Proposed process to facilitate a review by the Committee of 'Spatial Risk Assessment' of threats to Hector's and Maui dolphins'

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INTERNATIONAL
WHALING COMMISSION

PROJECT PROPOSAL REQUEST

1. PROPOSAL TITLE

Facilitation of a detailed review by the Committee of spatial risk assessment of threats to Hector's and Māui dolphins by Roberts et al. (2019).

2. BRIEF OVERVIEW OF THE PROPOSAL AND ITS EXPECTED OUTCOME

The task requested of the Committee is to review the spatial risk assessment of threats to Hector's and Māui dolphins (Roberts et al., 2019) with respect to its use for informing management measures to address anthropogenic threats to Hector's and Māui dolphin.

Roberts et al. presented estimates for

• Updated life history parameters for Hector's and Māui dolphins;

• Spatial distributions of Hector's and Māui dolphins, from spatial habitat models

• Spatially resolved commercial fisheries captures and deaths, using updated effort data and fisheries observer data

• The spatial intensity, and spatial overlap with dolphin subpopulations, of an array of potential threats, including fisheries related mortality and toxoplasmosis, and non-lethal threats such as underwater noise.

• Non-fishery causes of death in different subpopulations, from necropsy information

Specific topics related to each of these items were identified for the review based on discussions within the Committee in 2019. It is proposed that each of items numbered items 1-5 below could form the subject of short review papers by independent experts with the appropriate background.

3. RELEVANT IWC SCIENTIFIC COMMITTEE GROUPS OR SUB-GROUPS

List all the IWC Scientific Committee groups or sub-groups that the outcomes of this work would be relevant to and provide a brief (1-2 lines) explanation of how it would contribute more widely to their ongoing programmes of work. Where possible, do not simply list only the sub-committee within which or for which the project proposal was generated.

The primary relevance is to the HIM and SM subcommittees of the SC. But the work could also be relevant to the E Subcommittee with respect to toxoplasmosis.

4. TYPE OF PROJECT (PLEASE TICK)

Research project	
Modelling	
Workshop/meeting	**X**
Database creation/maintenance	
Compilation work/editing *(e.g. on whalewatching regulations, SOCER, etc.)*	

Other *(please specify below)*	**X**

Solicited review papers on five specific topics.

5. BRIEF DESCRIPTION OF THE PROPOSAL AND ITS CONNECTION WITH SCIENTIFIC COMMITTEE RECOMMENDATIONS (DO NOT EXCEED 1500 WORDS)

(A) BACKGROUND, RATIONALE, AND RELEVANCE TO THE PRIORITIES IDENTIFIED BY THE IWC SCIENTIFIC COMMITTEE:

Provide a clear explanation of the background and rationale for the proposal and its relevance to Scientific Committee identified priorities. Clearly identify the most relevant and recent Scientific Committee recommendations.

The intent of the proposal is to facilitate the review by the Committee at SC/67b through five solicited detailed reviews on different technical aspects of Roberts et al. 2019 followed by a two-day pre-meeting to consider these reviews. It is anticipated that this process will enable the Committee to provide a detailed evaluation to confirm whether the model of Roberts et al. 2019 is sufficiently robust to inform management.

The following topics (1-5) were agreed at SC68A for solicited review papers with subheadings to guide further consideration by the reviewers. Reviewers would consult with the steering committee if they planned to cover other issues within their terms of reference.

1. **Life history parameters**
   1.1. Review the estimates of r_{max} for both subspecies and the possible application of other approaches to this.

2. **Spatial distribution of Hector's and Māui dolphins**
   2.1. Review aspects of the spatial models, both for the model based on coastal aerial survey data and for the model based on harbour areas using public sightings, with respect to:
      2.1.1. Initial choice of static physical habitat variables
      2.1.2. Initial choice of dynamic habitat variables (sea surface characteristics and prey)
      2.1.3. Selection of dolphin occurrence data for fitting the model
      2.1.4. Model selection and fitting
      2.1.5. Combination of models for merging coastal and harbour predictions (Maui model only)
      2.1.6. Model validation and interpretation of results.

