

SOCIETY FOR MARINE MAMMALOLOGY: SMALL GRANT IN AID OF RESEARCH (2019)

PROJECT TITLE: Distribution, ecology and abundance of cetaceans in the Southern Ocean

AWARDEE'S NAME: Maria Cecilia Passadore Real, PhD.

AWARDEE'S COUNTRY: Uruguay

GRANT REPORT (2019-2020)

Project aims:

Through international cooperation and using vessels as platforms of opportunity to collect cetacean data, this project aims to broaden the basic knowledge about the diversity, distribution patterns, ecology and abundance of cetaceans in the Southern Ocean, and eventually other ocean basins such as the southwestern Atlantic Ocean. The specific objectives of the project are to: 1) Analyze distribution and diversity patterns of cetaceans in relation to biotic and abiotic parameters in the Southern and Atlantic Oceans; 2) estimate the density and abundance of cetaceans in different zones of the Southern Ocean, including the vicinity of the Antarctic Peninsula, mainly the Straits of Bransfield and Gerlache, and east of this peninsula; and 3) generate cooperative bonds with different Antarctic researchers and programs to promote the use of multiple platforms of opportunity to maintain the systematic operation of the project in the long term.

Summary of methods and results of the austral summer campaign 2019/2020:

To collect data on distribution and diversity patterns of cetaceans, the *BIO Hespérides* was used as a platform of opportunity during the austral summer 2019/2020. Cetacean sighting data was registered in the waters of the Southwest Atlantic Ocean, while the vessel navigated between the ports of Montevideo (Uruguay) and Punta Arenas (Chile), following the pre-established route of the vessel. Observations of cetaceans were made from the high bridge (11 m high) following Distance Sampling line-transect methodology. Whenever environmental conditions were suitable for cetacean observation (during daylight hours with Visibility > 2mn and Beaufort Sea state ≤ 4) and while the vessel was moving at a speed greater than 8 knots, a team of four cetacean observers worked on a rotational basis every 30 minutes. On each shift, two observers scanned for cetaceans with the naked eye or using binoculars with reticles covering from the bow to 90 degrees on either side of the bow, one observer recorded the data and the fourth observer was at rest or available to make photographic records of the sightings. Every 30 minutes, we recorded environmental conditions and geographic position with handheld GPS. When a group of cetaceans was detected, the position was recorded, as well as the angular and horizontal distance of the sighting, species and group size; if possible, a photographic record was taken to corroborate the species and/or number of individuals.

The *BIO Hespérides* trip from Montevideo to Punta Arenas lasted 6 days, including 5 days that presented suitable conditions for cetacean sampling. A total of 43 hours and 29 minutes of effective cetacean survey effort were done, covering 446 nautical miles of linear transect over the continental shelf of the Southwest Atlantic Ocean. In total 57 cetacean sightings were recorded in which five species were identified: Southern Right whale (*Eubalaena australis*, n = 16), Sei whale (*Balaenoptera borealis*, n = 5), Common dolphin (*Delphinus* sp., n = 1), Peale's dolphin (*Lagenorhynchus australis*, n = 10) and Dusky

dolphin (*Lagenorhynchus obscurus*, n = 2); in addition, several groups of whales (n = 16) and dolphins (n = 7) that could not be identified to species level (Figure 1).



Figure 1. Photographic records groups of Southern Right whales (*Eubalaena australis*, top left), Peale's dolphin (*Lagenorhynchus australis*, top right), and Sei whale (*Balaenoptera borealis*, bottom) sighted during the austral summer campaign 2019/2020 in waters of the Southwestern Atlantic Ocean on board the *BIO Hespérides*.

Since during this campaign we could only follow one route pre-established by *BIO Hespérides* and not a systematic design, the data obtained will be used to contribute to the first objective of this project. The cetacean data obtained *in situ* during the campaign 2019/2020 and future campaigns in this area, will be complemented with habitat data obtained from satellite and bathymetric images for cetacean distribution and habitat use analysis. It is important to continue with long-term surveys in order to be able to generate and add information from subsequent years to achieve robust analyses of relatively unexplored areas.

Other activities done during the austral summer campaign 2019/2020:

Regarding human resources training, during the campaign conducted aboard the *BIO Hespérides*, two members of the Uruguayan team were trained in the standard distance sampling methodologies used in the framework of this project and Latin American research.

Furthermore, at the end of the campaign, a talk was given to the crew of the *BIO Hespérides* in which the objectives of the project, methodology and the preliminary results of the campaign were presented, as well as cues for cetacean identification.

Summary of the plans for austral summer 2020/2021 and further campaigns:

Due to the continuation of the covid-19 pandemic during the austral summer 2020/2021, it was not feasible to conduct cetacean surveys aboard any of the Antarctic Program vessels with which we tried to coordinate this year. However, this project will continue at least until the austral summer 2022/2023. Therefore, we expect to be able to conduct cetacean surveys in Antarctic waters, and eventually in the southwest Atlantic Ocean. Future surveys will be coordinated through the Uruguayan Antarctic Institute and the Directorate of Antarctic and South Atlantic Affairs of the Ministry of Foreign Affairs of Uruguay as for the campaign 2019/2020. Information on cetaceans in Antarctic waters must be updated and it is important to obtain it through these campaigns in order to contribute to the development of national and Latin American research. Therefore, conducting cetacean surveys in these waters represents a contribution to the development of research and contributes to decision-making by management agencies. It is expected that the results generated on board *BIO Hespérides* during December 2019, together with data collected throughout this project in future campaigns, will contribute to the monitoring of the different cetacean populations, improving the understanding of the effects of climate change on cetacean communities in particular, and the Antarctic ecosystem in general. Ultimately, it is intended to contribute with useful information for the prioritization of marine spatial conservation in Antarctica.

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