

Appendix

Template for Submission of Scientific Information to Describe Ecologically or Biologically Significant Marine Areas

*Note: Please **DO NOT** embed tables, graphs, figures, photos, or other artwork within the text manuscript, but please send these as separate files. Captions for figures should be included at the end of the text file, however.*

Title/Name of the area

The Aldabra Atoll, Aldabra Group, Republic of Seychelles

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

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Abstract (in less than 150 words)

The Aldabra Group of islands are raised coral islands, with similar floral and faunal species. Aldabra is a Special reserve and a UNESCO World Heritage Site, under the management of the Seychelles Islands Foundation (SIF). It is scientifically and ecologically valuable as it has a large variety of marine habitats, and diverse fish species, including sharks and rays; marine turtles, dugongs and cetaceans. A number of scientific researches, both marine and terrestrial are underway on and around Aldabra, along with a number of long-term monitoring programmes, amongst which is marine turtle monitoring, which has been active for a number of years. There is a need to maintain those habitats so as to protect all species on Aldabra and prevent destruction, especially in light of threats of sea level rise and global warming.

Introduction

(To include: feature type(s) presented, geographic description, depth range, oceanography, general information data reported, availability of models)

Aldabra is a raised coral atoll, in the Indian Ocean, and forms part of the Aldabra Group of islands within the Republic of Seychelles. Its total land area is about 155km², and when one includes the channel and lagoon area, Aldabra cover almost 340km². It is a Special Reserve and a UNESCO World Heritage Site (1982). Aldabra is administered by a government statutory body, the Seychelles Islands Foundation, which has the role of implementing research and monitoring activities within the Aldabra Protected area. The atoll consist of a ring of four islands which includes the South Island (Grande Terre), Malabar (Middle Island), Polymnie and Picard (West Island). There are also a number of smaller islands and rocks, inside the lagoon, and some small islets at the West Channel, between the South and Polymnie Islands. The largest of the small islets is Ilot Magnan. The Aldabra Islands are made up of limestone uplands, sand dunes and beaches which are remnants of coral reefs.

Location

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(Indicate the geographic location of the area/feature. This should include a location map. It should state if the area is within or outside national jurisdiction, or straddling both. It should also state if the area is wholly or partly in an area that is subject to a submission to the Commission on the Limits of the Continental Shelf)

The Aldabra atoll, is approximately 1066 km south west of the main island of Mahé, 420 km north-west of Madagascar and 640 km east of Tanzania (46°20' E. Long., 9°24' S. Lat.). This area is within the Seychelles national jurisdiction (refer to attached Map)

Feature description of the proposed area

(This should include information about the characteristics of the feature to be proposed, e.g. in terms of physical description (water column feature, benthic feature, or both), biological communities, role in ecosystem function, and then refer to the data/information that is available to support the proposal and whether models are available in the absence of data. This needs to be supported where possible with maps, models, reference to analysis, or the level of research in the area)

There are many factors that make Aldabra ecologically and scientifically valuable. Aldabra is a prime example of a raised coral atoll and is significantly less disturbed than most other atolls in the Indian Ocean and elsewhere in the world. Aldabra is a refuge for many endangered species.

There are several large channels which link Aldabra's large lagoon with the reefs and ocean outside. Of these Grande Passe is the largest, through which about 60% of lagoon water passes in and out at speeds of up to 6 knots at each change of tide. A wide variety of marine habitats is found within the lagoon and through the channels, extending out to the reef flats and fringing coral reefs surrounding the atoll. Beyond the reef there is a gradual slope down to 400 metres or more. The lagoon is an important sheltered site for numerous fish (including sharks and rays) and other marine organisms. Fish life is diverse and even opportunistic spotting of the Dugong although certain invertebrate groups, such as echinoderms, seem to be under-represented. Over 14 species of marine mammals have been reported. Among the more numerous sightings have been humpback whales (*Megaptera novaeangliae*) and spinner dolphins. It has the world's second largest breeding population of greater and lesser frigate birds (*Fregata minor* and *Fregata ariel*).

