

SC/68B/SM/10

Creation of a *Tursiops truncatus* *gephyreus* task team

Pedro F. Fruet, Els Vermeulen, Paula Laporta, Mark
Simmonds, Frank Cipriano, Mariano Coscarella,
Leonardo Berninsone, Fabio Daura-Jorge, Miguel
Iniguez



INTERNATIONAL
WHALING COMMISSION

Creation of a *Tursiops truncatus gephyreus* task team
Fruet, Vermeulen, Laporta, Simmonds, Cipriano, Coscarella, Berninsone, Daura-Jorge,
Iñíguez,

Corresponding Author: Pedro F. Fruet (pfruet@gmail.com)

INTRODUCTION

The coastal populations of bottlenose dolphins in the western South Atlantic (wSA) have recently been recognized as a distinct subspecies (Lahille's bottlenose dolphin - *T. t. gephyreus* Lahille, 1908) by the Society for Marine Mammalogy's Taxonomy Committee¹. This conclusion was described as "well supported by morphological and molecular genetic data, as well as ecological and distributional data" at the Subcommittee on Small Cetaceans (IWC/SC/SM) Tursiops Taxonomy Workshop in 2018². The potential for species-level designation (Wickert et al. 2016) awaits further analyses of nuclear data necessary to examine the possibility of introgression between the two forms, as was suggested by microsatellite data (Fruet *et al.* 2014). Following the taxonomic and population structure review, the Scientific Committee more recently considered the conservation status of the subspecies in the wSA (e.g. SC/66b/SM06; SC/66b/SM08; SC/66b/SM10; SC/66b/SM14; SC/67b/SM19; SC/67b/HIM/10). In addition to a restricted distribution within the inshore waters of Southern Brazil, Uruguay and Argentina, *T. t. gephyreus* has small and fragmented populations, which are exposed to a number of significant threats. In southern Brazil, for example, two small estuarine populations are subject to high levels of by-catch and have a high incidence of individuals with chronic dermatitis (van Bresse *et al.* 2015). Recent evidence suggests a progressive disappearance of the subspecies in the La Plata River estuary, especially from areas surrounding Montevideo, in Uruguay, and the Province of Buenos Aires, Argentina, where the species was once common (Vermeulen and Bräger 2015; Vermeulen *et al.* 2018). In Argentina, PVA simulations suggest a declining trend in the population residing in Bahía San Antonio (Vermeulen and Bräger 2015). Further south, in Chubut province, a similar decline was detected in a coastal population of fewer than 50 individuals (Coscarella *et al.* 2012). Although there is no abundance estimate available for the entire subspecies' range, mark-recapture studies conducted at several sites indicate very small local Management Units (< 100 individuals), with some exhibiting strong site fidelity and year-round residency (Fruet *et al.* 2014). The sum of the available abundance estimates suggests a maximum total population size of 600 individuals. With an estimated 60% of mature individuals, the total number of mature individuals in the species can be estimated at 360, well below the threshold to be listed as Vulnerable under criterion D1 (IUCN 2019). Therefore, the subspecies was classified as "vulnerable" by a recent IUCN Red List assessment (Vermeulen *et al.* 2019a).

CONSERVATION CONCERNS AND ACTIONS

The "Second International Workshop on Research and Conservation of Tursiops in the Southwest Atlantic Ocean" was held at the Atlântico Hotel, Cassino Beach, Rio Grande, Brazil, from 6 to 8 April 2017 (Fruet *et al.* 2018). The three-day workshop brought together 60 invited participants from Brazil, Uruguay and Argentina, including Msc and PhD students, post-docs, associated researchers and professors from South American Universities, plus researchers from local and international non-governmental organizations. The participants recognized the two main populations (or Evolutionarily Significant Units) proposed by Fruet *et al.* (2014): Southern Brazil-Uruguay (SB-U) and Argentina; and agreed that they are genetically and ecologically different. The possibility of a recent divergence was suggested because there was no evidence of morphological differentiation between SB-U and Argentina bottlenose dolphins despite remarkable disparities in molecular characters (mtDNA and nDNA) and

