UN environment CMS

**MEMORANDUM OF UNDERSTANDING ON THE CONSERVATION AND MANAGEMENT OF MARINE TURTLES AND THEIR HABITATS OF THE INDIAN OCEAN AND SOUTH-EAST ASIA**

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Agenda Item 9.1

# UPDATES ON THE STATUS OF IOSEA NETWORK SITES

## ALDABRA ATOLL

*(Prepared by the Seychelles Islands Foundation)*

# Update on the Status of the IOSEA Network Site
**(Version: 21 August 2019)**

# Aldabra Atoll

**A. Date of submission (DD/MM/YYYY):**
*The date on which the questionnaire was completed.*

26 Sept 2019

**B. Name and address of compiler(s), if not the IOSEA Focal Point**
*Name and contact information (including affiliation) for the individual(s) who prepared this information.*

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**C. Country:** *The name of the country in which the site is located.*

Seychelles

**D. Name of site:** *The name of the site (alternative names should be given in brackets).*

Aldabra Atoll

**1. Have there been changes in the management authority?**
*Name, address and contact details of the body responsible for the direct local conservation and management of the site, if different than in original proposal.*

No. It has been managed by SIF since 1979.

**2. What are the current population numbers and trends for the marine turtle species present at the site?**
*Please insert population numbers for each species present and the year when the population was estimated, as well as the population trend (e.g. stable, increasing, decreasing, unknown)*

The last population estimate produced for green turtles is with data from 2004–2008, and it estimated 3100–5225 females nesting annually (Mortimer et al. 2011). This was part of a long-term analysis from 1968 to 2008, and the data represents a 500–800 % increase for those 40 years (Mortimer et al. 2011). Annual trends point to an increasing population on one of the index nesting beaches, and it is being analysed to a higher level. A new population estimate is being conducted and aimed to have published in 2020.

For hawksbill nesting turtles, there has not been an estimate due to the low numbers and not monitoring their main nesting beaches (beaches in the inside of the lagoon) often enough for accurate estimates.

**3. Have there been any changes in land/sea ownership, protected status, legislation and/or governance framework, which affect the site?**

*Describe any changes to legislation / regulations relevant to the protection / conservation of marine turtles and their habitats at this site, and comment on their effectiveness.*

*Mention any changes in nationally relevant protected area status, international conservation designations and, in the case of transboundary sites, bilateral or multilateral conservation measures which pertain to all or part of the site since 2014. If a protected area or reserve has been established (at a national/regional level), give the date of its establishment and size. If only a part of the site is included within a protected area, the area of marine turtle habitat that is protected should be noted.*

*New International designations since 2014 may include sites listed under the UNESCO/World Heritage Convention, Man and Biosphere Reserve Network, Ramsar Convention, other site conservation networks, etc. Where appropriate, list the IUCN (1994) protected areas management category(ies) that apply to the site.*

Since the 1980s, Aldabra Atoll has been highly protected through its Special Reserve and UNESCO World Heritage Site designations. By 2014, it had received further designations including an Important Bird Area through BirdLife International (1998), a Ramsar Wetland Site of International Importance by the Ramsar Convention (2010) and an IOSEA marine turtle site (2014). All these protections and designations allowed the atoll to be protected for its biodiversity, leading to protection of the land, lagoon, and surrounding reefs. It has been documented how the protection in the 1980s especially for green turtles, allowed the population to start recovering at incredible rates (Mortimer et al. 2010). These further designations have given the atoll more credit towards the unique flora and fauna of the atoll, giving the atoll further recognition and attention, and leading to widening of the protected area. In 2018, Aldabra National Park was gazetted to include the whole Aldabra group (Cosmoledo, Astove and Assomption). This represents an increase by over 74,000 sq. kilometres of protected water, further strengthening the legal protection of the migratory pathways as well as nesting habitat in the outer islands of the Seychelles.

**4. What are currently the most important threats to marine turtles and their habitat at the site?**

*Describe the human and natural factors negatively affecting the ecological character of the site, both within and in the vicinity of the site. These may include new or changing activities/uses, major development projects etc., which have had, are having, or may have a detrimental effect on the natural ecological character of the site. For example, describe in terms of the percentage of coastline (or other area) modified/affected by a particular threat; for egg collection, describe in terms of number of nests, per species, per year. Mention also data-deficient threats, where a threat is known to be present but is not quantified. Collectively, this information should provide a basis for monitoring of ecological character of the site.*

**Sea turtle poaching**

None since SIF became management (1979) and since Aldabra was given increased protection (1981, 1982). Aldabra Atoll does have a history of poaching.

**Climate change**

Climate change poses serious indirect threats to Aldabra's turtle population via sea level rise and therefore coastal erosion of beach habitats and coral bleaching, which will impact on two of the turtles' key habitats on Aldabra. These threats have not yet been possible to quantify cannot be disregarded.

