

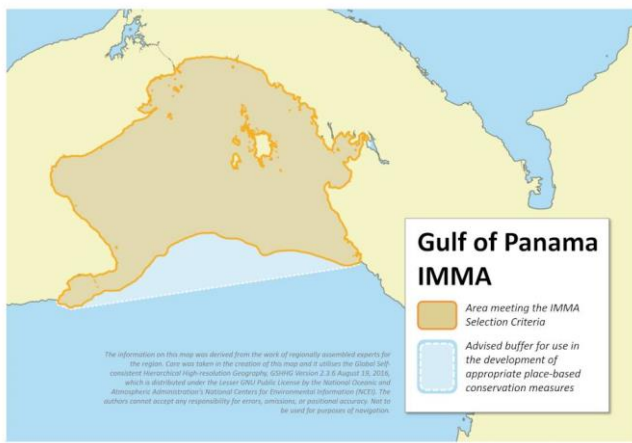
# Gulf of Panama IMMA

## Summary, continued.

Commission (IWC). Coastal common bottlenose dolphins (*Tursiops truncatus*) and pantropical spotted dolphin (*Stenella attenuata*) can be observed year-round in the Gulf of Panama. Pantropical spotted dolphin is considered one of the most common species distributed in the area. The presence of commercial shipping at the entrance of the Panama Canal, and the associated noise, are considered significant threats to cetacean species in the area.

## Description:

The Gulf of Panama is characterized by upwelling events during the dry season, supporting large fish populations and pelagic fisheries that attract many species of seabirds, tuna and dolphins to the area (D'Croz & O'Dea, 2007). The gulf contains several protected areas like Las Perlas Archipelago Special Marine Management Zone, Boná Wildlife Refuge, Iguana Island Wildlife Refuge, and Punta Patiño Private Natural Reserve. The area is characterized by a high density of shipping traffic entering and exiting the Panama Canal, creating the threat of ship-strikes for whales in the Gulf (Guzman et al., 2012), as well as noise pollution (Campbell, 2014). The IMMA also hosts a high density of whale watching activities (Fig. 1) that can place additional pressures on cetaceans in the area (Amrein et al., 2020). Between 2009 and 2021, 113 stranding reports were attended in the Gulf of Panama of which 87% were in the Azuero Peninsula (Trejos-Lasso, 2015; Trejos-Lasso, unpublished).



## Area Size

28 371 km<sup>2</sup>

## Qualifying Species and Criteria

Humpback whale – *Megaptera novaeangliae*

Criterion C (1)

Pantropical spotted dolphin – *Stenella attenuata*

Criterion C (2)

Common bottlenose dolphin –

*Tursiops truncatus*

Criterion C (2)

## Marine Mammal Diversity

*Pseudorca crassidens*, *Balaenoptera edeni*

## Summary

The Gulf of Panama IMMA is located off the Pacific coast of Panama, and encompasses an area 250 km wide with a maximum depth of 220m. The Gulf contains some protected areas such as Las Perlas Archipelago Special Marine Management Zone, Boná Wildlife Refuge, Iguana Island Wildlife Refuge, and the Punta Patiño Private Natural Reserve, each of which host populations of marine mammals. The Gulf is one of the core breeding areas for the Southern Hemisphere humpback whale (*Megaptera novaeangliae australis*) population designated as Breeding Stock G by the International Whaling



Figure 1: Whale-watching activities in Las Perlas Archipelago Marine Management Zone in the Gulf of Panama. Photo credit: Betzi Pérez.

## Criterion C: Key Life Cycle Activities

### Sub-criterion C1: Reproductive Areas

Las Perlas Archipelago is considered the main habitat within the IMMA for Southern Hemisphere humpback whale (*Megaptera novaeangliae australis*) nursing, calving, and mating, with 20% of 295 individuals observed between 2003-2009 identified as calves (Guzman et al., 2014). Between 2003-2009, the population size of Southern Hemisphere humpback whales in Las Perlas Archipelago was estimated at over 200 whales per season and over 900 whales between all seasons (Guzman et al., 2014). Iguana island is also considered an important habitat for mothers and calves, which comprised 52% of all observed groups in the area (n=48; Ng, 2022). The northwest of the island contains the highest

population density of humpback whales, with most documented sightings in waters less than 100 m deep (Ng, 2022). Humpback whale song, which is considered an important behaviour within the mating system of the species (Herman, 2017) was reported during the breeding season in both Las Perlas and Iguana Island (Oviedo et al., 2008; Ponce, 2015). Satellite tracking also shows that humpback whales move inside the entire Gulf but with Las Perlas Archipelago as a core area (Guzman et al., 2013, 2014). Northern Hemisphere humpback whales have been reported to use the Gulf of Chiriquí (Curtis et al., 2022), and in the coast of Colombia (Avila et al., 2020). Although the Gulf of Panama is in the middle of these two sites, there is little evidence that this IMMA is significant for the Central America distinct population segment (DPS). An opportunistic sighting (supported