3. **Estimates of bycatch rates and vulnerability of Hector's and Māui dolphins**
   3.1. Review model parameters and choice of priors for bycatch risk model based on data from fisheries observers including:
      3.1.1. Selection of fisheries data for use in model (incl. choice of years)
      3.1.2. Selection of bycatch data for use in model
      3.1.3. Implications of level and spatial extent of observer coverage
      3.1.4. Implications of any bias in bycatch rate as a result of having an observer onboard
      3.1.5. Implication of vulnerability/catchability[1] not being constant across space and time
      3.1.6. Implication of assumption of Poisson distribution for bycatch compared to observed distribution of single and multiple captures
      3.1.7. Sensitivity of estimates of bycatch to choice of priors
   3.2. Model diagnostics and goodness of fit.

4. **Toxoplasmosis**

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[1] Vulnerability and catchability are used here as defined in Roberts et al (2019).

4.1. Review the estimation of spatial toxoplasmosis exposure
    4.1.1. Use of hydrological model
    4.1.2. Use of human habitation as a proxy for cat density
4.2. Review the use of beachcast necropsies as a means of estimating non-fishery deaths
    4.2.1. Potential sources of bias affecting carcass detectability (seasonal/ spatial/ factors affecting buoyancy)
    4.2.2. Implications of other evident patterns or biases for estimation of risk (sex or age bias, seasonal patterns)
    4.2.3. Compare toxoplasmosis exposure estimates with numbers of observed carcasses at the subpopulation scale, considering population size
4.3. Identify data or research priorities to improve understanding of toxoplasmosis risk

5. Risk model outputs

5.1. Review model predictions of spatially resolved bycatch compared to known records including beachcast carcasses and fisher-reported catches from vessels without observers
5.2. Compare estimates of commercial fisheries deaths from the spatially explicit model with comparable estimates from simpler models, including uncertainty
5.3. Explore the implications of model estimates for forward population trends
5.4. Explore the potential for, and implications of, backward extrapolation to inform estimation of population trends prior to fisheries closures, including varying assumptions about risk and onset of disease, e.g., toxoplasmosis

Based on these reviews there would be a two-day pre-meeting to SC68B to

(a) Evaluate the design and structure of the multi-threat risk assessment model

(b) Evaluate the overall sensitivity to model choices, data selection, uncertainties or potential biases identified in the review papers

(c) Make recommendations to reduce key uncertainties and improve the utility of the model to inform management decisions

(B) SPECIFIC OBJECTIVES OR ToR AND DELIVERABLES/OUTCOMES:

Provide the specific objectives and the expected deliverables. In the case of workshops and meetings, include the Terms of Reference (ToR) and expected outcomes.

The terms of reference are the preparation of solicited review papers on the information and analysis presented in Roberts et al. (2019) on:

a) Māui and Hector's dolphins' life history parameters;

b) Māui and Hector's dolphins' spatial distribution;

c) estimates of bycatch rates and vulnerability;

d) toxoplasmosis;

e) the risk model outputs;

Five independent experts with backgrounds appropriate to these areas would be identified by a Steering Committee to carry out the review. In order to ensure the independence of the review and its process, in both perception and reality, none of the identified experts or the members of the Steering Committee would be associated with Roberts et al. (2019), Cooke et al. (2019) or SC/68a/HIM/05.

The results of the independent reviews would be discussed in a two day pre-meeting to SC/68B. All conclusions would be presented to the Committee in SC/68B for further discussion, and any decisions with

regards to existing or future recommendations would be made at that time.

(C) METHODOLOGICAL APPROACH/WORK PLAN/ADMINISTRATIVE DETAILS

Specify the methods to be applied (novel methods require more explanation than standard ones) and the broad workplan – the detailed timetable appears under Item 5 below.

The results of the independent reviews would be discussed in a two day pre-meeting to SC/68B. All conclusions would be presented to the Committee in SC/68B for further discussion, and any decisions with regards to existing or future recommendations would be made at that time.

(D) SUGGESTIONS FOR OUTREACH

Please, note that successful proponents will be requested to produce ad hoc material that will be used by the IWC Secretariat for dissemination and outreach.

