PEER REVIEW REPORT

Endangered Species Act Draft Status Review for Hector's Dolphin (*Cephalorhynchus hectori*)

Peer Reviewers:

- Dr. Paul Wade, National Marine Mammal Laboratory, National Marine Fisheries Service.
- Dr. Deanna Clement, Cawthron Institute, Nelson, New Zealand.
- Dr. Elizabeth Slooten, Zoology Department, Otago University, Dunedin, New Zealand.

Additional citations provided by peer reviewers:

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Turek, J., E. Slooten , S. Dawson, W. Rayment, and D. Turek. 2013. Distribution and abundance of Hector's dolphins off Otago, New Zealand. New Zealand Journal of Marine and Freshwater Research 47: 181-191 DOI:10.1080/00288330.2013.771687.

General Comments (*not associated with order of names as they appear above):*

Your report looks great. Below are some general comments. More detailed comments are in the document itself.

You have been cautious in comparing the most recent population surveys with previous ones. As you point out the most recent surveys went out to 20 nautical miles offshore, whereas the previous surveys went only to 4 nautical miles offshore and there are some differences in the methods used. For now, I have made some changes to the text and the summary table to further clarify this. The next step would be to make a comparison between the published estimates and the estimates from 0-4 nautical mile stratum in the most recent (still unpublished) surveys and to discuss some of the issues raised by the IWC and other peer reviews.

It would be worthwhile to discuss the two line transect abundance estimates in more detail.

You may prefer to use the common name "New Zealand dolphin" to refer to the species as a whole. Shorter and clearer than "South Island Hector's dolphin". The New Zealand sea lion likewise was called the Hooker's sea lion until about 10 years ago. Hector's dolphin is currently in this transition phase, with

the new name New Zealand dolphin or NZ dolphin replacing the name Hector's dolphin (which may remain in use for the South Island subspecies). For the endemic sea lion as well as the endemic dolphin, the intention is to use the country name to indicate they are only found in NZ. Also, the name Maui dolphin rather than Maui's dolphin has been suggested recently because the Maori language does not include an apostrophe.

Overall, the draft status review is well written, to the best of my knowledge covers the existing literature very well, and comes to sound conclusions based on the information at hand. The only area I had to pause and consider was the extinction risk conclusion for SI Hector's. There is plenty of published literature supporting the result that SI Hector's have declined and are likely to continue to decline, so moderate extinction risk is supported by that work. On the other hand, the new abundance estimates are fairly large and make one wonder about some of those results. I think that it is possible that future analyses might conclude that SI Hector's have low risk, based on higher estimates of abundance from recent surveys, but that is not certain, and will have to await future analyses.

The conclusion of high risk for Maui dolphin is well supported, and obvious.

You may know this already -- the only significant omission is the new survey results for the west coast of the South Island (Mckenzie and Clement 2016) – that paper may not have been available to you a few months ago. This means there is now a recent full survey of the South Island Hector's abundance.

The west coast estimate was actually similar to the previous estimate from a long time ago, so no big change, but nice to have a complete survey series from recent years. But that summary suggests a lack of decline in WCSI. And it is a bit perplexing that in the ECSI, where studies within smaller subareas suggest decline, the abundance estimate is now double, but as they say, that seems to be due to a much higher abundance in offshore waters than previously thought, in areas not surveyed previously.

Additional note: The aerial survey abundance estimates from MacKenzie and Clement (2014, 2015) have been reviewed by an expert group within the Small Cetacean subcommittee of the IWC. Here is the summary of the Intercessional Expert Group (IEG) in the Small Cetacean Subcommittee report from this year's meeting:

"The IEG recognized that this study accounted for many difficulties that also affect other small cetacean abundance estimation studies using aerial surveys. The authors addressed several difficult questions, including: how to develop a correction for availability; how to handle the fact that observers cannot easily see the track line; how to incorporate spatial-temporal changes in availability and detection; how to deal with the lack of complete independence between the two observation teams; and what scale is appropriate to display when developing distribution maps. Although these issues have been recognised in many studies, the theoretical and practical methods and guidelines to deal with them have not yet been fully developed. The IEG commended the ambitious and often innovative work undertaken by the authors to attempt to deal with all of those issues. After an in-depth review of the survey design, analyses and results, the IEG endorses the abundance estimates and concluded that the estimates accurately reflected the data, were derived from appropriate data collection and analysis methods, and represented the most current abundance estimates for Hector's dolphins around the South Island. Thus,

it follows that it would be reasonable to use them to inform a management plan. The IEG also considered this study to be a step forward in the development of survey methodology more generally. The IEG made a number of suggestions to refine the methods further (see Table 1 in the Appendix 2), including the collection of additional targeted data, additional sensitivity analyses regarding criteria used to make decisions, and the use of simulation and other ancillary studies."

Note also the full report of the IEG is Appendix 2 attached to the Small Cetacean Subcommittee report (pg 29).

Well done and nice job – a lot of information to work through and concisely summarise!
Almost all my comments are minor. There is perhaps some more 'grey' literature; i.e. student, DOC and client consulting reports, out there that might provide some more updated information on basic demographics, etc. But I don't think any of it is anything that will greatly alter any of the information already provided or change your general conclusions.

The only big omission, as you have already realised, is the new South Island population abundance and distribution estimates that were only just released in April 2016 (MacKenzie, D.I.; Clement, D.M. 2016. Abundance and distribution of WCSI Hector's dolphin. New Zealand Aquatic Environment and Biodiversity Report No. 168. 67 p + supplemental material).

In terms of possible implications on population modelling (growth, PBR, etc), by-catch risks and overall threats, those will all be re-worked and stepped through as part of the TMP review in the next year. Of up-most importance is the marrying of the most up-to-date fishing data with the Hector's abundance and distribution data (as recommended by Davies et al 2008) in all future management decisions around any regulations; and as you suggested in section 4.3.1.

Specific comments

Page 24. Abundance estimate of 55 for Maui dolphin from Hamner et al. 2012. That paper has now been published in a journal in 2014.

Page 57. Need to clarify description of effect of 0.1 recovery factor PBR.

"For example, when applying a recovery factor such that the population is allowed to increase each year, the PBR analysis suggests that…"

should be changed to something like

"For example, when applying a recovery factor such that population is expected to increase at a rate only slightly less than an up-perturbed population the PBR analysis suggests that...".

Conclusions on page 57 about modeling extrapolations are complicated by the new higher abundance estimates from MacKenzie and Clement (2014, 2015), as the modeling exercises were done with lower abundance estimates. The modeling work is not necessarily wrong, but might only apply to local nearshore areas, whereas it appears there may be a higher abundance offshore than previously

believed. This puts you in a bit of a bind in evaluating this actual situation for SI Hectors. What would really be needed would be new modeling efforts, using the higher abundance estimates.

Pg. 63. More of a semantic thing, genetic mark recapture estimates come from surveys. When you say "survey-derived", maybe you mean "latest visual survey abundance estimate"?

See draft status review report for additional specific comments.