

Guanabara–Sepetiba Coastal Embayment Complex IMMA

Description:

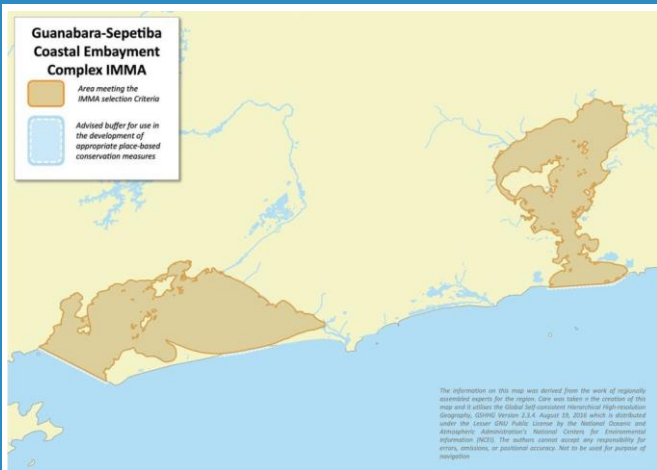
The Guanabara–Sepetiba Coastal Embayment Complex IMMA includes two coastal bays (Guanabara and Sepetiba bays) that are not connected but that share similar estuarine characteristics.

Guanabara Bay

Guanabara Bay (22°50'S – 43°10') is located in Rio de Janeiro State, southeastern Brazil. The bay has a total area of 372 km². The mean depth is 5.7 m, and along the main channel depths reach an average of 20 m. This is an estuarine ecosystem, where the freshwater contribution is derived from 35 rivers that flow into the bay (Kjerfve, 1997; Amador, 2013). The bay has only one conservation unit (*Área de Proteção Ambiental de Guapimirim*) in its Northern portion which covers both marine and mangrove environments.

Sepetiba Bay

Sepetiba Bay is located on the southwestern coast of Rio de Janeiro State (43°30'W/44°10'W – 22°50'/23°05'S) and is surrounded by Rio de Janeiro, Itaguaí and Mangaratiba municipalities. With a total surface area of around 520 km², this bay includes a number of different ecosystems such as sandy beaches, rocky shores, estuaries, and intertidal swamps (SEMADS, 2001). It is also strongly influenced by its surrounding hydrographic basin and resulting freshwater inputs (Signorini, 1980). Mangroves are a feeding and reproduction ground for many species, and also act as a nursery area for different fish species. The bay also includes 49 islands and water



Area Size

980 km²

Qualifying Species and Criteria

Guiana dolphin – *Sotalia guianensis*

Criterion A; B (1,2); C (1,2)

Rough-toothed dolphin – *Steno bredanensis*

Criterion C (2)

Summary

The Guanabara–Sepetiba Coastal Embayment Complex IMMA includes two coastal bays with estuarine characteristics and rich ecosystem environments including sand beaches, rocky shores, mangroves, islands, and rivers. These areas share similar characteristics that are suitable for the residency and survival of the nationally “Vulnerable” and globally “Near Threatened” Guiana dolphins (*Sotalia guianensis*). Rough-toothed dolphins (*Steno bredanensis*) and bottlenose dolphins (*Tursiops truncatus*) are non-resident species but regularly observed feeding in Guanabara Bay. Harbour activities, heavy boat traffic, chemical and noise pollution, overfishing and bycatch are the main threats in this IMMA. The bays comprise two marine conservation units. Although Sepetiba and Guanabara Bay are not geographically connected, movement of Guiana dolphin individuals between both environments was reported through photo-identification efforts.

