SH - Assessing regional variation in Antarctic blue whale regional song calls from mid-latitude sites in the Southern Hemipshere

IWC

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PROJECT PROPOSAL REQUEST

1. PROPOSAL TITLE

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

Assessing regional variation in Antarctic blue whale regional song calls from mid-latitude sites in the Southern Hemisphere

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.

Here we aim to compare the characteristics (frequency, temporal) of Antarctic blue whale song calls from mid- and low-latitude regions in order to assess any regional variation in Antarctic blue whale song calls, with a view to contribute any information on Antarctic blue whale population structure.

Song calls will be compared from Australia, Chile, the Indian Ocean, New Zealand, South Africa. Subsets of High Signal-to-Noise ratio (SNR) calls will be selected from each site from existing annotated datasets. Intra-annual frequency decline in calls will be taken into account. These data will be contributed by collaborators on this project.

A detailed report for the Scientific Committee will be produced at the end of this study, which if considered appropriate by the group, will also be submitted for publication as a peer reviewed paper.

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.

- Antarctic Blue whale sub-group.

- SORP-IWC Blue and fin whale acoustic trends working group
(http://www.marinemammals.gov.au/sorp/antarctic-blue-whales-and-fin-whales-acoustic-program).

4. TYPE OF PROJECT (PLEASE TICK)

Research project	X
Modelling	
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.

It is widely recognized that there is a single song type for Antarctic blue whales (Širović et al., 2009), with no evidence for the degree of dialectical variation that is seen among songs of Southern Hemisphere non-Antarctic blue whale populations (McDonald et al., 2006, Sirovic et al., 2018). However there may be diagnostic differences within songs that are more subtle than the gross pattern distinctions between pygmy blue whale populations. To assess these distinctions, a quantitative comparison of Antarctic blue whale songs from different low-latitude regions would be required, which has been flagged by the Scientific Committee.

Passive Acoustic Monitoring (PAM) data which contain exemplars of Antarctic blue whale song calls are available from several mid-latitude sites off Australia, Chile, the Indian Ocean, New Zealand, South Africa (e.g. Buchan et al., 2018, Leroy et al., 2018). These data will be used to do a standardized analysis of Antarctic blue whale song call characteristics form these sites to assess any regional variation.

(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.

Objectives:
1) Measure the frequency and temporal characteristics of high SNR calls of Antarctic blue whales from mid-latitude sites.
2) Assess any regional variation in Antarctic blue whale regional song calls from mid-latitude sites.

Activities:
1) Contribution of data by collaborators. These data will be contributed as annotated datasets, ideally with high SNR calls previously identified
2) Compile data from mid-latitude study sites.
3) If the number of high SNR calls from each site is insufficient, additional automatic detection analysis will be carried out on subsamples of the data.
4) Define a standardized method for measuring SNR of calls and standardized metrics for measuring frequency and temporal call characteristics.
5) Measure the frequency and temporal characteristics of high SNR calls.
6) Compile results in table for IWC Scientific Committee Report (Deliverable).
7) Annotated datasets will be made available to the group (Deliverable).

(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.

Step 1: SNR measurement will be carried out in MATLAB (code contributed by Samaran et al.) or manually in Raven Pro, by measuring the dB of the target signal and the dB of immediately adjacent background noise. All calls above a threshold SNR will be included in the analysis.

Step 2: Frequency and temporal characteristics of selected calls (from Step 1) will be measured using the selection table functions in Raven Pro, which is widely used in the literature (e.g. Buchan et al., 2014). Other methods will also be considered upon discussion with the group.

Step 3: Statistical approaches may be used to compare call characteristics among sites.

Step 4: Data will be compiled in Table form, but also may be presented geographically as a map.

All the above methods will be agreed upon among the collaborators participating in this study.

(D) SUGGESTIONS FOR OUTREACH

Spectrograms and map showing possible regional variation can be contributed for outreach purposes.

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)
1. Contribution of data by collaborators.	Susannah Buchan, and all listed collaborators	July 2020	July 2020
2. Compile data	Maximiliano Vega	August 2020	August 2020
3. Additional automatic detection analysis	Maximiliano Vega	September 2020	October 2020
4. Define standardized methods	Susannah Buchan	July 2020	July 2020
5. Measure SNR, and frequency and temporal characteristics	Maximiliano Vega	August 2020	October 2020
6. Compile results and reporting	Susannah Buchan	November 2020	November 2020
7. Make annotated datasets available	Susannah Buchan & Maximiliano Vega	November 2020	November 2020

Expected outputs	Completion date (mm/yy)
Final Report	December 2020

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
Dr. Susannah Buchan	Centro de Estudios Avanzados en Zonas Áridas, Chile	none
Dr. Flore Samaran	ENSTA Bretagne, France	none
Dr. Fannie Shanbangu	Fisheries Management, Department of Environment, Forestry and Fisheries, Cape Town, South Africa	none
Dr. Leigh Torres	Oregon State University, USA	none
Dr. Brian Miller	AUstralian Antarctic Division, Australia	none
Dr. Salvatore Cerchio	Adjunct Scientist, Center for Coastal Studies	Part of IWC-SC sub-group
Dr. Ana Širović	Texas A&M University Galveston, USA	Part of IWC-SC sub-group

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)		
Susannah Buchan (PI)	1 month at 60% gross salary	1,500 GBP
Maximiliano Vega (analyst)	6 months at 50% gross salary	2,900 GBP
Total		4,400 GBP

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).

All annotated datasets included in the analysis will be made immediately available to members of the group. Datasets will be made publicly after two years to provide time for manuscript preparation.

10. PERMITS (PLEASE TICK)

Do you have the necessary permits to carry out the field work and have animal welfare considerations been appropriately considered?	Does not apply
Do you have the appropriate permits (e.g. CITES) for the import/export of any samples?	Does not apply

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

References:

Buchan, S. J., Hucke-Gaete, R., Rendell, L., i Stafford, K. M. (2014). «A new song recorded from blue whales in the Corcovado Gulf, Southern Chile, and an acoustic link to the Eastern Tropical Pacific», Endanger. Species Res., , doi: 10.3354/esr00566. doi:10.3354/esr00566

Buchan, S. J., Hucke-Gaete, R., Stafford, K. M., i Clark, C. W. (2018). «Occasional acoustic presence of Antarctic blue whales on a feeding ground in southern Chile», Mar. Mammal Sci., , doi: 10.1111/mms.12441. doi:10.1111/mms.12441

Leroy, E. C., Samaran, F., Stafford, K. M., Bonnel, J., i Royer, J. Y. (2018). «Broad-scale study of the seasonal and geographic occurrence of blue and fin whales in the Southern Indian Ocean», Endanger. Species Res., 37, 289-300. doi:10.3354/esr00927

McDonald, M., Mesnick, S., i Hildebrand, J. (2006). «Biogeographic characterization of blue whale song worldwide: Using song to identify population», J. Cetacean Res. Manag., 8, 1-18.

Širović A.., Branch, T. A., Brownell, R. L., Cerchio, S., Aimee, L., Buchan, S., Findlay, K., et al. (2018). «Blue whale song occurrence in the Southern Hemisphere. IWC»,.

Širović, A., Hildebrand, J. A., Wiggins, S. M., i Thiele, D. (2009). «Blue and fin whale acoustic presence around Antarctica during 2003 and 2004», Mar. Mammal Sci., 25, 125-136. doi:10.1111/j.1748-7692.2008.00239.x

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).

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 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 appropriate mitigation proposed?	1 – Poor or not demonstrated 2 – Sufficient but could be improved 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	