¹ <https://marinemammalscience.org/species-information/list-marine-mammal-species-subspecies/>

² J. CETACEAN RES. MANAGE. 20 (SUPPL.):523-546, 2019

ecology (stable isotopes). Workshop participants agreed that by-catch was still the main threat, especially within the Southern Brazil - Uruguay region, but lack of data still hamper an in-depth assessment of their regional conservation status. A high chance of population decline, due to the predicted small regional population size (see Fruet *et al.* 2016b) and the increasing incidence of mortality along their distribution was also noted. This mortality occurs especially in the main concentration areas (Laguna and Patos Lagoon Management Units) and the northern boundary of the subspecies' distribution, where strandings seem to be seasonal. By-catch was expected to increase as a consequence of the intensification and expansion of artisanal fishery effort in response to marine resource overexploitation in southern Brazil. The workshop also raised concerns regarding the negative effects of the overexploitation of coastal fish stocks. The 2017 workshop noted that since 2010, little progress had been made towards developing methods for health assessment of *T.t. gephyreus* specimens and no actions had been taken to reduce by-catch or other human-induced impacts on bottlenose dolphins along the wSA, with the exception of the implementation of a fishing exclusion area in Patos Lagoon Estuary Management Unit (INI12/2012), which prohibited fishers from operating gillnetting fisheries from boats in the core distribution area used by dolphins (Fruet *et al.* 2018).

In a recent study, Rigghetti *et al.* (2019) evaluated the POPs level in biopsy samples from resident individuals from Patos Lagoon Estuary and Laguna. The study reported that for almost all animals sampled the total polychlorinated biphenyl (Σ PCBs) levels were above the threshold level considered to have physiological effects and pose risks to cetaceans.

In Brazil, two additional regulations were adopted to reduce human-induced impacts in the Laguna population (Portaria N° 214/2019 and Municipal Law N° 1.998 of June 18, 2018), but due to the general lack of compliance, non-natural mortality is still a source of concern.

In Argentina, the National Action Plan to reduce interaction between marine mammals and fisheries (PAN MAMIFEROS 2015) - including *Tursiops* - was adopted in 2015.

In Uruguay, Lahille's bottlenose dolphin was been added to the Priority Conservation Species List elaborated by de National System of Protected Areas of the National Direction of Environment of the Ministry of Housing, land use and environment in 2013. The subspecies has also been considered as a conservation focal object in the Cerro Verde and Coronilla Islands protected area (Decret N°285/2011), one of the principal study areas of this subspecies in the country.

PREVIOUS SCIENTIFIC COMMITTEE RECOMMENDATIONS

At SC66B, the Scientific Committee recommended an updated assessment of the population status of Lahille's bottlenose dolphins populations in Argentina.

At SC67B, given the indications that the two small populations in southern Brazil are subject to high levels of by-catch and have a high incidence of individuals with chronic dermatitis, the Scientific Committee stated:

Attention: SC, CG-R

Given the small sizes of the two known populations of Lahille's bottlenose dolphins (*T. t. gephyreus*) in southern Brazil and the conservation concerns surrounding these populations (especially related to by-catch), the subcommittee:

Draws attention to range states (Argentina, Brazil, Uruguay) the conservation concerns for this entire subspecies;

Recommends immediate action to reduce the level of by-catch in the southern Brazil populations;

Recommends continued monitoring and photo-identification work on the populations throughout the subspecies' range to refine survival estimates and to assess trends in abundance and the prevalence and etiology of the chronic skin infections;

Recommends that the conservation status of the subspecies be prioritized for assessment in the future.

RECENT RESULTS

In 2018, SC/67B/SM/19 summarized the information on life-history parameters and threats faced by the two largest estuarine Management Units (MUs) of Lahille's bottlenose dolphins in southern Brazil: Patos Lagoon Estuary (PLE) and Laguna (LGN) populations. Both MUs have been the focus of long-term ecological studies and represent a good source of information on the conservation status of *Tursiops truncatus gephyreus*. Both MUs started to be monitored more than 30 years ago, with systematic efforts commencing in the mid-2000s. Monitoring consists of year-round mark-recapture and biopsy sampling efforts, and regular beach surveys in core areas to collect dolphin carcasses. Mark-recapture studies indicated that a large proportion of animals are year-round residents, and permanent emigration is unlikely. Population sizes are very small in both areas: around 87 dolphins in PLE and 64 in Laguna. Genetic studies found moderate genetic diversity for the mtDNA for PLE (three closely related haplotypes) and very low for LGN (only one haplotype), but nuclear DNA variation was very low for both populations, with signs of inbreeding for the Laguna population.

