addressed directly by non-lethal satellite tagging and close kin genetics could be useful here (which can also be addressed non-lethally).

Sample sizes and their relation to non-lethal methods

Concerning proposed and realised sample sizes for JARPN II, the 2016 Expert Panel agreed with the 2009 Panel assessment that insufficient justification for sample sizes for achieving program objectives had been provided, and that Japan had again failed in the 2016 review to provide any justification for sample sizes. The 2016 Expert Panel provided the following advice:

> '*The Panel recommends that a single document be provided to the 2016 Annual Meeting that:*

(1) *provides a clearer rationale for the changes in sample sizes and any implications for meeting the original objectives of the programme (e.g. related to time series of data, analyses and sample size); and,*

(2) *provides the field and analytical protocols for the comparison of using lethal and non-lethal techniques for each key parameter taking into account the advice provided in 2009.'*

In response to 1), Japan has provided no additional documentation that justifies the rationale for varying samples sizes, or how those variations to sample size impact on stated research objectives. Instead, the proponents have provided pointers to various previous documents or statements in which sample sizes are discussed. Of these referenced sources, the only substantial calculation of sample sizes was provided in SC/66a/SP10. However, in relation to SC/66a/SP10 the SC stated:

> *In conclusion, the Committee thanked Japan for providing the additional information provided in SC/66a/SP10 and 11. However, the Committee was **unable to reach consensus** on whether the additional information was sufficient to justify the revised number of whales to be taken under the JARPN II programme. It noted that consideration of the effects of this reduced sample size would be considered at the proposed expert panel meeting in early 2016. The Committee **agrees** to keep this matter on its agenda.*   SC66a (p80)

Clearly, the Expert Panel in 2016 had available to it the advice of the SC (above) when it recommended that the proponents provide additional justification in relation to how samples sizes were set and varied. It therefore seems incongruous that the proponents, in responding to the Expert Panel's request, would provide as its primary justification for sample sizes a document that the SC did not agree on in 2015. In summary, justification for JARPN II sample sizes and their variation remains elusive in the seven years since the JARPN II mid-term review, and remains so in SC/66b.

In response to (2), the proponents have indicated that a final comparison between lethal and non-lethal sampling methods, and how these results may impact sample sizes for lethal take, will not be provided until the 2017 SC meeting. This suggests that the final review of JARPN II has been premature.

We therefore conclude:

1. This programme has been terminated without achieving the objectives claimed to require lethal sampling.

2. Throughout this programme sample sizes have not been demonstrated as being necessary to achieve the objectives.

3. Attempts to assess the feasibility of adopting non-lethal methods to achieve its stated objectives are only being substantially addressed after the programme's final review.

ANNEX U2. A RESPONSE TO ANNEX U1 'OBSERVATIONS ON THE FINAL REVIEW OF JARPN II.' BY W. DE LA MARE, J. MCKINLAY AND M. DOUBLE

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Introduction
This paper responds to each of the comments made by de la Mare *et al*. in Annex U1. Texts from Annex U1 are reproduced here in *italics*, and the responses are given immediately below the text.

The authors note that most of the observations in Annex U1 are the same as those presented in a document to the JARPNII review workshop in February 2016 by the same authors (SC/F16/O1), which was already responded by the proponents (SC/F16/O2).

Responses
（1) Ecosystem Objectives

Building various ecosystem models is not an objective in itself; models must be for defined purposes and selected to be fit for them. To this we add that some modelling should precede data collection and then be a continuously refined process thereafter, particularly in deciding which information has substantial influence on the purpose that the model is to serve. This is consistent with the 2009 panel recommendation that 'the models developed should be used to identify the areas of uncertainty with the greatest impact on model outputs of relevance to management, and hence guide the prioritisation of future data collection '. JARPN II has not adequately pursued this aspect of model development.

Ecosystem modelling is one of most difficult tasks in fishery science because of its complexity of models and large uncertainties in data, processes, estimation and models themselves. A crucial part of the data employed in estimation of population dynamics is a set of abundance indices, and key uncertainties there are usually attributed to fishery operations and spatial and temporal variation in population distributions. In terms of linking predators and prey, predation mortality in prey dynamics and production rate converted energy intakes are key parameters in the models though inference of

those parameters are also basically influenced by the consumption data as well as the information on abundance as stated above. For designing the program, it could be worth conducting simulations before starting the program. However, the results from such exercises are greatly influenced by the values assumed for the parameters in the planned models, and those values influencing the results are usually most important parameters to be investigated in the program. Hence neither the data nor the models come first. Rather, these are supplemented each other in the necessarily iterative process of developing the model.

In fishery population management, the first thing to do is to conduct a stock assessment to know the population status and its likely prediction under certain levels of fishing intensity. Typically, given the updated population dynamics and its variants, better management procedures are investigated under the framework of Management Strategy Evaluation (MSE). However, as mentioned above, when taking into account the ecosystem perspective, we usually face with large amounts of uncertainties in various senses, and therefore careful consideration of such uncertainties is required in the MSE as well. Given this situation, we have not formally discussed the management action yet, but that does not necessarily mean that we will start only after completion of modelling.