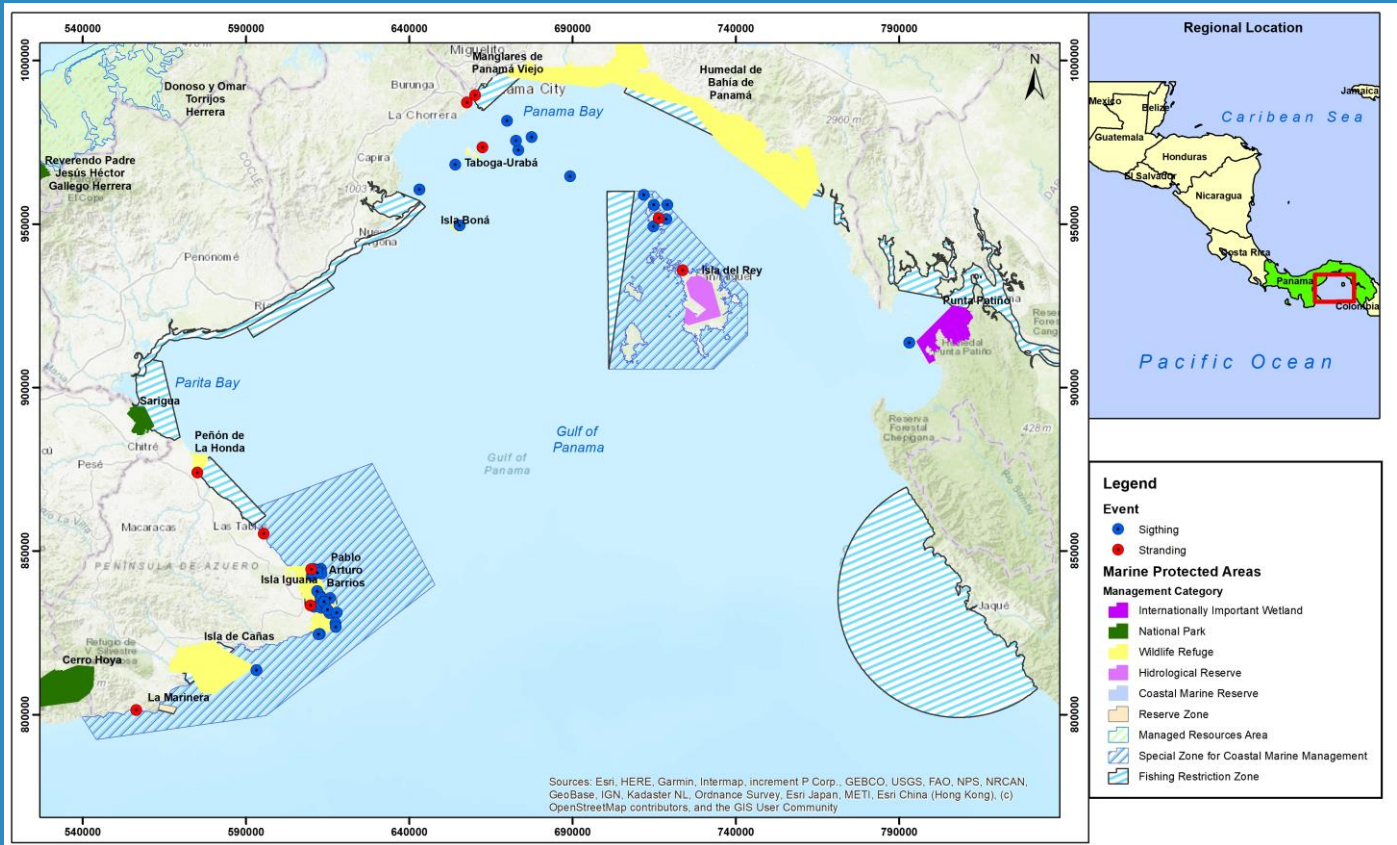


Figure 2: Marine Protected Areas within the Gulf of Panama. Cetaceans sightings are represented by the blue dots and stranding events by the red dots in survey between 2019 and 2023 (data base: Miambiente and Panacetacea), prepared by the DIAM/DICOMAR-MiAmbiente 2023.

