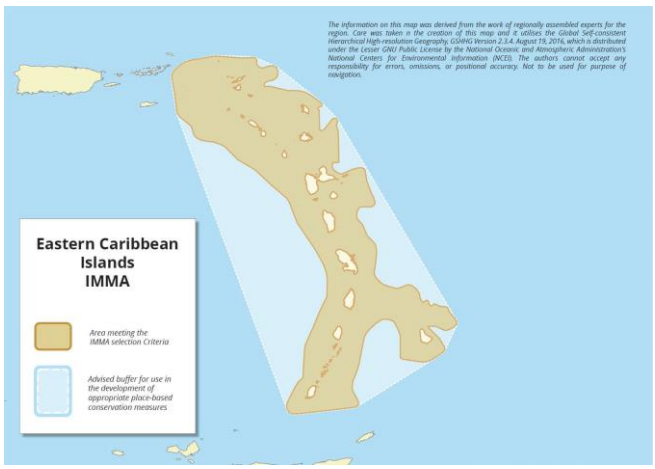
Eastern Caribbean Islands IMMA



Area Size

133,300 km²

Qualifying Species and Criteria

Sperm Whale – *Physeter macrocephalus*

Criterion A; B (1)

Short-finned Pilot Whale – *Globicephala macrorhynchus*

Criterion B (2)

Fraser's dolphin – *Lagenodelphis hosei*

Criterion B (2)

Melon-headed Whale – *Peponocephala electra*

Criterion B (2)

Pantropical spotted dolphin – *Stenella attenuata*

Criterion B (1)

Spinner dolphin – *Stenella longirostris*

Criterion B (2)

Criterion D (2) – Marine Mammal Diversity

Balaenoptera edeni brydei, Feresa attenuata, Globicephala macrorhynchus, Grampus griseus, Kogia breviceps, Kogia sima, Lagenodelphis hosei, Megaptera novaeangliae, Mesoplodon densirostris, Mesoplodon europaeus, Orcinus orca, Peponocephala electra, Physeter macrocephalus, Pseudorca crassidens, Stenella attenuata, Stenella clymene, Stenella coeruleoalba, Stenella frontalis, Stenella longirostris, Steno bredanensis, Tursiops truncatus, Ziphius cavirostris

Other Marine Mammal Species Documented

Balaenoptera borealis

Summary

The Eastern Caribbean Islands IMMA encompasses the Lesser Antillean arch from Anguilla in the north to Grenada in the south, including Barbados. It extends from the island coasts to the 2,000 m contour, encompassing a large portion of the Grenada Basin. The area includes a variety of important habitats: continental shelf, shallow banks, shelf break, canyons, inter-island channels, deep waters and seamounts. Within this area there are three distinct cultural clans of Vulnerable sperm whales (*Physeter macrocephalus*); small and resident populations of pantropical spotted dolphins (*Stenella attenuata*); aggregations of several delphinid species; as well as feeding areas for multiple delphinid species. The area sustains a high diversity of 22 commonly observed marine mammal species. The IMMA includes portions of the French Agoa and Dutch Yarari Sanctuaries, and fully encompasses the Dominica National Sperm Whale Reserve and many smaller national marine protected areas along the chain. It is also almost entirely contained within the boundaries of the Eastern Caribbean EBSA.

Description:

The Eastern Caribbean IMMA encompasses the Lesser Antillean arch from Anguilla in the north to Grenada in the south including Barbados. It extends to the 2,000 m contour from the island coasts, encompassing a large portion of the Grenada Basin. The area includes a variety of important habitats for the qualifying species: continental shelf, shallow

Figure 1: A group of Fraser's dolphins (*Lagenodelphis hosei*) in Martinique. Photo credit: Caribbean Cetacean Society.

banks, shelf break, canyons, channels, deep waters and seamounts. The shelf is more pronounced amongst the northern islands and becomes progressively narrower southward along the island chain. Channels between islands promote eddies on the leeward sides of islands. In addition to many seamounts within the IMMA, seasonal variation in precipitation creates river runoff affecting salinity, particularly coastally; powerful seasonal storms; as well as the prevalence of sargassum. Taken together, these features create a variety of submesoscale habitats seasonally.

The IMMA includes portions of the French Agoa and Dutch Yarari Marine Mammal Sanctuaries, as well as wholly containing the Dominica National Sperm Whale Reserve and many smaller national marine protected areas along the chain. It is also almost entirely contained within the boundaries of the Eastern Caribbean EBSA.