SC/67B/SM/19 reported moderate levels of persistent organic pollutants (POPs) and indicated that agricultural and industrial activities represent the sources of POPs in LGN and PLE, respectively. By-catch in coastal artisanal gillnet fisheries was cited as the main threat to both populations, and evidence of increasing rates of by-catch-related mortality in LGN in recent years was noted—by-catch rates were higher at PLE and surrounding areas, where it was responsible for at least 43% of the overall recorded mortality. Of additional concern is the chronic dermal infection in LGN, with evidence of an increase in the number of affected animals in recent years (current prevalence of 14%). Despite the evidence of increasing human-related mortality, the study found no evidence of a clear negative trend in abundance, but the authors cautioned that there is a high probability of population decline in the near future, due to the small population sizes and stochastic events, the high degree of residency, and the increasing incidence of mortality as a consequence of unregulated fisheries and other human activities in these areas.

SC/67B/HIM/10 presented preliminary evidence on the failure of the bottlenose dolphin protection area in southern Brazil in relation to by-catch reduction in Patos Lagoon Estuary and adjacent coastal areas (PLE). Article 8 of a norm that regulates gillnet fisheries in southern Brazil, established by the Brazilian Government in 2012 (INI12/2012), bans boat-gillnet fisheries in the core area of the Management Unit. Under a scenario of full compliance and effectiveness of the norm, a significant decrease in the stranding rates of bottlenose dolphins around PLE after its implementation (from 2013 onwards), and no significant seasonal pattern in mortality would be expected. However, the study showed that despite inter-annual variation over the 25 years of data, mortality remained high and with the same seasonal pattern after the implementation of the norm, coinciding with the artisanal fishery effort in the area. In addition, five cases of bottlenose dolphin entanglement by three different types of fisheries operating within the boundaries of the protected area were reported. These results suggest that the protected area for bottlenose dolphins in southern Brazil is not effective. The reasons for this may include: lack of compliance; failure to include beach seine and stake and cable set nets, which also incidentally catch bottlenose dolphins, in the regulations; and insufficient coverage of the no-take area.

Also, at SC/67b, Barreto presented additional results from beach monitoring at the northern limit of the subspecies distribution (where it co-occurs with the nominal subspecies). A total of 119 bottlenose dolphins strandings were recorded over two years. Evidence for entanglement was found in 66% of the specimens. As yet, there is no evidence on the subspecies identity of the specimens in question. Skulls and genetic samples are being analysed for this purpose.

Also, at SC/67b, Luna provided additional information on the norm that regulates gillnet fisheries in a wide area in the south and southeast Brazil (INI12/2012) and the different techniques that have been used to monitor its effectiveness. In some places, it was found that the new regulation has not effectively reduced the impact of fishing on some species (e.g., bottlenose dolphins in Patos Lagoon Estuary). The

Brazilian government is looking into this subject in order to reach a solution for these locations and species.

In April and May 2019, the first two records of Lahille's bottlenose dolphins with signs of bycatch in recreational/subsistence nets deployed from the beach in Valizas (Rocha Department, Uruguay) were reported. One of them was a juvenile individual (Laporta Unpub. data).

In 2018, the Scientific Committee welcomed the information provided and recommended that enforcement be increased, and to ban other fisheries inside the gillnet no-take zone to more effectively protect bottlenose dolphins from by-catch (Report of the Subcommittee on Small Cetaceans, Annex M, 2018). The Scientific Committee expressed concern that, given the relatively small population sizes and restricted ranges, these populations may be highly vulnerable to threats (Report of the Subcommittee on Small Cetaceans, Annex M, 2018). Due to the limitations on time and missing participants, *T. t. gephyreus* was not discussed at the 2019 SC meeting in Nairobi.

