



## Republic of Seychelles



## Sixth National Report to the Convention on Biological Diversity

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## PROCESS

This report was produced with the assistance of the United Nations Environment Programme (UNEP)

The report was developed, drafted and compiled in consultation with Stakeholders including many individual meetings, consultations and much correspondence.

Two National Stakeholder Workshops were also undertaken which discussed and approved the content of Section III of the report and provided material for and advice on the rest of the report.



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## SECTION I

**I. Information on the targets being pursued at the national level**

☐ My country has adopted national biodiversity targets or equivalent commitments in line with the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets

or

☒ My country has not adopted national biodiversity targets and is reporting progress using the Aichi Biodiversity Targets for reference. (***Move to section II. In section III, the Aichi Biodiversity Targets should be used for the purpose of this report as the national targets and progress should be assessed towards their achievement in the national context.***)

## SECTION II

### Section II. Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

#### I. Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

##### 1.1. Governance

#### For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

The governance framework has by its very nature has a broad almost comprehensive cross-cutting relevance to the ABTs. In this report, however we will be referring primarily to legislation and policy initiatives and in that context it has particular relevance to ABTs: 2, 5, 6, 8 – 11 & 16.

#### Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective
- ☐ Measure taken has been ineffective
- ☐ Unknown

#### Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

A lot of work has been undertaken during this reporting period on the review and updating of legislation and policy/strategic documents that pertains directly and indirectly to the conservation and sustainable use of biodiversity.

Major initiatives have been launched such as the Seychelles Blue Economy Roadmap, launching of the second NBSAP, developments of new National Access and Benefit sharing Policy, the development of the Seychelles Marine Spatial Plan Policy and the stakeholder-driven process to identify and designate the areas for protection under the marine spatial plan (see **Section II 1.4**).

However, problems have been encountered e.g. intentions to better harmonise certain pieces of legislation have not been realised and extended delays have been experienced in the review and drafting of certain new bills. Key problems have been experienced in the implementation of national strategic documents and finally Seychelles has fallen short of meeting certain of its international commitments.

### Relevant websites, web links and files

See Below.

**Other relevant information**, including case studies to illustrate how the measure taken has resulted in (or is expected to result in) outcomes that contribute to the implementation of the NBSAP.

Legislation. Seychelles has reviewed and updated its 1994 Environmental Protection Act with the promulgation of the new EPA in 2016. The new EPA has significant additional powers in the marine domain (see **Table 4 – Section II 1.3**) including powers to protect coral reefs. The EPA plays a key role in mainstreaming Biodiversity concerns into development planning (See **Section III ABT 2**) it does this in conjunction with the 1970 Town and Country Planning Act (TCPA). It was intended to revise the TCPA and EPA at the same time and take the opportunity to better harmonise their provisions thereby enabling a more effective and efficient pursuit of sustainable development. This unfortunately was not realised. The revisions were undertaken separately and the TCPA review experienced delay and its proposed replacement the Physical Planning Act is still in an early draft Bill stage. The EPA also addresses environmental standards and pollution control.

Other positive initiatives include the:

- The revision and updating of the National Parks and Nature Conservancy Act – the country's principal protected Area legislation to update it and bring it into line with best current international practice. This process is ongoing.
- The National Biosecurity Agency (NBA) was established on November 1, 2016 (See **Section II 1.6** and **Box 2** therein) and is currently being updated to include better risk assessment measures and new international best practices in the field of biosecurity and biosafety.
- The Development of Access and Benefit Sharing Act and subsidiary regulations. This process is ongoing.
- Review of the national Coco De Mer Management Decree and listing of the Coco de Mer Kernel onto the CITES Appendix.

### National Strategies and Policies.

Seychelles has pioneered the Blue Economy Concept internationally as a means to sustainably manage our oceans. Seychelles developed the Blue Economy Concept paper that was later adopted by the United Nations. Seychelles has continued on this route developing its:

- Blue Economy Strategic Policy Framework and Roadmap (2018-2030) with the Commonwealth Secretariat, and
- Marine spatial Plan Policy and Action Plan with The Nature Conservancy (See **Section II 1.4**).

Seychelles has experienced difficulties in other areas however. Its second National Biodiversity Strategy and Action Plan (2015-2020) was developed on time and Aichi aligned in its format, whilst it has been implemented, it has yet to be effectively utilised as the national strategic document in a practice (see **Section III ABT 17**). The Seychelles Sustainable Development Strategy (SSDS 2012-2020) was also not activated and ultimately retired in 2017 and is expected to be replaced by a new National Development Strategy. Likewise the Seychelles National Plan of Action for the Conservation and Management of Sharks (2016-2020) has had delayed implementation.



Finally Seychelles has fallen short of meeting certain of its international commitments in particular with regard to:

- The Cartagena Protocol on Biosafety – the institutional framework has not been instituted and no national law has yet been promulgated.
- CITES where key regulations have yet to be domesticated into national legislation and in many cases. A draft Bill is being finalised.
- The Convention on Migratory Species (CMS) where several Appendix I (e.g. Mobulids) species have still not received protection under national law.