Criterion A: Species or Population Vulnerability

The area provides important habitat for a unique community of sperm whales (*Physeter macrocephalus*), that are assessed as Vulnerable on the IUCN Red List of Threatened Species (Taylor et al., 2019). Data indicate a concerning decline in populations over time (Whitehead & Shin, 2022). From an estimated pre-whaling global population of about 1,950,000, the species experienced a significant reduction to about 850,000 in 2022. Concerns persist that some populations of sperm whales continue to decline, including those in the IMMA (Gero & Whitehead, 2016) which are estimated to number fewer than 600 individuals (Vachon et al., 2024). Based on two large aerial surveys (Remmoa) in February 2008 and October 2017, the density of sperm whales in the IMMA was estimated to be 0.10-0.13 ind/100km^2 (Laran et al., 2019).

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

High re-identification rates, small scale movement patterns, and fine-scale habitat use modelling suggest that the community of sperm whales using the IMMA is small and isolated (Gero et al., 2014). There have been no matches between female sperm whales from the Eastern Caribbean to any other site in which research has been conducted nearby (Gulf of Mexico, Bahamas, Sargasso Sea; Gero et al., 2007), except for 2 recent matches of females with Dominican Republic (CCS, 2024).

In addition, Vachon et al (2022a,b) demonstrate fine scale habitat preferences and dramatically smaller movement patterns for this community compared to those studied in the Eastern Tropical Pacific.

Capture-Mark-Recapture models based on photo-identification in Martinique and Guadeloupe identified two clusters of pantropical spotted dolphins (*Stenella attenuata*), qualified as "frequent users" and "occasional visitors". Frequent users are estimated to be 657 (95% CI: 525–821) in Guadeloupe, and 336 (95% CI: 253–446) in Martinique. Individuals qualified as visitors were estimated to be 3,063 (95% CI: 2,133–4,398) and 1,443 (95% CI: 1,024–2,033), respectively (Courtin et al., 2023). The distinction in site fidelity between groups and the very low recapture rate between islands (1 individual between 2014 and 2019) also suggests a community residency by island (Courtin et al., 2023).

Sub-criterion B2: Aggregations

Recent boat surveys conducted in the IMMA during both wet and dry seasons have documented Fraser's dolphin (*Lagenodelphis hosei*), melon-headed whales (*Peponocephala electra*), and short-finned pilot whales (*Globicephala macrorhynchus*) aggregated in groups of 100s to 1000s (Gandilhon, 2012; Bernus et al., 2024; CCS, unpublished data). Such aggregations have also been documented in the past and include mixed species assemblages (Gero et al., 2006; Coché et al., 2021, 2024). The underlying reason(s) for such aggregations are still unclear but the high densities are likely to be linked to the high diversity of habitats found along the Caribbean coast and continental slope; as well as being associated with foraging patches perhaps driven by both the island eddies, upwelling, and sargassum patches.

