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Critically Endangered subpopulation of Irrawaddy dolphin in central Philippines may lose its habitat to large-scale development project

The Irrawaddy dolphin *Orcaella brevirostris* is a range-restricted, facultative freshwater species that inhabits coastal, estuarine and freshwater habitats in disjunct populations from India to South-east Asia. The Iloilo-Guimaras Straits subpopulation is one of three known *O. brevirostris* subpopulations in the Philippines and the second to be declared Critically Endangered (Dolar et al., 2018, [dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T123095978A123095988.en](https://doi.org/10.2305/IUCN.UK.2018-2.RLTS.T123095978A123095988.en)). This subpopulation of 13–25 individuals was discovered in 2007, and is believed to be in decline. This decline is likely to be exacerbated should the Philippine government pursue plans to construct the Panay–Guimaras–Negros bridges under their ‘Build, Build, Build’ agenda to boost interconnectivity for economic development.

A feasibility study of the proposed bridges stated that the construction phase would have few significant effects on the marine fauna. However, the proposed bridges will affect an Important Marine Mammal Area and the known range of this *O. brevirostris* subpopulation (Fig. 1). Specifically, the potential bridge alignment D directly bisects the species’ core

habitat (de la Paz et al., 2020, *Raffles Bulletin of Zoology*, 68, 562–573). We know from the case of the Indo-Pacific humpback dolphin *Sousa chinensis* in the Pearl River Delta affected by the Hong Kong–Macau–Zhuhai bridge (Karczmariski et al., 2016, *Advances in Marine Biology*, 73, 27–64) that the cumulative effects of existing threats and extensive construction in the species’ habitat will have irreversible impacts on its long-term survival.

The Iloilo–Guimaras Straits subpopulation of *O. brevirostris* already faces grave threats from bycatch, collision with boats, illegal fishing, and habitat degradation. During the construction phase of these bridges we would expect an increase in noise pollution from pile driving and the ferrying of materials, and consequent negative effects on the bio-acoustic behaviour of the dolphins and an increased risk of collisions with boats. We expect long-term effects, such as sediment bed changes and scouring, changes in water movement and current, and changes in prey dynamics, to affect the local environment even after the bridges are built. In time, such effects will be felt by local residents who rely on these straits for their livelihood.

Yet, there is still hope. On 6 August 2020, government officials announced the shelving of the Guimaras–Negros segment of this large-scale infrastructure project, citing the presence of mangroves and dolphins. This announcement followed a public outcry that questioned the validity of the preliminary assessment as it had ignored the presence of Irrawaddy dolphins within the proposed construction sites. However, this change offers only temporary relief to this subpopulation, considering the extensive threats to its long-term survival. We must, collectively, continue to give