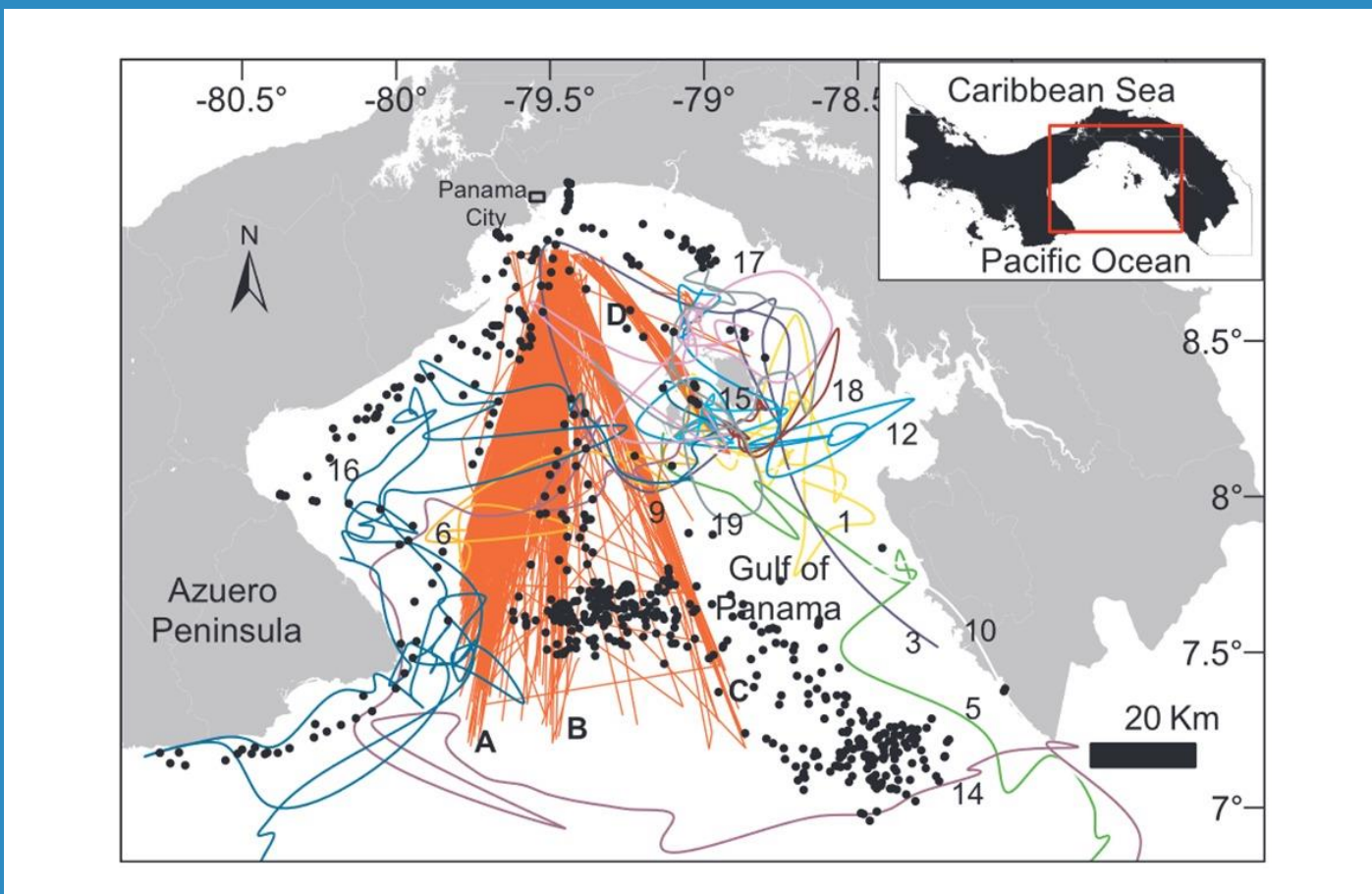


Figure 3: Potential interaction between maritime traffic and humpback whales at the entrance of the Panama Canal Pacific during five days of satellite survey in August 2009. Black dots represents local fishing vessels, orange lines represent the Panama Canal ship traffic, and 12 tracks of whales. Reproduced from Guzman et al. (2013).



# WHALE AVOIDANCE STRATEGY ESTRATEGIA PARA EVITAR A LAS BALLENAS



Figure 4: Traffic Separation Scheme, approved by the Republic of Panama and adopted by the International Maritime Organization, used by Panama Canal Authority, the Panamanian shipping lanes were implemented since December 2014. Reproduced from Smithsonian, Science & Conservation (2016).

by a photograph) of humpback whales in the month of March 2020 in Las Perlas Archipelago, suggest that some individual humpback whales from the Northern Hemisphere may also use the archipelago as a breeding ground. However, further investigation will be necessary to confirm the use of the Gulf of Panama as a breeding ground for the Central America humpback whales.

## Sub-criterion C2: Feeding Areas

The Gulf of Panama is the most productive area of the entire Pacific coast of Panama due to upwelling events, that create conditions to support large

populations of fish (D'Croz & O'Dea, 2007). Modelling data suggests that prey is an important factor influencing the distribution of bottlenose dolphins in the areas close to the Panama Canal entrance (Campbell et al., 2014). Iguana Island is also considered an important feeding area for bottlenose dolphins, for which 25% of documented encounters (n=32) involved feeding activities. Pantropical spotted dolphins also feed in the area with 15% of documented sightings (n=60) involving feeding activities (Urriola, 2017; Garcia, 2018; Casas & Trejos-Lasso, unpublished).

## Supporting Information

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## Acknowledgements

We would like to thank the participants of the 2022 hybrid IMMA Regional Expert Workshop for the identification of IMMAs in the South East Tropical and Temperate Pacific Ocean. Funding for the identification of this IMMA was provided by the Global Ocean Biodiversity Initiative funded by the German government's International Climate Initiative (IKI). Support was also provided by Whale and Dolphin Conservation, the Promar Foundation, and the Tethys Research Institute.

Special Thanks to the Directorate of Environmental Information DIAM & Directorate of Coast and Seas DICOMAR of the Environmental Ministry 2023.

