Title/Name of the area:

The Comoros – Glorieuses crescent (part of the Mozambique Channel)

Presented by (*names, affiliations, title, contact details)*

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Abstract (*in less than 150 words)*

The Comoros archipelago consists of four volcanic islands – Ngazidja (Grande Comore), Moheli, Anjouan and Mayotte. In the centre of the Western Indian Ocean (WIO) area of highest diversity; unusually high species richness of many taxa for an island system: > 270 species of hard corals, 750 fishes and 455 crustaceans. Mayotte has the maximum hydroid species richness known in the region (173 species) and the Millepora family is also more diverse. The Comorian islands are best known biologically for the largest populations of coelacanth in the world.

Introduction

The Comoros archipelago consists of four volcanic islands – Ngazidja (Grande Comore), Moheli, Anjouan and Mayotte. These islands and banks are located in the northern-most section of the Mozambique Channel, and likely are a causal feature in the formation of eddies and of the Comoros gyre. The Glorioso Front was christened for its proximity to Glorieuses island, and may mark the transition from the SEC to the waters of the channel. High levels of connectivity due to the eddies around the Comoros mean the islands may play a key role in maintaining the genetic stock of the channel, and be stepping stones/refuges between the Madagascar and Mozambique coasts.

Location

The three younger islands of the Comoros are in the Republic of Comoros. Mayotte is a Département of France.

Mayotte is formed by two shield volcanoes surrounded by a barrier reef system. The barrier reef is 220 km long with a variable width between 800 and 1500m. It is not continuous, and in the north and west is submerged. The lagoon has an area of 1 100 km², the largest in the region for a high volcanic island, and is up to 12 km wide and 80 m deep. Within the SW lagoon, an internal double barrier reef is present in several segments over a length of over 18 km, a unique feature in the Indian Ocean. Several other reef

formations are present in the lagoon: pinnacles, inner reefs, patch reefs and fringing reefs on the island shores, with a total length of 160 km. To the north the Iris bank extends outside the barrier reef, at depths of 15-30 m.

Feature description of the proposed area

Unlike other parts of the Mozambique channel where water flows in almost any direction, the region around Mayotte, Glorieuse and to the east to the NW Madagascar coast may predominantly experience anticyclonic flow driven by the SEC, the sheltering effect of the tip of Madagascar and the Comoros gyre. Anticylones are warm-core eddies as the direction of flow pushes the thermocline deeper and traps hotter surface water – and this may be a primary causal factor of high sea surface temperature conditions in this NE corner of the Mozambique Channel, that results in higher levels of thermal stress to corals.

Mayotte and the banks may play a role in inducing and stabilizing the dominant anticyclonic flow of the NE corner of the Mozambique Channel, causing higher temperatures in this zone and a particular marine climate with implications on climate vulnerability of marine systems.

The Comorian islands are best known for the largest populations of coelacanth in the world, with largest concentrations on the SW coast of Ngazidja, with notable numbers at Bimbini, Anjouan. In total, a population size of 500 has been estimated for the Comoros, which lies at the northern end of the main known population of coelacanth along the shores of the Mozambique channel from KwaZulu-Natal in the south to southern Tanzania in the north, on the west side, and from Tulear in the south to northern Madagascar on the east side.

Dugong are reported from the Comoros, with the most important sites being on Moheli, and Mitsamiouli on Ngazidja. The islands also host the second largest nesting site for green turtle nesting in the WIO, at Itsamia (Moheli). In common with Mayotte, the Comoros are important for humpback whales from June to November, also with high ratios of mother-calf pairs.

Diversity: In the center of the WIO center of diversity; unusually high species richness of many taxa for an island system: > 270 species of hard corals, 750 fishes and 455 crustaceans. Mayotte has the maximum hydroid species richness known in the region (173 species) and the Millepora family is also more diverse.

Turtles: Green turtles, up to 5000 nesting females a year; hawksbills: up to 100 nesting females a year.

Sharks and Ray: winter abundance of manta rays (Manta alfredi) and scalloped hammerhead sharks (Sphyrna lewini).