**Pollution**

The global issue of marine debris is also present on Aldabra. Washed ashore marine debris covers nesting beaches and poses a large obstruction to nesting females as well as to hatchlings. Additionally, the atoll hosts large stretches of reef (inside and outside of the lagoon), mangrove forests (inside the lagoon) and sea grass beds (inside and outside of the lagoon). These are foraging habitat to a huge aggregation of green turtles of various life stages (juveniles, sub-adults, adult females, and adult males). Recent research has shown in the Mediterranean, that not only are sea turtles ingesting plastics, but are specifically ingesting plastics that are similar to that of sea grass, impacting green turtles (Duncan et al. 2019). This confirms that plastics and marine debris may pose a large threat to the turtles around the atoll. The habitat is also used by a

smaller, but still important, aggregation of hawksbills. Plastic ingestion can also be a serious threat to this species as well.

**Invasive Alien Species**

Aldabra has both introduced rats *Rattus rattus* and cats *Felis catus* and both of these species are known to prey upon turtle eggs and hatchlings. While cats only occur on Grande Terre, some cats caught on this island have had only turtle hatchlings in their stomachs. Rats are a frequent predator of turtle nest sand hatchlings on all islands they are present. While Aldabra's green turtle population is increasing, it is entirely plausible that it could be increasing more rapidly, or that the atoll could host a larger population of hawksbill turtles, if cats and rats were removed. Eradication of these two invasive alien species is a key management plan for Aldabra in the future.

**Natural Hazards**

Aldabra is a raised limestone reef, mostly made of champignon (reef rock) and platin (smooth limestone). Along the coast are rugged champignon limestone cliffs. In between these cliffs are nesting beaches, which somewhat have a sandy ramp for getting up to the beach from the ocean. Depending on the wind season, these beaches can accrete and erode; when they erode, champignon is exposed. Additionally, the path of getting from the ocean to the beach can be narrow, with the beach wider than the entrance. If a turtle is able to navigate up to the beach and does not return to the ocean via the same path, it will have to traverse over the champignon sections in order to then be able to dump back into the ocean. Additionally, the tidal changes of the atoll change the accessibility. During high tide, the high water allows easy movement from the reef edge to the coastal edge; however at low tide, stretches from the coastline to the reef (at some times up to 80m) can go dry. Also with the falling tide, rocks and barriers are exposed which weren't before. It is not an uncommon sight, especially during peak season, to find a female who has become lodged within the champignon and unable to move (therefore fated to a slow death) or a female who has been caught on a tidal flat at low tide and is exposed to the sun until the next tide. In a study from 1995 – 2008 on Aldabra, 158 adult green turtles were recorded dead or trapped. Entrapment/incapacitation was found to be the main cause of death (n=121). For the nesting population estimates at the time, the high end of the estimated number of females affected by these natural hazards was only for 1 % of the population (Mortimer & von Brandis 2013).

**Illegal fishing in the area: coral damage and bycatch**

Fishing aggregation devices (FADs) wash ashore, both along the fringing reef and inside the lagoon, often getting stuck on the reef. These pose a threat for sea turtles to get entangled upon. Additionally, in August 2018, a loggerhead (*Caretta caretta*) sea turtle was found washed ashore on the south coast, life threateningly injured, entangled in long-line fishing gear. As there is no fishing in the reserve and illegal fishing is rarely recoded, this was most likely ghost net and line.

There have been studies demonstrating the negative and extremely damaging effect that nets and fishing gear have on reefs, causing tissue loss and fragmentation in reef corals (Ballesteros et al. 2018) which may also be happening here.

**Habitat destruction/modification**

Aldabra Atoll's remoteness and protection safeguard it from landward habitat destruction and modification. Plastic, ghost nets, and other marine debris pose a threat for habitat destruction.

**Socio economic factors**

None.

## 5. New conservation and management interventions taken since 2014 and measures planned for near future

*Describe conservation and management interventions taken at the site to address threats since 2014. Any application of coastal and marine spatial planning, or integrated coastal/marine zone management planning, involving or affecting the site should be noted.*

*Describe any other new conservation measures taken at the site, such as restrictions on development, management practices beneficial to wildlife, closures of fishing, etc. (Note that information on any monitoring schemes and survey*

*methods should be given under point 19, below.)*

*Where applicable, describe public outreach and communication activities. In addition, if applicable, describe any new developments in the involvement of local communities and indigenous people in the participatory management of the site, including co-management activities, surveillance and enforcement, and performance evaluation since 2014.*

There have not been new threats since 2014, due to the protection already afforded to the atoll and its wildlife. Global threats such as climate change and marine debris do pose a threat.

The Aldabra Management Plan was recently reviewed and the 2016 plan includes zoning for conservation purposes and also to allow sustainable fishing and tourism to be monitored. Tourism activities are very limited and do not allow access throughout the majority of the lagoon, where there are abundances of sea turtles foraging.

In the management plan, marine turtles are identified as key performance indicators and World Heritage criteria. A whole section covering their current conditions, existing and potential pressures, and current major pressures, along with the management objective, management strategies, performance measures, as well as targets have been listed in detail.