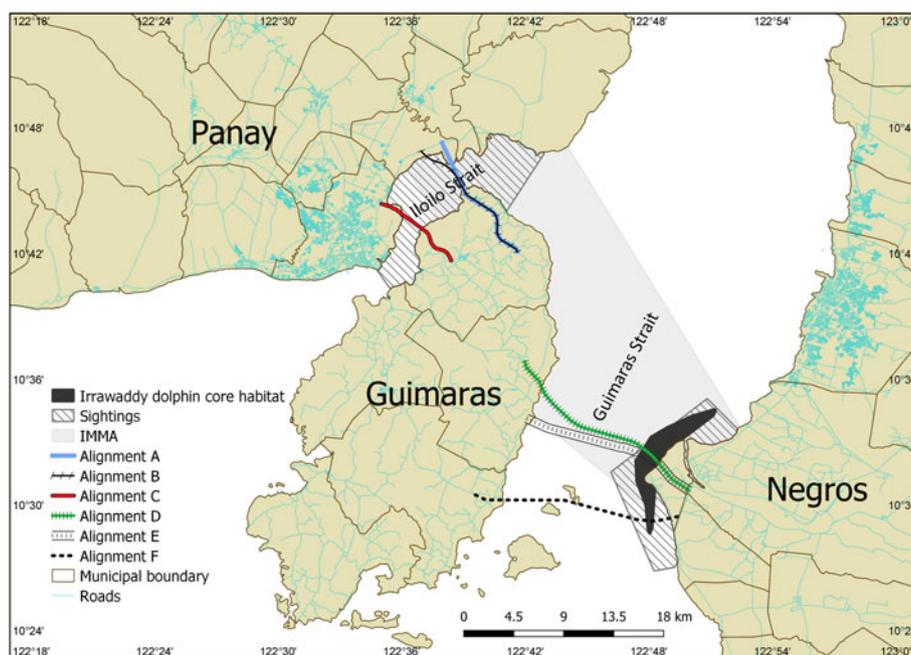


FIG. 1 The known range of the Iloilo-Guimaras Straits subpopulation of the Irrawaddy dolphin *Orcaella brevirostris* in the central Philippines includes parts of the Iloilo and Guimaras Straits. An ambitious project to construct bridges connecting the islands of Panay, Guimaras and Negros would bisect a recognized Important Marine Mammal Area (IMMA) and the core habitat of this Critically Endangered subpopulation of *O. brevirostris*. This map summarizes all known spatial data on the subpopulation. The alignments indicate the different bridge positions being considered. Important Marine Mammal Area boundaries are from Marine Mammal Protected Area Task Force (2020, [marinemammalhabitat.org](https://www.marinemammalhabitat.org)).

due attention to the precarious status of this subpopulation to ensure it remains extant.

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First steps towards conservation of the Endangered blonde capuchin monkey *Sapajus flavius* in the Caatinga dry forest, Brazil

The blonde capuchin monkey *Sapajus flavius* is categorized as Endangered on the IUCN Red List (Valença-Montenegro et al., 2020, [dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T136253A70612866.en](https://doi.org/10.2305/IUCN.UK.2020-2.RLTS.T136253A70612866.en)). The species was previously considered endemic to a narrow strip of the Atlantic Forest in north-eastern Brazil but has been reported in dry forest and has been observed in the Caatinga biome (Ferreira et al., 2009, *Primates*, 50, 357–362; Martins et al., 2016, 26th International Primate Society Congress, Abstract, 206–207). The Atlantic Forest and Caatinga biomes differ markedly in temperature, rainfall, humidity, availability of water bodies and vegetation structure. The Caatinga has a hot and dry climate with a dry season of more than 8 months, and its vegetation comprises low and small trees, with many shrubs and xerophytic species.

As the ecology and behaviour of the blonde capuchin monkey has only been studied in the Atlantic Forest, we are conducting the first study of the species in the Caatinga biome. We are exploring the demography, ecology and behaviour of a population of the blonde capuchin monkey in a dry forest fragment in the state of Rio Grande do Norte, north-east Brazil.

The first phase of the survey was conducted in July–December 2019 when a group was monitored for 7 days per month. Although other species of capuchin monkeys are known to use tools (e.g. *Sapajus libidinosus*; Fragaszy et al., 2004, *American Journal of Primatology*, 64, 359–366), this behaviour has not been reported previously for the blonde capuchin monkey in the Atlantic Forest. In the Caatinga, we observed sites with evidence of the



PLATE 1 Blonde capuchin monkeys *Sapajus flavius* moving on the ground in the Caatinga biome of north-east Brazil (a), along with evidence of their use of hammer and anvil stone tools for opening *Manihot epruinosa* seeds (b), in the site denominated as ‘tool use sites’ (c). Photos: Aluizio dos Santos (a) and Francini Garcia (b, c).

use of stones for cracking nuts of *Manihot epruinosa* (Euphorbiaceae). Small stones were used as a hammer on larger anvil stones, and we found evidence of food items processed by this method (Plate 1). We also observed the species feeding on *Pilosocereus pachycladus* (Cactaceae) fruits, and commonly observed terrestrial behaviour, something that occurs only rarely in the Atlantic Forest.

Our study will continue for the next 3 years, collecting data to evaluate how the blonde capuchin monkey is adapted to this dry forest. We will also examine any potential threats to the species in the Caatinga and develop strategies and actions for the conservation of this primate and its habitat.

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