

SC/68A/RP/06

---

ASI - Modelling/Computing (Palka/Smith)  
Simulating line transect data to investigate  
robustness of novel analysis methods



INTERNATIONAL  
WHALING COMMISSION



## PROJECT PROPOSAL REQUEST

### 1. PROPOSAL TITLE

Please provide the title of the project or the name of the workshop/meeting.

Simulating line transect data to investigate robustness of novel analysis methods

### 2. BRIEF OVERVIEW OF THE PROPOSAL AND ITS EXPECTED OUTCOME

Give a very brief overview (max 150 words) on your proposal and its expected outcomes. Use bullet point to list outcomes. Be succinct and clear as this may be used to summarise your project for the report.

The IWC SC has already invested time and money in developing simulated line transect data to evaluate the robustness of the Norwegian minke whale and Antarctic minke whale survey data. This proposal is to update the old code for the simulator to make it more user-friendly so that it can be made available to all SC members and to produce some standard data sets in accordance to the specifications of the ASI sub-committee.

### 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.

ASI is initializing this request to more completely and uniformly carry out its terms of reference to evaluate all needed abundance estimates. But just about all the sub-committees utilize abundance estimates so they would benefit from the outcome of this proposal.

### 4. TYPE OF PROJECT (PLEASE TICK)

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

**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 ASI Working Group formally reviews and agrees on the status of abundance estimates submitted to the SC. One issue that makes this task difficult is how to evaluate the robustness of novel estimation methods. In several cases the SC has used simulated data to evaluate novel analysis methods. This proposal is to update existing code that simulates line transect data so that the code is more accessible to SC members. It was also suggested by ASI to develop a library of datasets that novel methods could be evaluated with. The proposed updated simulator could be used to generate this library of datasets. It is also proposed that already existing simulated datasets will be evaluated as to whether they are appropriate to be used in the envisioned library of datasets.

As background, the code to create simulated data was lastly used to create sighting and effort data from surveys that were conducted in the Antarctic so the simulated study area was populated with animals that follow the general features of the distribution, density and behavior of Antarctic minke whales and the sighting surveys were similar to the IWC-IDCR-SOWER procedures. However, the program is sufficiently general to simulate line transect sightings and effort data resulting from a 1, 2, or 3 team line transect survey, where each team could have a different user-specified detection function that can be dependent on various factors, such as school size, Beaufort, and another unrecorded factor. The user can also specify the amount of time surveyed per day, the speed of the ship, and the amount of time spent in Closing and Passing mode. The spatial distribution and abundance of a target species can be pre-specified to allow spatial and temporal gradients, clustering of sightings clusters of group sizes, or any combination. Animal within groups had the ability to dive, swim, and move randomly or react to the ship. The school size distribution can be generated from either a theoretical Poisson distribution which could follow spatial gradients or from empirically measured dive sequences. In cases where school sizes are greater than one, all animals in a group could surface either simultaneously or in a non-synchronized fashion.

**(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.*

Deliverables would be the code to the simulator, document needed to use the code and some example datasets.

**(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.*

*In the case of workshops and meetings, include the broad work plan including any pre-requisites for the workshop/meeting to take place (apart from funding, e.g. completed analyses, papers etc.) and administrative details (e.g. location, dates, number of participants).*

Work plan is to evaluate and update the existing code, develop a user-friendly front end and associated user's manual. Also the existing datasets would be evaluated to determine if they are appropriate for the ASI library of datasets.

<b>(D) SUGGESTIONS FOR OUTREACH</b>
<p><i>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.</i></p> <p>Ad hoc material requested by the IWC Secretariat would be produced, as needed.</p>

## 6. TIMETABLE FOR ACTIVITIES AND OUTPUTS

*Specify the timetable for project activities and expected outputs 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)
Evaluate, update and document existing code for simulator and existing and new datasets	Smith/Palka	6/19	5/20

Expected outputs	Completion date (mm/yy)
Updated and available code of simulator and library of datasets	5/20

## 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
D. Palka	NOAA Fisheries Woods Hole, MA USA	
D. Smith	Integrated Statistics, Inc Woods Hole, MA USA	
Others in ASI		

## 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)	2-3 weeks of salary	3000
(2) Travel/subsistence (by person or est. total for IPs)		
(3) Services (by item)		
(4) Reusable equipment		
(5) Consumables		
(6) Shipping (by Item)		
(7) Insurance (by item)		
(8) Co-funding		
(9) Other		
<b>Total</b>		

## 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](mailto:secretariat@iwc.int)).

The code and new datasets would be archived with the Secretariat. The older datasets are already archived with the Secretariat.

## 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	
<i>Relevance to Scientific Committee priorities</i>				
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		
<b>Note:</b> 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.				
<i>Approach and methodology</i>				
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	<b>IF YES</b> , are analyses provided on simulations of the effects using different time-frames for the project if applicable?	1 - No 2 - Partially 3 - Yes		
<b>Note:</b> 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.				
<b>Project team and Project management</b>				



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 appropriate mitigation proposed?	1 – Poor or not demonstrated 2 – Sufficient but could be improved 3 - Fully or requiring only minor suggestions or not applicable		
<b>Value for Money</b>				
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		