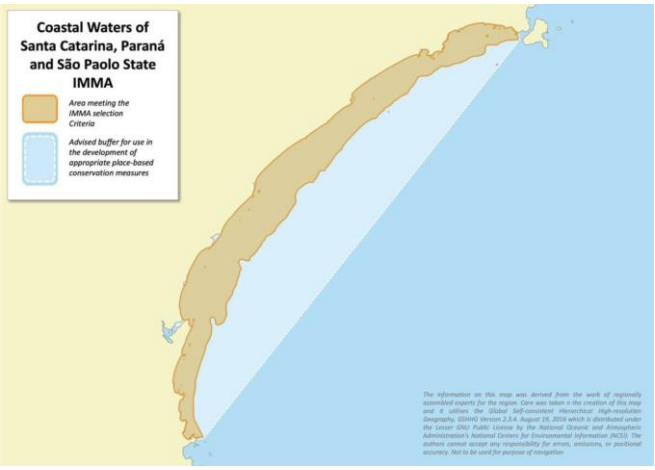

Area Size

14,408 km²

Qualifying Species and Criteria

Franciscana dolphin – *Pontoporia blainvillei*
Criterion A; C (1, 2)

Lahille's bottlenose dolphin – *Tursiops truncatus gephyreus*
Criterion A

Southern right whale – *Eubalaena australis*
Criterion A; C (1)

Criterion D (2) - Marine Mammal Diversity
Balaenoptera edeni, Eubalaena australis, Orcinus orca, Pontoporia blainvillei, Sotalia guianensis, Steno bredanensis, Tursiops truncatus gephyreus, Tursiops truncatus truncatus

Summary

This IMMA encompasses an area of the southeast Brazilian coastline between the latitudes of 23°51' and 27°35', from the shore out to the 30 m isobath. The coastline of this region is characterized by sandy beaches and large estuaries, and represents one of the most industrialized and populated regions in the western South Atlantic Ocean. This IMMA

Coastal Waters of Santa Catarina, Paraná and São Paolo State IMMA

Summary, continued.

encompasses the range of a genetically differentiated population of the threatened franciscana (*Pontoporia blainvillei*) as well as a known area of sympatry for two subspecies of bottlenose dolphins (*Tursiops truncatus*), the threatened Lahille's dolphin (*T. t. gephyreus*) and the common bottlenose dolphin (*T. t. truncatus*). In addition, southern right whales (*Eubalaena australis*) mother and calf pairs have been observed with increasing frequency in southeast Brazilian waters, demonstrating the potential importance of this IMMA in the continued recovery of the southwest Atlantic southern right whale population. Four additional cetacean species, Guiana dolphins (*Sotalia guianensis*), rough-toothed dolphins (*Steno bredanensis*), killer whales (*Orcinus orca*) *and* Bryde's whales (*Balaenoptera edeni*) are also regularly documented in the area.

Description:

This IMMA encompasses the coastline of the southeastern coast of Brazil, between 23°51' S and 27°35' S, including the states of São Paulo, Paraná and Santa Catarina. The boundary extends from the coastline up to the 30 m isobath. The coastline of this region is characterized by sandy beaches and some large estuaries, most notably the Cananeia-Paranaguá estuarine complex where river runoff contributes to local productivity. Oceanographic conditions vary throughout the year with higher productivity in the spring and summer months when the predominant northeast winds promote the upwelling of the sub-tropical water from the bottom

of the continental shelf to the surface (de Castro et al., 2006), and increasing biological productivity in the region. Continental waters (from river runoff) and oceanic waters mix closer to shore (de Castro et al., 2006).

Criterion A: Species or Population Vulnerability

The IMMA provides important habitat for franciscanas (*Pontoporia blainvillei*), which are endemic to coastal waters from Brazil to Argentina. This species is currently listed as "Vulnerable" in the IUCN Red List of Threatened Species (Zerbini et al., 2017) and as "Critically Endangered" nationally in Brazil (MMA/ICMBio 2022).

While this IMMA does not encompass the main range of the Lahille's bottlenose dolphin (*Tursiops truncatus gephyreus*), this subspecies is regularly observed in the area. This subspecies is listed as "Vulnerable" in the IUCN Red List (Vermeulen et al., 2019) and "Endangered" nationally in Brazil (MMA/ICMBio 2022).