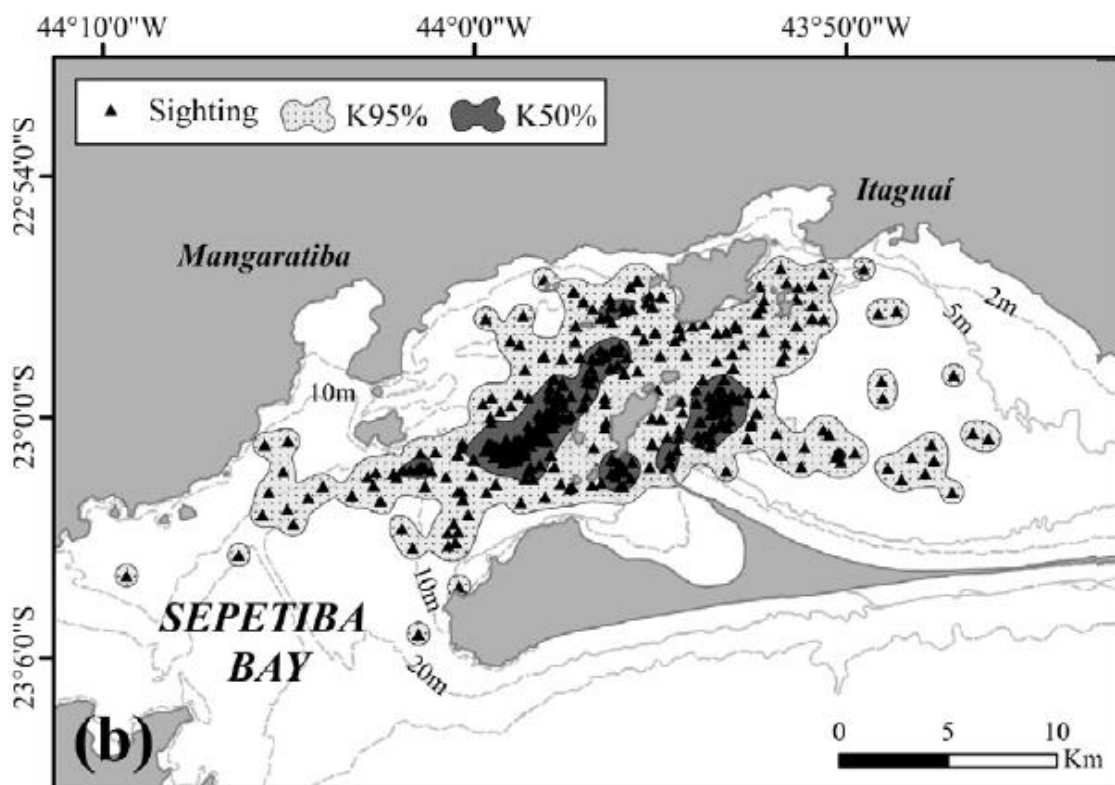
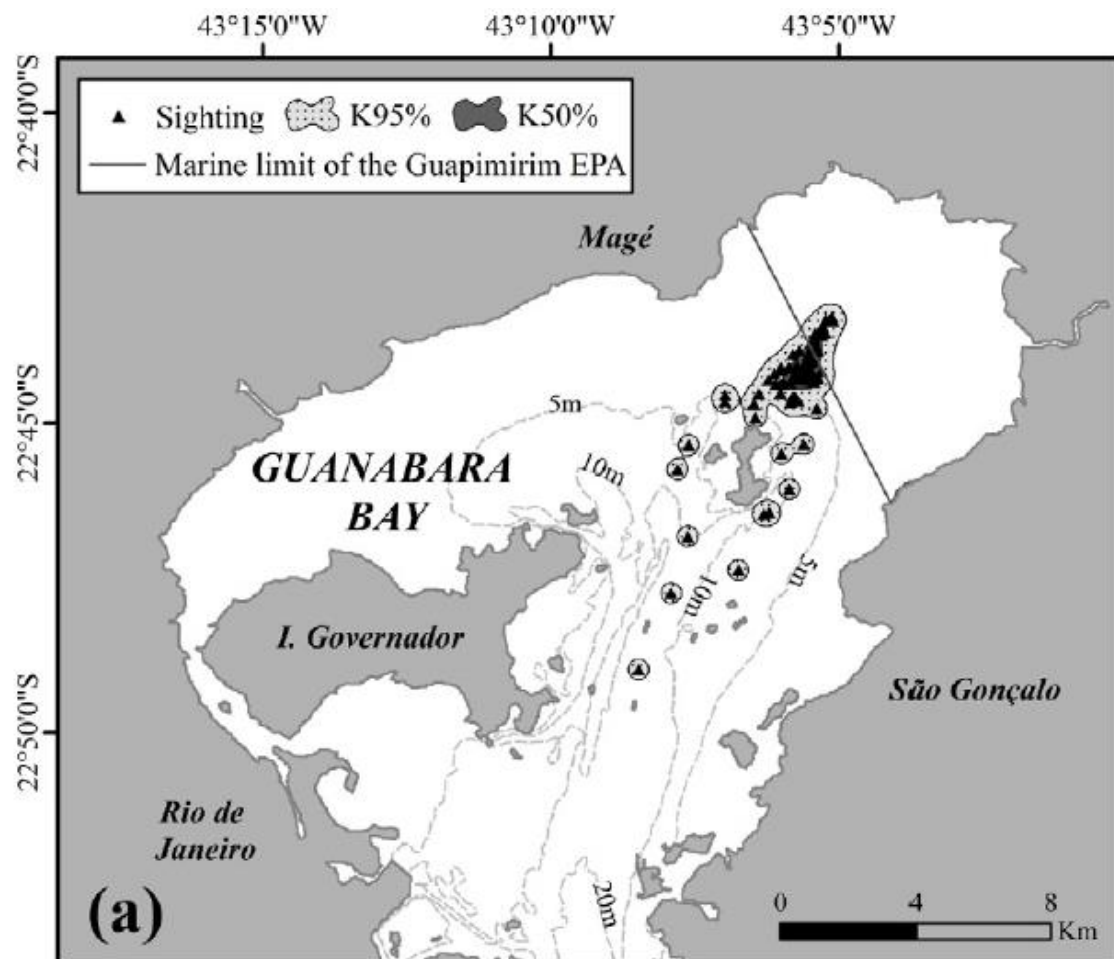


