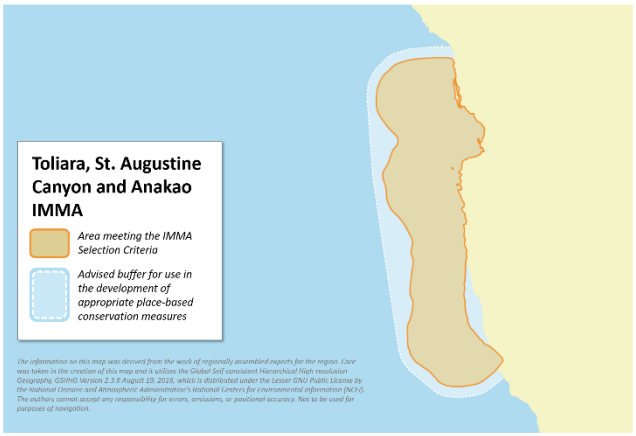

Area Size

6,069 km²

Qualifying Species and Criteria

Humpback whale – *Megaptera novaeangliae*
Criterion C1

Indian Ocean humpback dolphin – *Sousa plumbea*
Criteria A, B1

Spinner dolphin – *Stenella longirostris*
Criterion B2

Risso's dolphin – *Grampus griseus*
Criterion B2

Short-finned pilot whale – *Globicephala macrorhynchus*
Criterion B2

Marine Mammal Diversity (D2)

Balaenoptera bonaerensis, Balaenoptera musculus brevicauda, Balaenoptera musculus intermedia, Balaenoptera physalus, Eubalaena australis, Kogia sima, Lagenodelphis hosei, Peponocephala electra, Physeter macrocephalus, Pseudorca crassidens, Stenella attenuata, Steno bredanensis, Tursiops aduncus, Tursiops truncatus

Toliara, St. Augustine Canyon and Anakao IMMA

Summary

This region in the southwest of Madagascar is dominated by the third largest reef system in the world, the Grand Recif de Toliara, which is made up of barrier and fringing reefs and extensive shallow lagoons. The IMMA also includes coastal mangroves, submarine canyons, a relatively narrow shelf, and a steep continental slope. These diverse habitats support high cetacean biodiversity, with a minimum of 18 documented species, including five baleen whales, two highly coastal dolphin species, and 11 species of oceanic dolphins and toothed whales. The Toliara and Anakao area is a well-documented breeding area for humpback whales (*Megaptera novaeangliae*), and a migratory area for Antarctic and pygmy blue whales (*Balaenoptera musculus intermedia* and *B. m. brevicauda*), fin whales (*Balaenoptera physalus*) and Antarctic minke whales (*Balaenoptera bonaerensis*). The Endangered Indian Ocean humpback dolphins (*Sousa plumbea*) and Near Threatened Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) that are found in the IMMA's inshore waters were the target of active directed hunts and are still at risk of bycatch in small-scale fisheries in the region.

Description

The region in the southwest of Madagascar south of the city of Toliara has several notable features that provide habitat for a diverse assemblage of cetaceans. The Grand Recif de Toliara is the third largest coral reef system in the world, extending from just north of Toliara to the village of St. Augustine. The reef is made up of barrier and fringing reefs and extensive shallow lagoons. There are extensive mangrove systems along the coast inside the main lagoon of the Recife. On the southern edge of the Grand Recife lies the Saint Augustine Submarine Canyon, extending into the narrow continental shelf from the outflow of the Onilahy River at the village of St. Augustine. The presence of the canyon cutting

through the shelf brings deep water habitat very close to the coast, and as such typically deep-water species (e.g., Risso's dolphins, short-finned pilot whales and offshore common bottlenose dolphin) can be found just outside the southern outer edge of the Grand Recife. South of the Canyon, the shelf is relatively narrow with a steep slope past the general area of the village of Anakao, where a large population of the Malagasy Veso ethnic group resides and subsists on ocean resources.