6. TIMETABLE FOR ACTIVITIES AND OUTPUTS

Specify the timetable for project activities and expected out puts separately. For projects with multiple distinct elements please indicate interim goals and timeframes. Add as many rows as you need to the tables below. If publications are an expected output please note whether you will submit the manuscript to the IWC's Journal of Cetacean Research and Management.

Activity to be undertaken	Key person(s)	Start(mm/yy)	Finish (mm/yy)
Establish steering group at SC67a			
Steering group identify possible reviewers, request a quote, and develop a budget for each review that fits within the total review budget		June 2019	Reviewers approached by end June 2019
Reviews returned to the steering committee at least 60 days prior to the pre-meeting.		August 2019	11 March 2020
Pre-meeting		9 May 2020	10 May 2020

Expected outputs	Completion date (mm/yy)
Full review at SC68b	

7. RESEARCHERS' (OR STEERING GROUP) NAME(S) AND AFFILIATION

Please, also specify if the project team has any direct connection (e.g. same research group or institute, collaborator on common project) with people involved or likely to be involved in taking the funding decision (e.g. IWC SC heads of delegations, SC convenors, etc.). Add as many rows as you need to the table below.

Name	Affiliation	Connection with decision
Robert Suydam (Convener)		SC Chair
Greg Donovan (Co-convener)		SC Head of Science
Alexandre Zerbini		SC Vice-chair
Russell Leaper		HIM Convener
Rohan Currey		HIM Co-convener
Lindsay Porter		SM Convener
Fernando Trujillo		SM Co-convener
Leslie New		WW Convener
Ailsa Hall		E Convener

8. TOTAL BUDGET

Breakdown into: (1) salaries/wages (include name/position of each individual and breakdown of time and duties i; (2) travel/subsistence expenses (breakdown by person and justification) unless for IPs for workshops where a total estimate based on an average for the total number of IPs is acceptable; (3) services (e.g. aircraft/vessel time, consultancy fees, ARGOS fees, etc.; (4) reusable capital equipment (e.g. reusable equipment such as a hydrophone, cameras, etc. Note that this equipment will have to be registered at the IWC Secretariat and will remain property of the IWC at the end of the project), (5) expendable capital equipment (e.g. consumables, tags, stationery), (6) shipping costs, (7) insurance costs, (8) in kind co-funding (specify whether other funding is available for personnel/name, equipment, venues, etc.). Note that "Overheads" are not admissible. Add as many rows as you need to the table below.

Type	Detailed description	Cost in GB pounds
(1) Salaries (by person)	Five reviewers, one for each of selected topics. Average of £8000 per review, but some will require more funding than others. This will be handled by the steering committee	£40,000
(2) Travel/subsistence (by person or est. total for IPs)	10 participants at £200 per person for two days Travel for five additional participants to SC	£4,000 £7,500
(3) Services (by item)	Venue cost	
(4) Reusable equipment		
(5) Consumables		
(6) Shipping (by Item)		
(7) Insurance (by item)		
(8) Co-funding		
(9) Other		
Total		£51,500

9. DATA ARCHIVING/SHARING

Please state your plans for data archiving and sharing. Note that data collected primarily under IWC grants are considered publicly available after an agreed period of time for publication of papers, usually about two years. The work of the IWC depends on the voluntary contribution of data to the various databases and catalogues IWC supports. Please consult the Secretariat (secretariat@iwc.int).

10. PERMITS (PLEASE TICK)

Do you have the necessary permits to carry out the field work and have animal welfare considerations been appropriately considered?	**NA**
Do you have the appropriate permits (e.g. CITES) for the import/export of any samples?	**NA**

If 'Yes' please provide further details and enclose copies where appropriate:

Appendix 2 – DRAFT SCORING SHEET

If a project presents multiple primary objectives which are achieved using sub-projects, a sheet should be used to evaluate each single sub-project. Note that not all criteria are equally applicable depending on the nature of the project (e.g. field work versus workshops).