Marine mammals: high diversity of marine mammals; important humpback whale mother/calf nursing zone; south lagoon is known to be a breeding site for Megaptera and high diversity of cetaceans. Dugong present in the lagoon. The banks (Geyser, Zélée, Iris) and eastern region of the Comoros may be an important area for humpback whales during the late austral winter months.

Though very poorly known, the coral reef fauna in the Comoros likely covers a diverse range of habitats and morphologies, from the oldest proto-barrier reef formations (Anjouan, Moheli) to coral communities on recent lava flows and emerging seamounts (Ngazidja, Banc Vailheu).

Feature condition and future outlook of the proposed area

Threats

The Comoros is one of the least developed countries in the region, and population growth is leading to rapid increases in direct pressures on the sea for resources, principally food, and in land-based impacts such as pollution and sedimentation. Mayotte has a higher standard of living as its is a region of France, however higher consumption levels, land-based development and greater motorization of fisheries result

in even greater threats to the marine environment. Fishing on the isolated banks (Geyser, Glorieuses) is a growing threat as depletion of fish on the main islands occurs, and increased nearshore management of fisheries pushes illegal fishers farther offshore. The islands are also in the center of highly active zone of oil and gas exploration driven by the neighbouring countries, so is highly vulnerable to impacts over which it has no control. The eastern parts of the Comoros and Mayotte lie in an apparently warmer zone in the northern Mozambique channel, raising the risk of thermal stress and coral bleaching.

The primary threat to coelecanths is renewed and increasing deep benthic fisheries, due to the need to feed the growing island populations.

Conservation

The Tanga Coelecanth Marine Park (northern Tanzania), designated in 2010 specifically to protect the population of coelacanth being affected by fishing (37 individuals caught from 2003-2010) may be key to their survival, though further studies will be needed to determine its efficacy. The isolation of this sub-population suggests that separate actions for conservation of Mozambique channel coelacanth are necessary. The high degree of mixing in the channel presents a classic test case of whether to designate few large or many small protected areas. The existing World Heritage site at iSimangaliso is south of the geographic border of the channel, though is linked by currents moving southwards. However there may not be any return flow of genetic material back into the channel, reducing its role in protecting coelacanth over a broader geographic range. Thus key sites in northern Mozambique and Madagascar, the Comoros, and south Mozambique and Madagascar may be necessary. The Comoros is the dominant population known to date, so is the highest priority for coelacanth protection.

Coral reef, seagrass and mangrove conservation is of strong interest for local livelihoods and security, and biodiversity protection. The Moheli Marine Park protects the most complex and diverse reefs in the Comoros on the south coast of Moheli, but impacts from fishing and terrestrial runoff within the park are very high. In 2011 the entire EEZ of Mayotte was designated as a Marine Protected Area, though zoning is yet to be established. The island has had some small no-take areas established in recent years. In 2012 the entire EEZ of Glorieuses was also established as a Marine Protected Area, excluding fisheries.

Assessment of the area against CBD EBSA Criteria

(Discuss the area in relation to each of the CBD criteria and relate the best available science. Note that a candidate EBSA may qualify on the basis of one or more of the criteria, and that the boundaries of the EBSA need not be defined with exact precision. And modeling may be used to estimate the presence of EBSA attributes. Please note where there are significant information gaps)

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				**X**
Unique oceanographic features - gyres and eddies in the N Mozambique channel; island					