Current information on progress with previous recommendations made by the Scientific Committee are provided in a separate working paper. Overall, that working paper reports substantial progress made in actions taken to promote the conservation of Lahille's bottlenose dolphins in Brazil and Argentina, between 2018-2020. Lahille's bottlenose dolphins were classified as "Endangered" according to the last national assessment in both countries (Vermeulen *et al.* 2019b), following the IUCN Red List Criteria at regional level (IUCN 2012). In Brazil, three additional conservation actions deserve attention: i) Portaria 375/2019/MMA/ICMBio establishing the new National Action Plan (PAN) for the conservation of marine cetaceans (2019-2024), which included a set of specific actions for the conservation of Lahille's bottlenose dolphins along its Brazilian distribution; ii) Portaria N° 214/2019/IMA, establishing a specific Action Plan for Santa Catarina province for the conservation of the bottlenose dolphin population in Laguna; iii) Municipal Law N° 1.998 of June 18, 2018, which prohibits the use of gillnets in the core areas for Lahille's bottlenose dolphins in Laguna. In Argentina, the lack of data to update the current national population status of Lahille's bottlenose dolphins, as well as the lack of dedicated scientific research on the subspecies is still of concern.

In addition, a multi-institutional and transnational project was established in late 2018 in order to estimate population parameters for the Lahille's bottlenose dolphins in southern Brazil and Uruguay, within a metapopulation context. Furthermore, a study of the population ecology of Lahille's bottlenose dolphins in Bahía Blanca Estuary is about to commence. That area, in the southwest of Buenos Aires Province, is the only remaining locale with frequent occurrence of the subspecies where no scientific data is yet available. Finally, it is important to highlight the monitoring sampling programs that have started in areas where Lahille's bottlenose dolphins have been sighted: in the Golfo San Jorge (central Patagonia)—photo-identification and remote biopsy protocols—, and in Río Negro Estuary (northern Patagonia)—photo-identification and collection of samples from stranded individuals.

Finally, whistles repertoire of both subspecies of *Tursiops* were analyzed in a regional scale including Uruguay and multiple Brazilian localities (Lima *et al.* 2020).

RECOMMENDATION TO SET UP A TASK TEAM

Based on the above, it is believed that the development of a "*Tursiops truncatus gephyreus* Task Team" is now critically needed to help initiate, guide and coordinate 1) the implementation of conservation strategies set for the subpopulations in southern Brazil/Uruguay and 2) further research into the possible causes of the population declines in certain areas of Argentina and Uruguay. This would include, but not be limited to, full consideration, support and harmonization with existing agreements, strategies and activities developed under other fora, and ongoing initiatives at local levels. The Task Team would seek to bring together appropriate experts from range states and beyond to instigate specific targeted field investigations or conservation efforts, provide advice, and/or play a role in seeking appropriate (financial) support for priority activities, including the potential for the development of an IWC

conservation management plan (CMP). The Task Team would deliver regular updates on progress to the Scientific Committee.

The Task Team would support urgent efforts related to the conservation status of this subspecies, particularly those which refer to the need for improved coordination of efforts, including *inter alia*:

- a. A wide collaboration among national and international researchers
- b. The development of regional or sub-regional research projects and conservation plans
- c. Coordinated data collection and sharing
- d. International collaboration for funding and capacity building to support programs for monitoring, management and conservation of coastal marine living resources