Some fifty small sandy beaches are scattered along the coastline of Aldabra, especially on the north, west and south coasts. Behind some of them are dunes up to about 15 metres high. Together these beaches form a very important breeding ground for green turtles (*Chelonia mydas*). Some hawksbill turtles (*Eretmochelys imbricata*) also nest there, although this species tends to prefer the small beaches inside the lagoon. Along the inner atoll edge, the lagoon is bordered with mangrove forest, which is more extensive along the eastern edges of the lagoon and is a very important breeding site for greater and lesser frigate birds, and also red-footed boobies. Intertidal mudflats are important feeding grounds for wading birds and shore birds, including migrants. The small lagoon islands and islets are mostly clustered at the western and eastern ends of the lagoon, some of them serving as the only rat-free refuge for ground nesting birds.

As a World Heritage Site, Aldabra provides an outstanding opportunity to study natural ecological and biological processes. Scientific research on Aldabra is extremely important both to the world's information base and to Aldabra's survival. A significant volume of basic research was carried out from 1969 and into the 1980s, which serves as a base for further studies. In addition, several monitoring programmes are in place which provides long-term data on significant species and natural phenomena. While there are many research possibilities and needs, emphasis is given to those studies which provide information on which sound management and conservation can be based.

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Feature condition and future outlook of the proposed area

(Description of the current condition of the area – is this static, declining, improving, what are the particular vulnerabilities? Any planned research/programmes/investigations?)

Under SIF management, Aldabra had some years of achievement, followed since 1989 by a steady deterioration in the infra-structure and in scientific achievements. This decline resulted in an SIF initiative in 1992, supported and financed by the Global Environment Facility (GEF) administered through the World Bank, to renovate the research facilities, purchase a new rapid reaction boat, conduct a goat eradication programme, and prepare and print its current management plan. The SIF has, at the same time, used much of its own financial resources to renovate much of the general infrastructure.

The establishment of zones on Aldabra, limiting the uses for each zone, is considered an important new strategy in the management of the atoll. These include the:

1. Restricted Zone: Sensitive areas for non-manipulative research and monitoring only, with some areas closed seasonally.
2. Protected Zone: The major part of Aldabra, set aside for research and monitoring but with limited access for photographic and other special visitors. Some areas closed seasonally.
3. Tourist Access Zone: The areas designated for educational tourism.

The Conservation objectives are to maintain biodiversity and habitat diversity of coastal ecosystems, including mangrove, beaches, lagoon islets, the protection of turtles and turtle nesting sites, protection of frigate and booby colonies and their nesting areas, and protection of nesting sites of other marine birds.

A number of threats have been identified for Aldabra including sea level rise due to global warming, loss of beaches and smaller islets by erosion, predation by alien species, particularly cats, which eat a variety of coastal animals as well as the spread of rats to small islets that would threaten many nesting sea birds. Also, tourism-related disturbance, for example of nesting turtles and nesting frigate birds, boobies, Caspian terns, crested terns and red-tailed tropic birds; poaching of turtles, turtle eggs, birds and birds' eggs; pollution through oil tanker spills. These represent a potential threat which would be disastrous for Aldabra's turtles, sea birds and mangrove organisms, as well as for other organisms directly or indirectly dependent on the coastal marine habitats. The catastrophic effects of an oil spill (or other toxic waste spill) can extend for hundreds of kilometres and other islands in the area are vital for Aldabra's ecosystems. Also, improper waste disposal, particularly of hazardous waste materials.

Certain management policies are used to ensure adequate management of all species and biodiversity of Aldabra. Marine turtles are strictly protected. Hunting, killing, disturbance of nesting females and taking of turtle eggs are strictly forbidden. All sea birds are protected. Priority species include:

- Turtles. Aldabra is a major Indian Ocean nesting site for green turtles. All turtles are protected by Seychelles law (Wild Animals [Turtles] Protection Regulations). Turtles on Aldabra are being monitored and tagged, including juvenile hawksbill turtles. Other management policies will be defined following the recommendations of Mortimer (1998).
- Frigates and boobies. Aldabra has the second largest breeding population of lesser and greater frigate birds in the world. Visitors are allowed to visit one of the frigate colonies, with SIF guidance, keeping a minimum distance. This policy may change in the light of monitoring results.
- Other seabird species may be subject to full protection.