In Feb/March 2019, a the Aldabra Clean Up Project (ACUP), a joint initiative between SIF and the University of Oxford, allowed for 12 volunteers to come to the atoll to pick up marine debris from sea turtle nesting beaches. In a 5 week period, the team collected 25 tonnes of marine debris, which was all taken back to Mahé. The ACUP was not only about collecting and removing the trash, but they have done a lot of public outreach and are researching ways to dispose of the marine debris (looking for partnerships to keep the trash from sitting in landfills) and also hoping to spark about waste management in the region. There will be another ACUP in a few years' time to continue what they started.

Aldabra is and has been highly protected. With just SIF staff residing on the atoll at the Research Station, development of the atoll is not an issue. There are no indigenous groups or villages. SIF spends a large amount of time doing outreach and communication and has a dedicated staff member on Mahé for that job. Social media pages (Facebook, Instagram, Twitter) as well as SIF newsletters are constantly updated with what is happening on the atoll including monitoring and research outcomes. Staff and researchers also attend conferences to get information out about the atoll. Additionally, once a year, SIF holds school competitions in order to bring twelve students (of various ages) to Aldabra for nearly a week, in which they learn about the atoll and all the conservation work that is being put into it.

## 6. Current / proposed scientific research and monitoring since 2014

*Name current and/or proposed scientific research projects and their start and end dates, relating to marine turtles and their habitats. Please describe monitoring activities (e.g., tagging, satellite tracking, genetic sampling, nesting and foraging ground surveys, ongoing beach monitoring, etc.). Cite relevant published papers in support of the submission.*

Long term: Long-term beach monitoring has taken place since 1970s, following similar methodologies up to current monitoring. These track counts allow trends to be looked at annually through internal reports. A publication of data analysed from 1968–2008 was published, documenting a 300–500% increase in nesting numbers since monitoring began (Mortimer et al. 2011). Analysis of the green turtle nesting data is currently being carried on through a Master's student at the University of Exeter, to derive an updated population estimate and to inform Aldabra management about the monitoring programme in general. A publication is expected to be drafted by the end of 2019.

Long term: Additionally, there is a night tagging programme in which Inconel tags are attached to nesting females to obtain recapture information.

2019 : There is also a long-term in-water programme which has targeted juveniles (greens and hawksbills). The same programme is ongoing and data goes back to 1996. The long-term data is in the process of being analysed.

Sand samples were collected in 2018 for a different Master's student at University of Exeter, who is analysing microplastics in the top layer of sand at nesting beaches around the world. Samples were sent to her and she is mid-way through analysing all the samples from the various nesting beaches.

## 7. Briefly describe current financial as well as capacity-building needs

*Identify fundraising and capacity building needs for the site (e.g. in relation to monitoring, management interventions, surveillance and enforcement, and performance evaluation).*

Financial needs /Fundraising: permanent monitoring is secured via an operational budget and any additional activities and research needs fund raising.

The permanent monitoring of turtle beaches through track counts is performed by paid staff. The research team on Aldabra consists of rangers to varying educational levels and a science coordinator. With the logistics team (island manager, skippers, engineer, mechanic, technicians), the beaches are able to be accessed. Many of the nesting beaches are remote and difficult to access therefore are monitored once a month when possible. There are two index beaches: settlement beach (adjacent to the research station) and west Grande Terre beaches (1-22; requires taking a boat). Settlement beach is monitored daily while the others are subject to boat availability, weather, and tide level. It is logistically difficult to always meet the monthly aims of turtle monitoring

Additional financing is needed to continue the long-term monitoring programme as well as be able to expand in areas. The next step for turtle conservation on Aldabra would be to have more targeted projects to take place, including and not limited to more tracking of individual movements to make sense of the eight previously tracked turtles and extend this, genetic studies to deduce the regions the Aldabra stock is coming from, and fine-scale movement research to determine how the turtles use their habitat and what they are specifically foraging on.

These studies are beyond what SIF can currently support and would need additional funding to execute. Further information about the mixed aggregations seen on Aldabra would allow further understanding as well as action to take place. The turtles around Aldabra are highly protected, but turtles are migratory, and are therefore not protected in all their travels. Understanding connectivity is crucial in understanding migratory species, and thus in turn protecting them.

## 8. References since 2014

*List any new references relevant to marine turtle records and to the site, including management plans, major scientific reports, scientific articles and bibliographies. When a large body of published material on the site is available, only the most important references need be cited, with priority being given to recent literature containing extensive bibliographies. Reprints or copies of the most important literature should be appended whenever possible. Provide website addresses of references where available.*


- **Aldabra Atoll Management Plan 2016** https://www.sif.sc/sites/default/files/downloads/Aldabra%20Atoll%20Management%20Plan.pdf
- **PANORAMA solution: Protection of nesting beaches to prevent extinction of green turtles on Aldabra Atoll** https://panorama.solutions/en/solution/protection-nesting-beaches-prevent-extinction-green-turtles-aldabra-atoll
- **Aldabra Atoll – Biosecurity challenges and progress** https://www.sif.sc/sites/default/files/downloads/SIF%20biosecurity%20poster%20without%20cropmarks.pdf