Figure 1: Distribution of Guiana dolphins (*Sotalia guianensis*) in Guanabara Bay (a) and Sepetiba Bay (b), between 2017 and 2019, estimated by the fixed Kernel Density method. Excerpt from Ribeiro-Campos et al. (2021)



Figure 2: Guiana dolphin (*Sotalia guianensis*) in Sepetiba Bay. Photo credit: MAQUA/UERJ

depths that range from 2 to 12 m, reaching 30 m in the main channel (Copeland et al., 2003). Water circulation is influenced by tidal and wind driven currents, specially southwest winds. This area includes some conservation units on its surrounding lands, but the *Área de Proteção Ambiental do boto-cinza* is an important conservation unit that has a total area of 247,6 km² comprising 45% of Sepetiba Bay water surface area.

Criterion A: Species or Population Vulnerability

Guiana dolphin (*Sotalia guianensis*) is classified "Near Threatened" by IUCN (Secchi et al., 2018) and "Vulnerable" on the Brazilian Endangered Species National List (MMA/ICMBio, 2022).

Criterion B: Distribution and Abundance **Sub-criterion B1: Small and Resident Populations**

Through a long-term mark-recapture effort using photo-identification in Guanabara Bay, Azevedo et al. (2017) reported on the first decline of a delphinid population in Brazilian waters. The Guiana dolphin population in Guanabara Bay declined from 62 (95%CI 59 – 65) to 39 (37 – 40) representing a 63% decline in the resident population in an interval of 15 years. In Guanabara Bay, Guiana dolphins are resident and socializing and births are registered year-round (Azevedo et al., 2005; Azevedo et al., 2017). Guiana dolphins are reported to feed between 60-80% of the time in Guanabara Bay (Azevedo et al., 2007; Ribeiro-Campos et al., 2021).



Figure 3: Guiana dolphin (*Sotalia guianensis*) leaping out of the water in Guanabara Bay. Photo credit: MAQUA/UERJ