As reflected above in our comments about data and modelling, we are busy with parallel initiatives for ecosystem modelling and seeking better management actions. In any case, as will become clearer from our presentations, the ecosystem modelling work to date (SC/F16/JR28 and JR29 – see also above) does indicate that consumption by whales could have an important impact on sustainable fishery yields, and thus merits further study.

(2) Objective 2: Monitoring Environmental Pollutants in Cetaceans and the Marine Ecosystem

In the mid-term review (IWC, 2010) the panel recommended that studies should include a '... risk assessment statement, summarising the potential risk from exposure to the various pollutants, based on current toxicology data in model species and other wildlife in terms of the health of the animals and dynamics of the stocks ' . None of the three papers presented to the review followed up this recommendation to any substantial extent.

The Expert Panel concluded the 'risk assessment issues ' had been addressed partly. The relationship between chemical pollutants and cetacean health was addressed in SC/F16/JR35 and SC/F16/JR36. However, we would like to reiterate that no signal of health risk due to pollutants, such as Hg and OCs, has been observed so far in whales taken during JARPN and JARPNII.

(3) Objective 3: Stock Structure of Large Whales

This work has relied primarily on genetic analyses, the samples for which can be collected non-lethally (as demonstrated in SP66b/SP08). The lack of genetic samples from breeding grounds remains an important gap. Genetic analyses are of limited utility in answering the management question of the regions within which the mixing of whales is sufficient to avoid differential depletion if commercial whaling were to resume. This question can be addressed directly by non-lethal satellite tagging and close kin genetics could be useful here (which can also be addressed non-lethally).

Genetics is an important approach in the studies of stock structure under the JARPNII but some questions are better addressed using a combination of genetic and non-genetic approaches. One example is the research on the pattern of movement and mixing of J and O stocks (Hatanaka and Miyashita, 1997). Some of those non-genetic approaches e.g. maturity stage, require lethal sampling. This is consistent with the conclusion of the IWC SC that the best way of investigating stock structure is by using several kinds of evidence, genetics and non-genetics (IWC, 2013).

Results of the SCAA-based analyses have emphasized the important role for these age data in revising the NP minke *IST*s (SC/F16/JR43), given that these go to the key issue of the plausibility or otherwise of the Ow stock hypothesis. For example, we confirmed that mainly young whales are distributed in coastal areas while basically only older animals are distributed in offshore areas. Such information cannot be obtained by the genetics. Age data can be obtained only by the lethal approach. Potentially age data can play an important role in the evaluation of plausibility of stock structure in the case of sei and Bryde's whales as well.

Regarding the feasibility of biopsy sampling for the target species for JARPNII, biopsy samples can be obtained from sei and Bryde's whale as shown in the IWC POWER surveys. Whether or not sufficient number of biopsy samples can be taken from sei, Bryde's and common minke whale in JARPNII remains in dispute.

Genetic samples from the breeding grounds would be useful. However decision on management under the RMP and AWMP have been completed successfully with only samples from feeding grounds and migratory corridor as in the case of NA minke, fin and BCB bowhead whales.

(4) Sample Sizes and their relation to non-lethal methods

Clearly, the Expert Panel in 2016 had available to it the advice of the SC (above) when it recommended that the proponents provide additional justification in relation to how samples sizes were set and varied. It therefore seems incongruous that the proponents, in responding to the Expert Panel's request, would provide as its primary justification for sample sizes a document that the SC did not agree on in 2015. In summary, justification for JARPN II sample sizes and their variation remains elusive in the seven years since the JARPN II mid-term review, and remains so in SC/66b.

The proponents are of the view that they have already provided clear rationales for the adjustment, and wish to reiterate that the rationales for the adjustment on sample sizes were provided at the 2015 SC (SC/66a/SP10) as well as the review panel meeting (SC/F16/JR54). Annex U1 fails to recognize the fact that the proponents, responding to the recommendation from the Expert Panel, provided clearer rationale for the changes in sample sizes and implications for meeting the objectives of the programme in SC/66b/SP01 (see footnote 1 and p3).

Sample sizes were calculated with a condition that the stomach contents of a target prey species be estimated with C.V. =0.2, for each year (SC/F16/JR54).

Basis of choosing of 0.2 for the CV is to ensure an appropriate precision for use of the results as inputs to multispecies models such as ECOPATH and MULTSPEC, following the same underlying basis and decision made in a Norwegian research proposal tabled at the IWC Scientific Committee in 1992 (SC/44/NAB18). SC/44/NAB18 describes this choice as 'reasonable '. The report of the discussion on this proposal in the Scientific Committee in 1992 (RIWC 43: 76-80) does not record any disagreement with the choice of the CV=0.2.

The proponents have indicated that a final comparison between lethal and non-lethal sampling methods, and how these results may impact sample sizes for lethal take, will not be provided until the 2017 SC meeting. This suggests that the final review of JARPN II has been premature.

Field and analytical protocols concerning the comparison of lethal and non-lethal techniques have been submitted to this meeting (SC66b/SP08). As agreed by the IWC SC last year (IWC, 2016 p78), information collected up to 2016 will be presented during the review of a new research program in the western North Pacific.

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