LITERATURE CITED

- Coscarella, M. A., S. L. D. Dans, Mariana, G. Garaffo, and E. A. Crespo. 2012. Bottlenose dolphins at the southern extreme of the south-western Atlantic: local population decline? *Journal of the Marine Biological Association of the United Kingdom* 92: 1843-1849.
- Fruet PF, Secchi ER, Daura-Jorge FG, Vermeulen E, Flores PAC, Simões-Lopes PC, Genoves RC, Laporta P, Di Tullio JC, Freitas TRO, Dalla Rosa L, Valiati VH, Beheregaray LB, Möller LM (2014) Remarkably low genetic diversity and strong population structure in common bottlenose dolphins (*Tursiops truncatus*) from coastal waters of the Southwestern Atlantic Ocean. *Conservation Genetics* 15: 879 – 895.
- Fruet PF, Laporta P, Flores PA (2016) Report of the working group on population parameters and demography of *Tursiops truncatus* in the southwest Atlantic Ocean. *The Latin American Journal of Aquatic Mammals* 11(1-2): 71-78. <http://dx.doi.org/10.5597/lajam00217>
- Fruet, P.F., J.C. Di Tullio; S. Botta; R.C. Genoves; E.R. Secchi; R. Venuto; L. Dias; P. Laporta (2018) Summary Report of the "Second International Workshop on Research and Conservation of *Tursiops* in the Southwest Atlantic Ocean", 6 to 8 April 2017. Rio Grande, Brazil.
- IUCN (2019) Guidelines for Using the IUCN Red List Categories and Criteria. Version 14. Prepared by the Standards and Petitions Committee.
- IUCN (2012a) *Guidelines for Application of IUCN Red List Criteria at Regional and National Levels: Version 4.0*. Gland, Switzerland and Cambridge, UK: IUCN
- Lima IMS, Venuto R, Menchaca C, et al. (2020) Geographic variation in the whistles of bottlenose dolphins (*Tursiops* spp) in the southwestern Atlantic Ocean. *Marine Mammal Science*. <https://doi.org/10.1111/mms.12690>
- PAN MAMIFEROS 2015, Plan de Acción Nacional para reducir la interacción de mamíferos marinos con pesquerías en la República Argentina, 2015.
- Righetti BPH, Mattos JJ, Siebert MN, Daura-Jorge FG, Bezamat C, Fruet PF, Genoves RC, Taniguchi S, da Silva J, Montone RC, Simões-Lopes PCA, Bainy ACD & Lüchmann KH (2019) Biochemical and molecular biomarkers in integument biopsies of free- ranging coastal bottlenose dolphins from southern Brazil. *Chemosphere* 225: 139-149.
- Vermeulen, E and Bräger, S (2015) Demographics of the Disappearing Bottlenose Dolphin in Argentina: A Common Species on Its Way Out? *PLoS ONE* 10(3): e0119182. [doi:10.1371/journal.pone.0119182](https://doi.org/10.1371/journal.pone.0119182)
- Vermeulen E., Bastida R., Berninsone L.G., Bordino P., Failla M., Fruet P., Harris G., Iñíguez M., Marchesi M.C., Petracci P., Reyes L., Sironi M. and Bräger S (2018) A review on the distribution, abundance, residency, survival and population structure of coastal bottlenose dolphins in Argentina. *Latin American Journal of Aquatic Mammals* 12(1-2): 02-16. <https://doi.org/10.5597/lajam00233>.
- Vermeulen, E., Fruet, P., Costa, A., Coscarella, M. & Laporta, P. (2019a) *Tursiops truncatus* ssp. *gephyreus*. *The IUCN Red List of Threatened Species* 2019: e.T134822416A135190824. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T134822416A135190824.en>. [Downloaded on 11 March 2020.]
- Vermeulen, E., Failla, M., Loizaga de Castro, R., Romero, M. A., Svendsen, G., Coscarella, M. A., Cáceres-Saez, I., Bastida, R., Dassis, M. (2019b) *Tursiops truncatus*. Categorización 2019 de los

mamíferos de Argentina según su riesgo de extinción. Lista Roja de los mamíferos de Argentina.

Versión digital: <http://cma.sarem.org.ar>.

Van Bresselem MF, Simões-Lopes PC, Félix F, *et al.* (2015) Epidemiology of lobomycosis-like disease in bottlenose dolphins *Tursiops* spp. from South America and southern Africa. *Diseases of Aquatic Organisms* 117:59–75.

Wickert JC, von Eye SM, Oliveira LR and Moreno IB (2016) Revalidation of *Tursiops gephyreus* Lahille, 1908 (Cetartiodactyla: Delphinidae) from the southwestern Atlantic Ocean. *Journal of Mammalogy* 97(6): 1728-1737.