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- * Caspian tern. Aldabra is the only oceanic breeding site for this tern.
 - * Black-naped tern. Aldabra may be the stronghold for this species in the entire Afro-Malagasy region.
 - * Red-tailed tropic bird. Aldabra is an important breeding site in the Indian Ocean.
 - * Shearwaters. There have been claims and counter-claims of a possible endemic race on Aldabra. Little is known of its population size.
- a) Zonation of the atoll. All seabird and frigate colonies east of Camp Fregate Gionnet are in the Restricted Zone. Other highly sensitive species can be fully protected if necessary, either within the Restricted Zone or seasonally within the Protected Zone.
- b) Long term monitoring:
- Turtles :
 - * Turtle track survey. This gives an indication of the numbers, distribution and timing of turtle nesting activity on Aldabra each year. All nesting beaches should be visited at least once per month, with some beaches being checked 4 to 8 times per month.
 - * Turtle tagging. This is done on a regular basis to help answer questions about turtle behaviour and ecology.
 - * Immature turtles in the lagoon. This provides information on population size, distribution, growth rates and behaviour.
- Beach erosion and accretion. This will help to quantify any long-term changes in coastal zone habitats, particularly beaches. Ideally photographic records should be taken from the photo benchmarks every three months.
- c) Opportunistic and secondary monitoring :
- Effects of tourism on frigate colonies. Specific surveys should be carried out not more than once per month from February to May to assess the impacts resulting from the main tourist season.
 - Caspian terns. Surveys of nesting activity should be conducted twice a year if possible, in the wet and dry seasons.
- d) Tourism policy and regulations.
- e) Policy on poaching.
- f) Oil spill contingency plan. This should ensure that Aldabra is included in the Oil Spill Contingency Plan for Seychelles.
- In the meantime, any major spill should be reported to SIF headquarters
- g) Waste management policy.

Research priorities include:

- a) Lagoon islet surveys.
- b) Effects of tourism policy on frigate and booby colonies.
- c) Shearwater genetics and population studies.

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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	
<i>Explanation for ranking</i> All mangrove species found in the Seychelles, which is very rare and threatened on main granitic islands. Also large population of green turtle all year round, while hawksbill dominate main granitic island. Aldabra also has turtle and dugong feeding sites as well dugongs which are found nowhere else in seychelles. Dugong calf has also been sighted which may suggest Aldabra as a breeding sight. Spotting of about 25 species of cetaceans, including blue whales.					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.			x	
<i>Explanation for ranking</i> Important coral reefs, seagrass beds and mangrove forest.					
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	
<i>Explanation for ranking</i> Areas for green and hawksbill turtles, dugongs and some species of sharks					
Vulnerability, fragility,	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that		x		

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sensitivity, or slow recovery	are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.				
<i>Explanation for ranking</i> Species and habitats similar to above					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.			x	
<i>Explanation for ranking</i> Both mangroves and turtles because of isolation which makes conservation easier as anthropogenic threats are reduced.					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	x			
<i>Explanation for ranking</i> Though there are higher diversity of habitats and ecosystem on Aldabra, compared to islands of Seychelles, studies and research still needs to be carried out to be able to properly compare the difference in diversity					
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	
<i>Explanation for ranking</i> Anthropogenic effects are reduced for Aldabra because of isolation from human, which results in amore natural ecosystems especially in terms of feeding and breeding ground for dugongs, turtles, sharks, rays, cetaceans, birds and other marine species.					

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
<i>Add relevant criteria</i>					

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Explanation for ranking

References

Hermans, A. & Pistorius, P. A 2008, MARINE MAMMAL DIVERSITY IN THE REMOTE WATERS OF ALDABRA, *ATOLL RESEARCH BULLETIN*, NO. 564

Beaver, K, & Gerlach, R 1998, A management plan for Aldabra Atoll, Seychelles Natural World Heritage Site 1998-2005

Mortimer, JA von Brandis, RG Liljevik, A Chapman, R Collie, J 2011, Fall and Rise of Nesting Green Turtles (*Chelonia mydas*) at Aldabra Atoll, Seychelles: Positive Response to Four Decades of Protection (1968–2008) *Chelonian Conservation and Biology*, 10(2):165-176.

