

## MMC Final Report Questionnaire

### **Passive Acoustic Monitoring of Marine Mammals in the Corcovado Gulf, Chile**

Alessandro Bocconcelli, Applied Ocean Physics and Engineering Department, WHOI

***What were the primary questions you were trying to address with this research? (Or, if more appropriate, was there a hypothesis or theory that you were trying to prove or disprove?)***

We tried to discover the critical habitat areas for blue and humpback whales in the Corcovado Gulf-Chiloense region, Patagonia, Chile. We were also trying to assess anthropogenic activity in these area, including aquaculture and inter-island boat traffic to support it (there are no local residents, thus crew and supplies must be continuously ferried from the main island of Chiloe’).

***What have you discovered or learned that you didn't know before you started this work?***

Several critical habitat areas for blue and humpback whales in the Corcovado Gulf were identified: the Moraleda Channel, the Guaitecas Islands, the Desertores Island and the southern portion of the Ancud gulf. In these remote locations both blue and humpback whales were sighted feeding close to each other for many days.

***What is the significance of your findings for others working in this field of inquiry and for the broader scientific community?***

Our findings show that the endangered blue whales are present in several places comprised in this wide area. The acoustic data collected may be valuable for policy decisions regarding ship traffic and management strategies for blue whale conservation in the Gulf of Corcovado and the Chiloense region.

***What is the significance of this research for society?***

Our research project established collaborations with local research group such as the MERI Foundation and Centro de Conservacion Cetacea. Our data will be used for policy decision to protect the endangered blue whales. We are also continuing the project with several scientists from WHOI and other research institutes.

***What were the most unusual or unexpected results and opportunities in this investigation?***

We discovered that the blue whales were highly mobile, switching from one feeding ground to the next depending on food availability. We also discovered that ship traffic during the summer is a potential danger for the blue whales feeding near the main navigation channels.

***What were the greatest challenges and difficulties?***

The weather in Patagonia can be brutal! Also there are no research vessels available (at least with our meager budget) so we operated from local fishing vessels with very limited “technology”!

***When and where was this investigation conducted? (For instance, did you conduct new field research, or was this a new analysis of existing data?)***

The investigation was conducted in 2014-15-16 and combined with other projects supported by MERI foundation. Thus we were able to use fixed mooring with passive acoustic recorders and also digital recording tags (DTAG) to tag and record the blue whale behavior and sounds.

***What were the key tools or instruments you used to conduct this research?***

We used passive acoustic recorders, shallow water surface moorings, WHOI custom digital recording tags (DTAG), plankton nets, fish finders and drones.

***Is this research part of a larger project or program?***

Yes, we are working with MERI foundation and Centro de Conservacion Cetacea to understand the Chilense region eco-system and assess the impact of salmon farming, commercial fishing and ship traffic.

***What are your next steps?***

We are planning a new research expedition for February-March 2018. We will collect more data using passive acoustics, DTAGs, drones, biopsies, prey mapping, and net tows.

***Have you published findings or web pages related to this research? Please provide a citation, reprint, and web link (when available).***

Produced a short documentary titled “Patagonia Azul” it was presented at the Woods Hole Film Festival in 2017 and won the 1<sup>st</sup> prize for short documentaries.

The MERI foundation website has pictures and shorts about our project,

<https://www.fundacionmeri.cl>

We have presented several posters at the European Cetacean Society (ECS) conferences, at the Society for Marine Mammology (SMM) biennial conferences and at the IMPAC 4 conference for Marine Protected Areas.

**Published papers:**

Saddler, M, **A. Bocconcelli**, L.S. Hickmott, G. Chiang, R. Landea, P. Bahamonde, G. Howes, P. Segre, and L. Sayigh (2017) Characterizing Chilean blue whale vocalizations with DTAGs: A test of using tag accelerometers for caller identification. *Journal of Experimental Biology*, 220(22), 4119-4129.

**Bocconcelli, A.**, L. Hickmott, G. Chiang, P. Dahamonde, G. Howes, R. Landea-Briones, F. Caruso, M. Saddler, and L. Sayigh (2016) DTAG studies of blue whales (*Balaenoptera musculus*) in the Gulf of Corcovado, Chile. *Proc. Mtgs. Acoust.* 27(1), doi: <http://dx.doi.org/10.1121/2.0000269>

**Bocconcelli, A.**, L. Hickmott, R. Landea Briones, G. Howes and L. Sayigh (2015) Blue whales (*Balaenoptera musculus*) in the Canal Moraleda and Golfo Corcovado, Chile. In: OCEANS 2015 – Genova, MTS/IEEE Conference and Exhibition Proceedings, Genova, Italy, 18-21 May, pp. 1-9.

*Please provide photographs, illustrations, tables/charts, and web links that can help illustrate your research.*

<http://www.fundacionmeri.cl>

<http://www.whoi.edu/website/marine-mammal-behavior-lab>

<http://goldbogen.stanford.edu/people/>

see attachments for photos, etc.