archipelago/active hotspot.					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.				**X**
Marine mammals: high diversity of marine mammals; important humpback whale mother/calf nursing zone; south lagoon is known to be a breeding site for Megaptera and high diversity of cetaceans. Dugong present in the lagoon. The banks (Geyser, Zélée, Iris) and eastern region of the Comoros may be an important area for humpback whales during the late austral winter months.					
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.			**X**	
Turtles: Green turtles, up to 5000 nesting females a year; hawksbills: up to 100 nesting females a year. The Comorian islands are best known for the largest populations of coelacanth in the world, with largest concentrations on the SW coast of Ngazidja, with notable numbers at Bimbini, Anjouan. In total, a population size of 500 has been estimated for the Comoros, which lies at the northern end of the main known population of coelacanth along the shores of the Mozambique channel from KwaZulu-Natal in the south to southern Tanzania in the north, on the west side, and from Tulear in the south to northern Madagascar on the east side.					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.			**X**	
Coral reefs are highly susceptible and fragile to global warming.					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.				**X**
Part of the eddy / upwelling systems of the Mozambique Channel.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				**X**
Diversity: In the center of the WIO center of diversity; unusually high species richness of many taxa for an island system: > 270 species of hard corals, 750 fishes and 455 crustaceans. Mayotte has the maximum hydroid species richness known in the region (173 species) and the Millepora family is also more diverse. *Turtles: Green turtles, up to 5000 nesting females a year; hawksbills: up to 100 nesting females a year.* *Sharks and Ray: winter abundance of manta rays (Manta alfredi) and scalloped hammerhead sharks (Sphyrna lewini).* *Marine mammals: high diversity of marine mammals; important humpback whale mother/calf nursing zone; south lagoon is known to be a breeding site for Megaptera and high diversity of cetaceans. Dugong present in the lagoon. The banks (Geyser, Zélée, Iris) and eastern region of the Comoros may be an important area for humpback whales during the late austral winter months.* *Though very poorly known, the coral reef fauna in the Comoros likely covers a diverse range of habitats*					

and morphologies, from the oldest proto-barrier reef formations (Anjouan, Moheli) to coral communities on recent lava flows and emerging seamounts (Ngazidja, Banc Vailheu).					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.		**X**		
Many locations already highly impacted, but some are still in good natural state.					

Sharing experiences and information applying other criteria (Optional)

Other Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Add relevant criteria					
Explanation for ranking					

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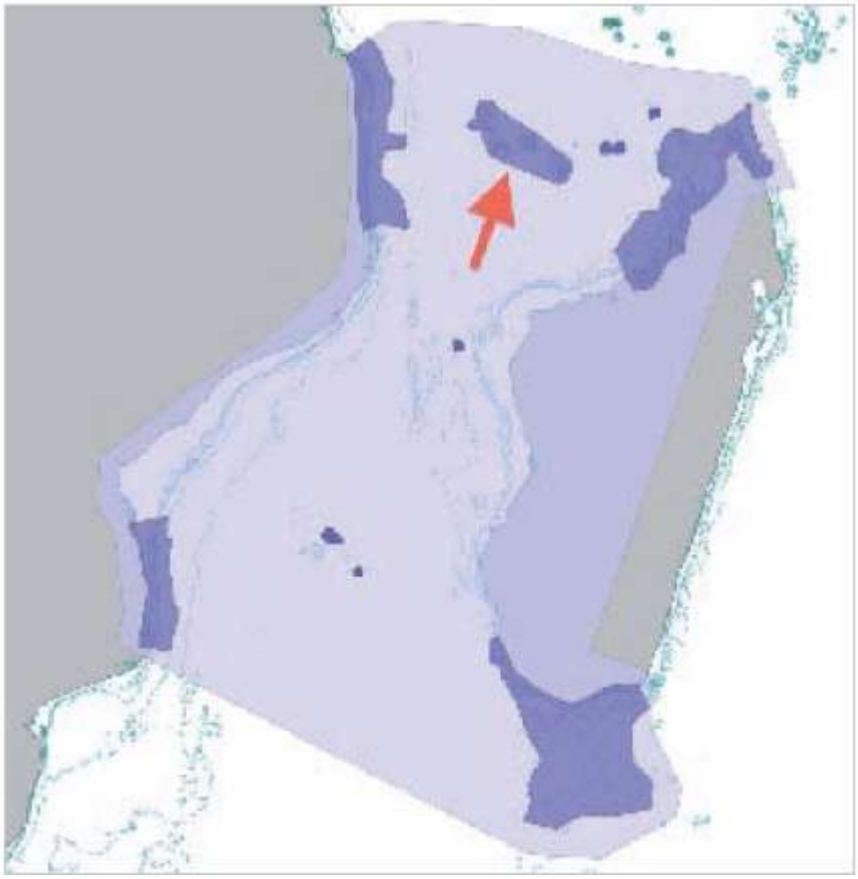
Maps and Figures

Figures below can be provided in higher resolution.



The Comoros – Glorieuses crescent. ©David Obura

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