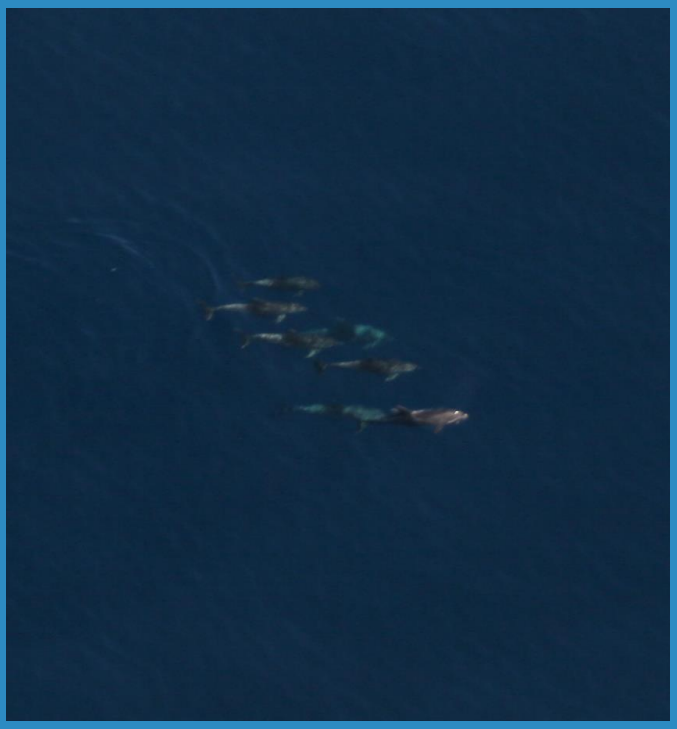

Figure 1: Bottlenose dolphins (*Tursiops truncatus*) sighted in this IMMA. Photo credit: Federico Sucunza - GEMARS/IA

Figure 2: Franciscanas (*Pontoporia blainvillei*) sighted in this IMMA. Photo credit: Federico Sucunza - GEMARS/IA

Even though southern right whales (*Eubalaena australis*) are globally classified as "Least Concern" (Cooke & Zerbini, 2018), the western south Atlantic population of southern right whales is recognized by the International Whaling Commission as threatened and in need of a regional Conservation Management Plan (e.g. IWC, 2018). Although the population showed significant increases following the cessation of commercial hunting, new threats, such as high rates of calf mortality, are hindering the population's recovery. The species is listed nationally as "Endangered" in Brazil (MMA/ICMBio, 2022).

Figure 3: Southern right whale (*Eubalaena australis*). Photo credit: Federico Sucunza - GEMARS/IA

Criterion C: Key Life Cycle Activities
Sub-criterion C1: Reproductive Areas

Because of their small range and year-round residency, the entire reproductive cycle of the franciscana population in this region occurs within the IMMA. Births start early in the austral spring (e.g., October) and decrease gradually until the end of austral summer (e.g., March) (Danilewicz et al., 2022).

The IMMA also seems to be hosting an increasing number of mother-calf pairs of southern right whales, which comprised 55% of all sightings recorded between 1936 and 1999 and 78% between 2000 and 2015 (Santos et al., 2001; Figueiredo et al., 2017). Considering the observed population increase of the western south Atlantic right whales of 4.8%/year (Renault-Braga et al., 2021), the increase in mother-calf sightings in the IMMA is likely to continue along with other reproductive-related behaviours like mating, calving and nursing (e.g. Groch et al., 2005; Seyboth et al., 2015; Figueiredo et al., 2017; Renault-Braga et al., 2018).

Sub-criterion C2: Feeding Areas

Franciscanas are considered to be generalists, varying their diet according to the presence and abundance of preferred prey items. Based on the analysis of stomach contents of stranded and by-caught individuals, franciscanas occurring in this IMMA prey mainly on warm-water species, including demersal fish (e.g. *Cynoscion jamaicensis*) and coastal cephalopods (e.g. *Doryteuthis plei*) (Botta et al., 2022).

Criterion D: Special Attributes
Sub-criterion D2: Diversity

Eight cetacean species have been recorded regularly in this IMMA, which was designed to encompass the most important habitat of the most commonly occurring cetacean off the southeastern Brazilian coast (e.g. Flores & Ximenez, 1997; Figueiredo et al., 2017; Simões-Lopes et al., 2019; Azevedo, 2020; Sucunza et al., 2020; Petrobras, 2021). Franciscanas occurring in this IMMA comprise a genetically distinct population (Cunha et al., 2020). It is noteworthy that

the southern portion of this candidate IMMA is an area of sympatry for two recognized subspecies of *Tursiops truncatus,* the Lahille's dolphin, *T. t. gephyreus*, and the common bottlenose dolphin, *T. t. truncatus* (Simões-Lopes et al., 2019; Pereira et al., 2020). Guiana dolphins are commonly observed in this IMMA, with concentrations of observations in estuaries, bays and coastal sheltered areas up to 25 m of depth (Figueiredo et al., 2020; Domit et al., 2021). In addition, this IMMA is regularly used by rough-toothed dolphins (*Steno bredanensis*), killer whales (*Orcinus orca*) and Bryde's whales (*Balaenoptera edeni*), with evidence of local movements (Santos et al., 2019) and feeding behavior for all these species (Siciliano et al., 2004; Santos et al., 2005; Santos et al., 2019). Southern right whales have been recolonisnig historical habitats, with an increasing use of the southeastern Brazilian coast during the species' breeding season (Santos et al., 2001; Figueiredo et al., 2017).

Figure 4: Guiana dolphins (*Sotalia guianensis*). Photo credit: Federico Sucunza - GEMARS/IA

Figure 5: Rough-toothed dolphins (*Steno bredanensis*). Photo credit: Federico Sucunza - GEMARS/IA

Figure 6: Killer whales (*Orcinus orca*). Photo credit: Rodrigo C Genovês – ECOMEGA/FURG

Supporting Information

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