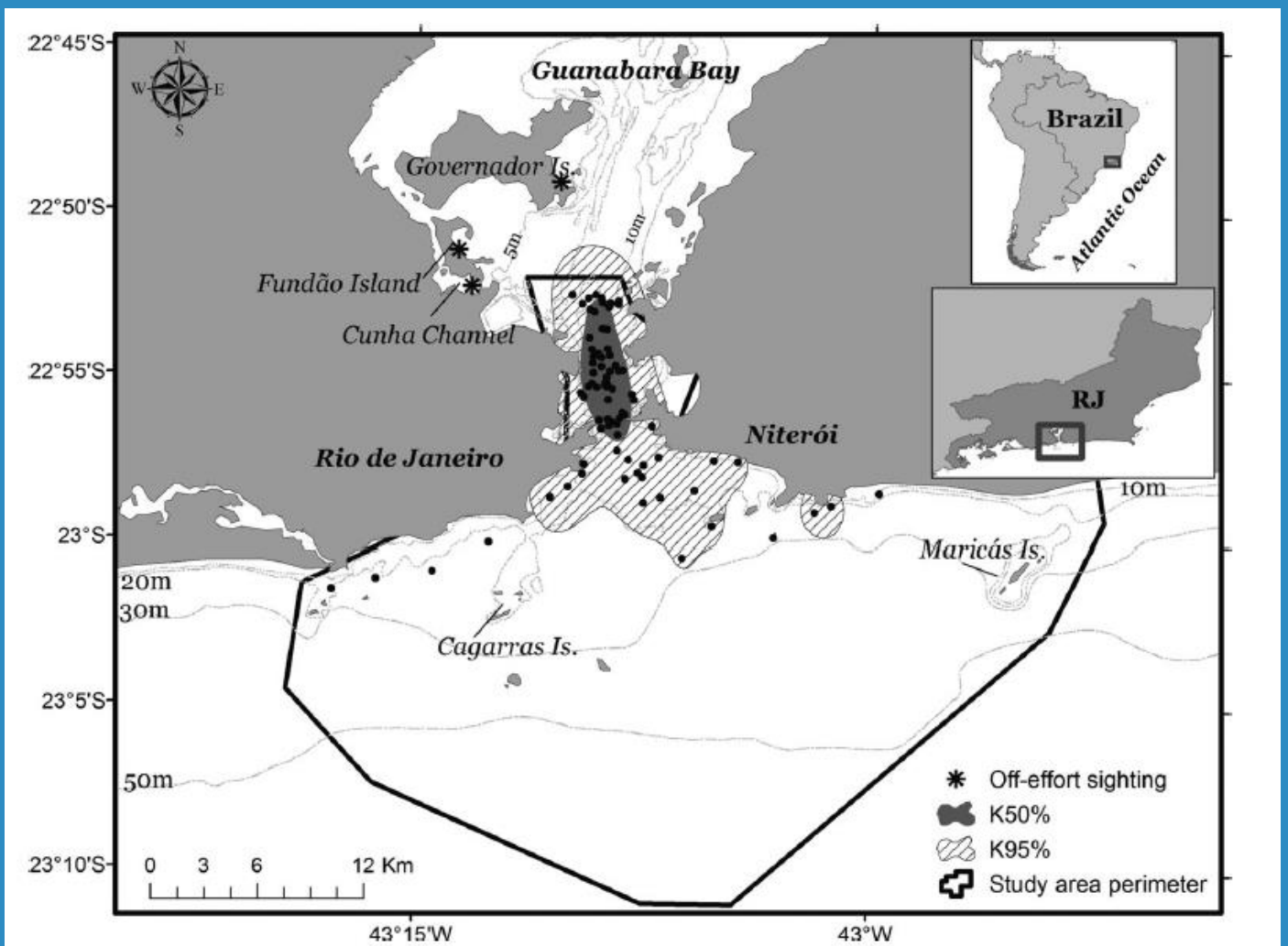


Figure 4: Distribution of *S. bredanensis* between 2009 and 2017 in Guanabara Bay. Excerpt from: Carvallho et al. (2020)



Figure 5: Guiana dolphins (*Sotalia guianensis*) mother and calf pair in Guanabara Bay. Photo credit: MAQUA/UERJ

Sub-criterion B2: Aggregations

The Guiana dolphin population in Sepetiba Bay is reported as resident and aggregations of up to 200 individuals are commonly reported in that area (Flach et al., 2008; Ribeiro-Campos et al., 2021). The most recent estimate for the Guiana dolphin population in Sepetiba Bay was conducted using data from mark-recapture photo-identification efforts from 2017 to 2020 where 1,620 individuals (CI 95% 1,555 – 1,697) were estimated (Quintana, 2020).

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

In Sepetiba Bay births of the Guiana dolphin are observed year-round and neonates and calves are frequently reported (Flach et al., 2008; Ribeiro-Campos et al., 2021).

Sub-Criterion C2: Feeding Areas

In Sepetiba bay, groups of Guiana dolphins can be seen feeding, socializing, traveling, and resting on a daily basis (Ribeiro-Campos et al., 2021; Beirão-Campos et al., 2019).

Carvalho et al. (2020) reported that feeding was the most common behavior observed for *Steno bredanensis* in Guanabara Bay. Main preys in this area are largehead hairtail fish (*Trichiurus lepturus*), mullets (*Mugil curema* and *Mugil liza*) and cephalopods such as *Loligo plei* and *Loligo sanpaulensis* (Melo et al., 2010; Lodi & Maricato, 2020). Stable isotopic analyses showed that *S. bredanensis* typically an inner continental shelf predator, was in this area sharing prey species in the same ecological group as the strictly coastal resident *Sotalia guianensis* (Bisi et al., 2013).



Figure 6: Rough-toothed dolphins (*Steno bredanensis*) feeding on *Trichiurus lepturus* in Guanabara Bay. Photo credits: MAQUA/UERJ



Figure 7: Rough-toothed dolphins (*Steno bredanensis*) leaping in Guanabara Bay. Photo credits: MAQUA/UERJ

The occurrence of *Tursiops truncatus* is seasonal, possibly associated to upwelling events in the summer (Lodi, 2016). Stomach content analyses showed that Atlantic midshipman fish (*Porichthys porosissimus*) and the squid (*Loligo sanpaulensis*) were the main preys of teleosts and cephalopods, respectively, in this area (Melo et al., 2010).

Supporting Information

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