IWC SCIENTIFIC COMMITTEE PROPOSALS FOR FUNDING - REVIEW CRITERIA - TEST			
TITLE OF THE PROJECT/sub-projects:			
PRINCIPAL INVESTIGATOR:			
Key criteria	**Explanation of scoring**	**Score**	**Supporting Remarks**
Relevance to Scientific Committee priorities			
1 How well aligned are the scientific outcomes of the project/activity with the current SC priority areas?	1 - Not aligned/poorly aligned (e.g. too vague or generic reference to general SC priorities) 2 - Reasonably aligned (e.g. some aspects may be vague or links are not clear) 3 - Well aligned (e.g. outcomes clearly deliver in the most part on priority areas, may also address longer term or potential future issues). 4 – Closely aligned (e.g. of interest for multiple sub-groups or delivers on specific SC high priority topics/recommendations in the immediate or short term).		
2 To what extent will the outcomes of the project/activity contribute to improvements in the conservation and management of cetaceans?	1 - Not at all 2 - Poorly 3 - Reasonably or over the longer term 4 - Well or over the medium term 5 - Excellently or to almost immediate effect		
Note: if in each of the two above key criteria under this section the project does not score singularly at least 2 points, do not proceed in further evaluation. Of course, proposals within a sub-group would only be developed if in their estimation scores were of 4 or above.			
Approach and methodology			
3 What degree of scientific merit/value is there in carrying out the work?	1 - Not demonstrated or of low scientific value 2 - Useful/basic scientific value 3 - Very good scientific value 4 - Excellent/innovative scientific value		
4 Is the proposed methodology scientifically sound and feasible in terms of field and analytical methods?	1 - Feasibility unrealistic & poor methodology or not properly addressed 2 - Feasibility & methodology acceptable but would benefit from some substantial amendments 3 - Feasibility & methodology good, some small changes beneficial 4 - Feasibility & methodology excellent or a highly promising		

		innovative approach to an important question facing the Committee		
5	What is the likelihood of success based on the proposed overall approach and methodology?	1 – No chance of success 2 - Low chance of success/better approaches available 3 - Medium chance of success/some changes to the approach necessary 4 - High chance of success/little or no changes to the approach necessary		
5a	Are objectives of the research likely to be achieved within the proposed time-frame?	1 – No or unlikely 2 – Partially or potentially ambitious 3 - Yes with some minor suggestions 4 – Yes		
5b	Are any proposed intermediary targets timely and achievable?	1 – No or unlikely 2 – Partially 3 - Probably 4 – Yes		
5c	Is the proposed time-frame/work necessary (e.g. can the project produce results in a shorter time period)?	1 – No or unlikely 2 – Partially 3 - Probably 4 – Yes		
5d	Is the sample size adequate to achieve the stated objectives?	1 – Not demonstrated/not properly addressed 2 – No or unlikely (too low/too high) 3 – Probably (additional analysis needed) 4 – Yes		
6	Is the project likely to affect adversely the population(s) involved?	1 - Not properly addressed/ unknown 2 - Yes severely 3 – Possibly at a low level 4 – No		
6a	**IF YES**, are analyses provided on simulations of the effects using different time-frames for the project if applicable?	1 – No 2 – Partially 3 – Yes		

Note: if in each of the above key criteria under this section the project does not score singularly at least 2 points, do not proceed in further evaluation. Of course, proposals within a sub-group would only be developed if in their estimation scores were of 3 or above.

Project team and Project management

7	To what extent does the team have the relevant expertise, experience, and balance?	1 – Poor or not demonstrated 2 – Sufficient 3 - Very good 4 – Excellent		
8	Contingency plan: To what extent have potential problems/risks been considered and	1 – Poor or not demonstrated 2 – Sufficient but could be improved		

	appropriate mitigation proposed?	3 - Fully or requiring only minor suggestions or not applicable		
Value for Money				
10	Does the project represent good value for money?	1 – No or significant amendments would be needed 2 – Yes but with some minor amendments 3 – Yes		
11	Have sufficient links been made to the wider research community/other organisations/capacity building.	1 – No 2 – Some but significant amendments needed 3 – Yes but with some minor additions 4 – Yes or not applicable		