Criterion A: Species or Population Vulnerability

Indian Ocean humpback dolphin (*Sousa plumbea*), IUCN Red List Endangered: A population resides in the near coastal habitat of this region, as documented by several studies (Andrianarivelo, 2001; Razafindrakoto et al., 2004; Van Canneyt et al., 2010; Cerchio et al., 2015). There is a history of extensive artisanal hunting and bycatch in local fisheries that has resulted in a documented decline in group size and encounter rate of groups and individuals (Andrianarivelo, 2001; Razafindrakoto et al, 2004; Cerchio et al., 2009; 2015). Conservation efforts in local villages to develop community-based protection mechanisms, outreach and education, and alternative-livelihoods to replace hunting, has resulted in the apparent cessation of hunting among the three main "communes" (groups of villages) of the Anakao region (Cerchio et al., 2014; Andrianarivelo, pers. comm.). These conservation efforts are currently sustained by the presence of a community-based 'Association for the Protection of Whales and Dolphins' (or in Malagasy, 'Fikambanana Miaro ny Trozona sy Fesotra', FMTF), consisting entirely of traditional Vezo fishers from the three participating communes (Cerchio et al. 2014).

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

The impacted small population of Indian Ocean humpback dolphin, as described above, is likely resident in the area, although the extent of individual