Pistorius, P.A. & Taylor, F. E. 2009, Declining catch rates of reef fish in Aldabra's marine protected area, *Aquatic Conservation Marine and Freshwater Ecosystems*. 19: S2–S9

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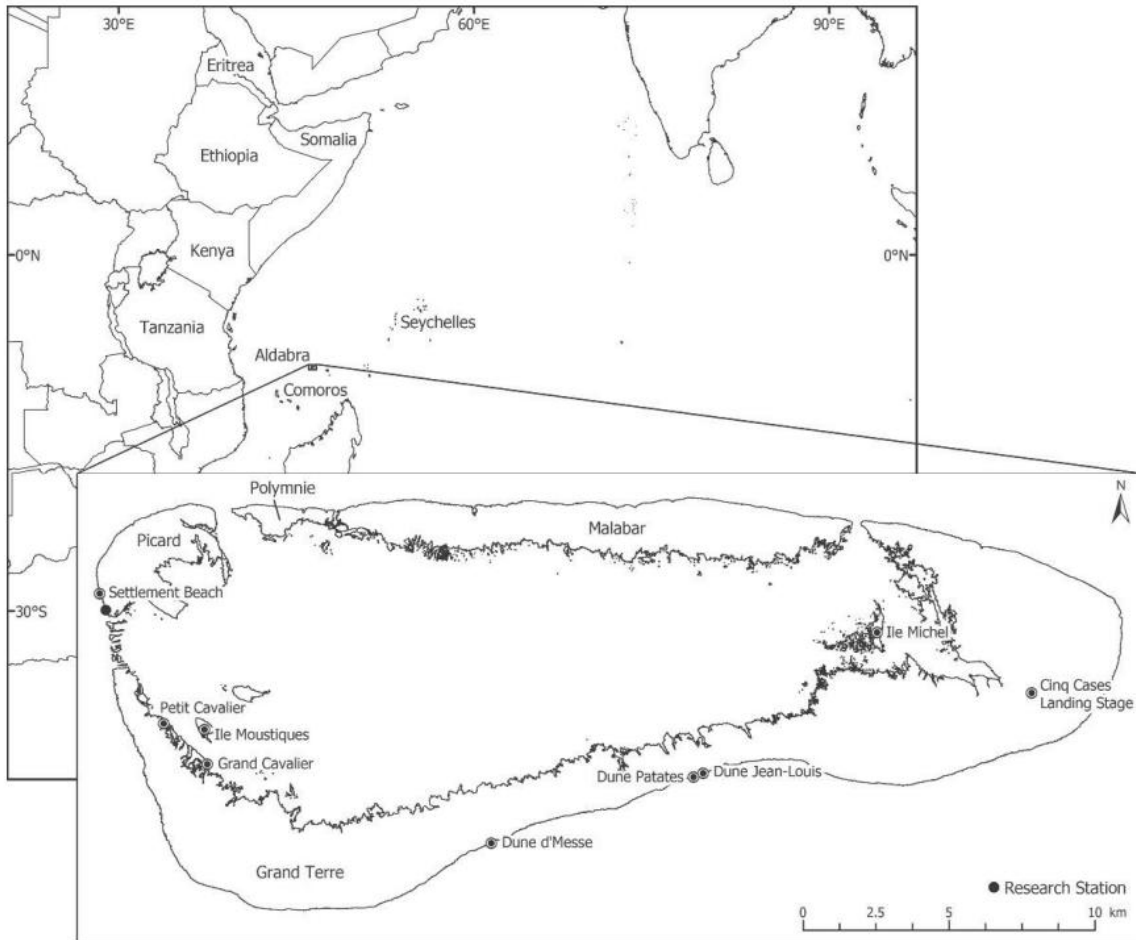


Figure 1. The location of Aldabra in the Western Indian Ocean.

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