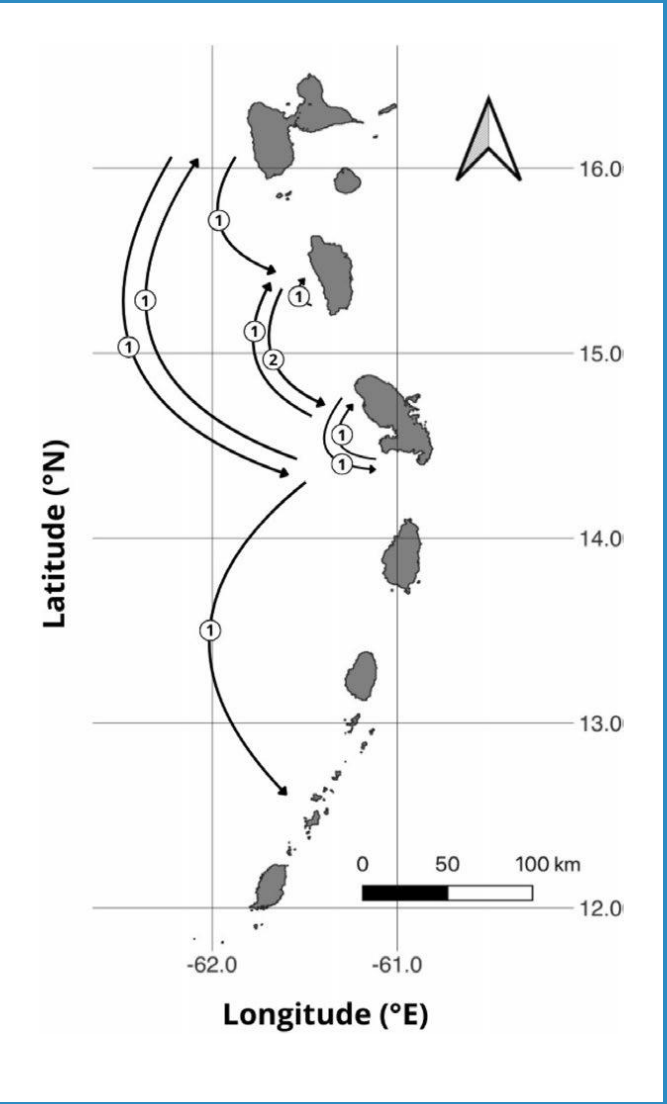


Figure 2: Fraser's dolphin (*Lagenodelphis hosei*) movements between sightings. Black arrows represent movements between sighting and resighting locations. Numbers represent the number of resighted dolphins observed together during both capture and recapture events. Map excerpt from Bernier et al. (2025).

Criterion D: Special Attributes
Sub-criterion D2: Diversity

The area includes a variety of important habitats for cetaceans, including shallow banks, continental shelf, shelf breaks, canyons, channels, deep waters and seamounts; therefore supporting a large diversity of species. In addition to the six species listed above, a further 18 cetacean species have been commonly recorded in the Eastern Caribbean through ongoing research including humpback whales (*Megaptera novaeangliae*), Bryde's whales (*Balaenoptera edeni*), Risso's dolphins (*Grampus griseus*), Clymene dolphins (*Stenella clymene*), striped dolphins (*Stenella coeruleoalba*), false killer whales (*Pseudorca crassidens*), pygmy killer whales (*Feresa attenuata*), Atlantic spotted dolphins (*Stenella frontalis*), common bottlenose dolphins (*Tursiops truncatus*), rough-toothed dolphins (*Steno bredanensis*), killer whales (*Orcinus orca*), pygmy sperm whales (*Kogia breviceps*), dwarf sperm whales (*Kogia sima*), Gervais' beaked whales (*Mesoplodon europaeus*), Blainville's beaked whales (*Mesoplodon densirostris*) and Cuvier's beaked whales (*Ziphius longirostris*) (Gero et al., 2006; Yoshida et al., 2010; Gandilhon, 2012; Coché et al., 2021, 2024; Bernus et al., 2024; CCS, Unpublished data; Gero, unpublished data). Importantly, photo identification has yielded matches between islands across the IMMA for several of these species suggesting inter-island movement and a need for cross-boundary international management (Gero et al., 2007; Vachon et al., 2022a,b, 2024; Bernier et al., 2023; Martin-Marin et al., 2023; Renia et al., 2023; Simon et al., 2023; Bernus et al., 2024; CCS, unpublished data; Gero, unpublished data).

Figure 3: Pantropical spotted dolphin (*Stenella attenuata*) in Lesser Antilles. Photo credit: Caribbean Cetacean Society.

Figure 4: Fraser's dolphins (*Lagenodelphis hosei*) mother and calf in Saint Lucia. Photo credit: Caribbean Cetacean Society.

Figure 5: Atlantic spotted dolphins (*Stenella frontalis*) seen underwater in Curacao Dutch Caribbean. Photo credit: Caribbean Cetacean Society.

Figure 6: Bryde's whale (*Balaenoptera edeni*) in Los Roques. Photo credit: Caribbean Cetacean Society.

Figure 7: Killer whales (*Orcinus orca*) in Saint Vincent. Photo credit: Caribbean Cetacean Society.

Figure 8: Humpback whales (*Megaptera novaeangliae*) obeserved in this IMMA. Photo credit: Caribbean Cetacean Society.

Figure 9: Common bottlenose dolphin (*Tursiops truncatus*) calf leaping in Bonaire Dutch Caribbean. Photo credit: Caribbean Cetacean Society.

Supporting Information

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Acknowledgements

We would like to thank the participants of the 2024 IMMA Regional Expert Workshop for the identification of IMMAs in the North West Atlantic Ocean and wider Caribbean region. Funding for the identification of this IMMA was provided by the Water Revolution Foundation, with additional funding and collaboration from the Sargasso Sea Commission, OceanCare and Animal Welfare Institute. Essential administrative support was given by Tethys Research Institute and Whale and Dolphin Conservation.

Suggested Citation: IUCN-MMPATF (2025) Eastern Caribbean Islands IMMA Factsheet. IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force, 2025.

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