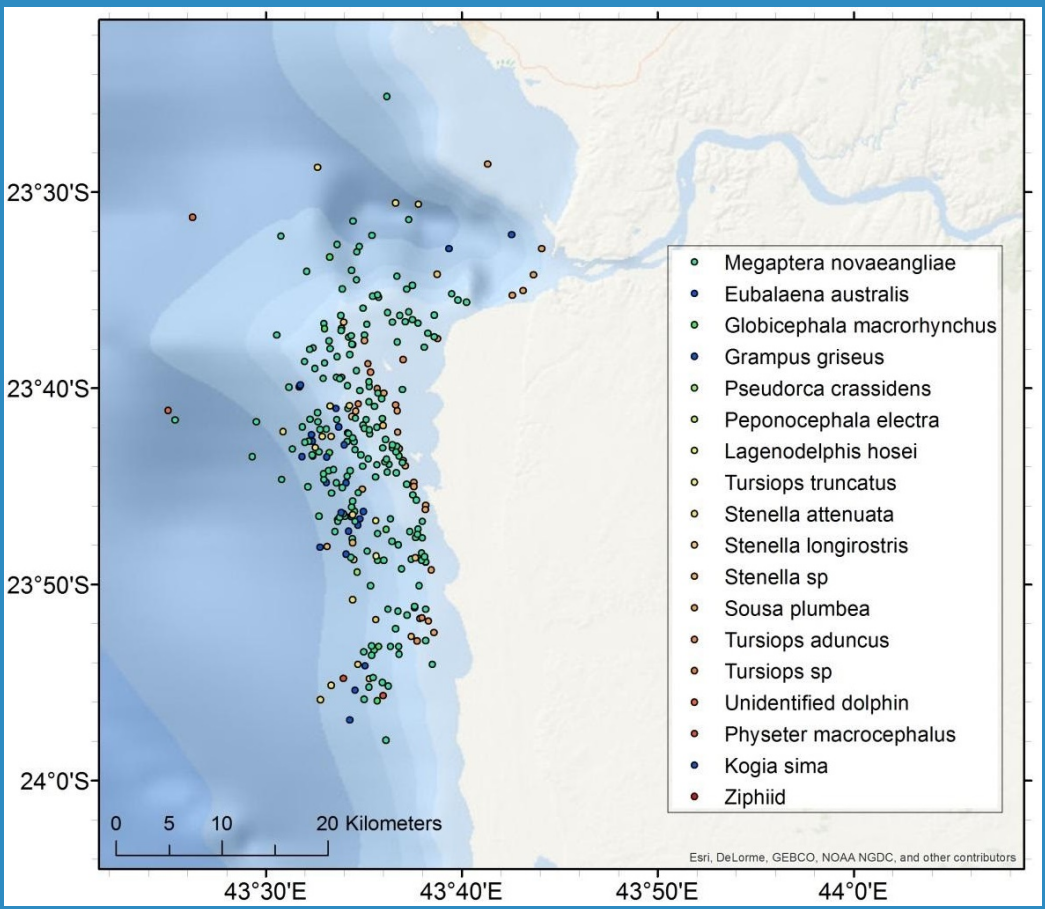

Figure 1: Positions of cetacean sightings off Anakao, 2004-2009 and 2013. (From: Cerchio et al., 2014; Cerchio and Andrianarivelo, unpublished data).

movements is unknown. Photographic identification data collected within the IMMA between 2004 and 2009, indicate relatively few individuals (almost certainly <50) with several re-sighted between years; at least one individual was sighted in four of the five years in which photographic data were collected (Cerchio et al. 2015, Cerchio and Andrianarivelo, unpublished data). Group size was relatively small compared to other areas with a mean of 3.6 individuals and exhibited a declining trend from 2004 to 2013 (Cerchio et al. 2015).

Criterion B: Distribution and Abundance Sub-criterion B2: Aggregations

The St. Augustine submarine canyon supports notable aggregations of several deep water delphinids, including: short-finned pilot whales, *Globicephala macrorhynchus* – on several occasions, large groups have been documented in the Anakao and St. Augustine Canyon area, comprised of 2 or 3 subgroups of 20-40 individuals; Risso's dolphins, *Grampus griseus* – the most commonly sighted oceanic delphinid during small boat-based surveys, found along the steep continental slope and canyon; Spinner dolphins, *Stenella longirostris* – regularly sighted along the shelf break and at times in large groups in excess of 500 individuals, often in association with pantropical spotted dolphins (*Stenella attenuata*) along the edges of the canyon (Cerchio et al., in press).

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

The area is an active breeding area for humpback whales during July to October, with sightings continuing into December (Cerchio et al., 2009; Cerchio et al., 2016; Trudelle et al., 2016). Breeding behaviour was regularly observed and satellite tracks of 11 whales tagged off Anakao indicated extensive movement through the boundaries of the IMMA and along the southern coast of Madagascar to Tôlanaro (Fort Dauphin), in the adjacent areas of Southern Madagascar.

Criterion D: Special Attributes Sub-criterion D2: Diversity

In addition to the species listed previously, the following species are part of the diversity of the area (See Fig. 1): Southern right whale, *Eubalaena australis* – although this species is rarely sighted in the waters of Madagascar, there have been two documented sightings during boat surveys in the area, one of which was a mother-calf. In general, right whales are sighted infrequently but regularly around Madagascar, with anecdotal sightings on both the west and east coasts (Rosenbaum et al., 2001; Cetamada, unpublished data; Cerchio et al., in press). It is unclear whether these individuals represent range expansion from the South Africa population, or potentially represent remnants of an historical and near-extirpated population from Mozambique / Madagascar (Banks et al., 2011; Findlay, pers. comm.), that was heavily hunted off the Crozet Islands (Townsend, 1935); Common bottlenose dolphins, *Tursiops truncatus* – large offshore forms of bottlenose dolphins have been sighted on several occasions during boat surveys and aerial surveys (at times in association with pilot whales), and likely utilize the steep slope and canyon habitat; False killer whale, *Pseudorca crassidens* – sighted on several occasions during boat surveys and aerial surveys, and likely utilize the steep slope and canyon habitat; Sperm whale, *Physeter macrocephalus* – sighted on several occasions during aerial surveys and detected acoustically using dipping hydrophones during boat surveys and documented extensively during passive acoustic monitoring, and likely utilize the steep slope and canyon habitat (Cerchio et al., in press).

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