**SOCIETY FOR MARINE MAMMALOGY: SMALL GRANTS IN AID OF RESEARCH (2018) GRANT REPORT**

**Project title:** Reconstructing the historical feeding ecology of bottlenose dolphins from the Western South Atlantic through stable isotope analysis of archived samples

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**SUMMARY REPORT**

In the Western South Atlantic, the coastal bottlenose dolphin ecotype that inhabits inner shelf waters of southern Brazil, Uruguay and Argentina was recently recognized as a subspecies: the Lahille´s bottlenose dolphin (LBD - *Tursiops truncatus gephyreus*). Its coastal habits make it a species susceptible to anthropogenic impacts, mainly to the negative effects of interactions with fishing activities, such as the reduction of the availability of its prey. This bottlenose dolphin is considered an opportunistic predator that feeds primarily upon coastal and demersal teleost fishes. However, its feeding ecology has been mostly studied through stomach content analyses of a few stranded individuals. In order to evaluate historical changes in the diet and estimate the trophic ecology and habitat use of the LBD, analyses of stable isotopes of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) were carried out on bone samples from specimens deposited in museums and scientific collections from Brazil (BR, n=41), Uruguay (UY, n=31) and Argentina (ARG, n=32), belonging to periods I (1900-1950), II (1951-1980), III (1981-2000), and IV (2000-2017). Mean isotopic values were compared between regions and periods through two-way ANOVAs. Isotopic niche areas corrected for small sample were calculated for each area and period. Isotope mixing models were run in order to calculate the dietary proportions of the most important prey items for dolphins from UY and ARG (periods III and IV). The isotopic values of ARG dolphins were different from UY and BR in all periods studied, reflecting a probable variation in the composition of the diet or differences in the basal isotopic values between the areas. These differences coincide with the separation into Evolutionary Significant Units previously postulated based on genetic data. In ARG the considerably broad isotopic niche of the species shown in the samples collected in period I was replaced by a narrower niche, occupying only a portion of this primordial niche. In this area, the dolphin used to have a common presence throughout the northern region of the Argentine coast. Today, only a few

populations with a small number of individuals can be found in the southern part of the province of Buenos Aires and on the northern coast of Patagonia. The current LBD diet had a small change in the proportions of prey between periods III and IV in this area. In UY, fish such as *Trichiurus lepturus* and *Mugil liza* are the species that most contribute to the diet in the present (Period IV). However, other demersal species were also part of the diet during period III, but to a lesser extent than the main two. These changes may be due to the overexploitation of demersal prey as previously shown for the population of BR. The retrospective analysis of samples stored in scientific collections of the Lahille's bottlenose dolphin contributed to the knowledge of the ecological structure and feeding behavior of this poorly-known subspecies, currently considered as "Vulnerable" by the IUCN.

The received funds were used to pay for isotopic analysis of the bone samples as well as to buy laboratory supplies for processing them. This research is part of A. Campos-Rangel M.Sc. Dissertation in Biological Oceanography (Federal University of Rio Grande – FURG, Brazil) and a manuscript will be submitted for publication during March 2020.