#### **Relevant websites, web links and files**

Seychelles/UN Blue Economy concept paper:

<https://sustainabledevelopment.un.org/content/documents/29788Econcept.pdf>

Seychelles' Blue Economy Strategic Policy Framework and Roadmap (2018-2030). <https://seymsp.com/wp-content/uploads/2018/05/CommonwealthSecretariat-12pp-RoadMap-Brochure.pdf>

Seychelles Blue Economy Strategic Roadmap and Implementation.

<https://thecommonwealth.org/project/seychelles-blue-economy-strategic-roadmap-and-implementation>

Seychelles NPOA-sharks (2016-2020). <http://seatizens.sc/download/seychelles-national-plan-of-action-for-the-conservation-and-management-of-sharks/>

Environment Protection Act (2016). <https://seylli.org/sc/legislation/act/2016/18>

Town and Country Planning Act (1970). <https://seylli.org/sc/legislation/consolidated-act/237>

National Parks and Nature Conservancy Act (1969). <https://seylli.org/sc/legislation/consolidated-act/141>

#### **Obstacles and scientific and technical needs related to the measure taken:**

The issues faced here pertain to lack of capacity and high staff turnover in administration of certain key agencies including the Office of the Attorney General. In certain cases there is a lack of strategic leadership and limited continuity in works that have been ongoing for a long period of time.

#### **Relevant websites, web links and files**

N/A

## 1.2. Public Education and Awareness of the importance and value of Biodiversity and its Conservation and Sustainable Use.

### For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

This implementation measure primarily supports Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

This implementation measure also provides broad crosscutting support to other targets notably ABT 4, 8, 9, 14 and 19.

### Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective
- ☐ Measure taken has been ineffective
- ☐ Unknown

### Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

Public awareness of the importance of issues pertaining to the conservation and sustainable use of biological diversity, is considered to be high. This despite there being no national database or indices from which to accurately assess public awareness of such issues and changing the level of their awareness through time (**see section on Obstacles below**). Seychelles has a long-standing integrated approach to environmental education (**see below**). The growth in the registration and activities of environmental NGOs as well as broader public initiatives indicates that societal awareness is high (**see below**). Public awareness however does not always translate in to action this is perhaps best apparent with regard to the ongoing issue of public littering (**see below**). A shortcoming in the national implementation is clearly the lack of a structured scientific approach to public education and awareness programs, where a baseline of public knowledge is established before the design and implementation of the specific education program, and then assessed again post program in order to determine the efficacy of the initiative. There is also no database on past and current educational programs in this domain, meaning campaigns may often be repetitive or start again from first principles in cases where that may not be necessary.

**Relevant websites, web links and files** (see below)

### Other relevant information.

Seychelles has integrated environmental education into the broader national educational curriculum since the mid-1990s. This approach sees environmental questions being utilised in mathematics classes, science classes etc... in order to inculcate a broad and crosscutting understanding of environmental and biodiversity

issues in students. Likewise there has been a concerted national media effort over the last 25+ years to educate the public on the value and importance of biodiversity and the progress that Seychelles has made in conserving and sustainably using its biological diversity. This has taken the form of regular weekly television programmes based on environment, radio programmes, regular newspaper columns and infomercials on the national television station. The choice of national media in Seychelles is limited and therefore television and radio channels realise high societal penetration (**Bunbury *et al* 2019, Nevill 2001**).

The two main newspapers in the country are the “Seychelles Nation” and “Today in Seychelles” they both have dedicated environment pages and columns on a weekly basis whilst also reporting main environment news as national news items.

**Table 1. Print and Digital Press**

Printing House	Seychelles Nation	Today in Seychelles
Weekly Circulation	18,000 print	15,600 print 22,800 digital
Dedicated Biodiversity coverage	Weekly (Mondays) dedicated environment page that has been in operation for > 20 years.	Weekly (Thursdays) dedicated environment page/column since papers inception in 2011
Trend in last 5 years	Biodiversity coverage has increased considerably over the past 5 years including front page headlines reflecting growing interest and community action in this domain. There is also a full page dedicated to Environment issues each week.	A slight downward trend in dedicated coverage but this is because environment issues are increasingly covered as main news items under that heading. There is the intention to increase dedicated specialised articles for the weekly features.
Other media.	The paper has a website <a href="http://www.nation.sc/">http://www.nation.sc/</a> with dedicated environment and Blue Economy pages: <a href="http://www.nation.sc/category/3/environment">http://www.nation.sc/category/3/environment</a> <a href="http://www.nation.sc/category/4/blue-economy">http://www.nation.sc/category/4/blue-economy</a>	Produces a quarterly glossy magazine entitled SEA Life, Seychelles.  This has 3,000 print each quarter and promotes all aspects of marine conservation and sustainable use in Seychelles.  Active Facebook page with > 20,000 followers: <a href="https://www.facebook.com/todayinseyl/">https://www.facebook.com/todayinseyl/</a>
The Seychelles News Agency is a national dedicated digital news outlet ( <a href="http://www.seychellesnewsagency.com/">http://www.seychellesnewsagency.com/</a> ) with a dedicated Environment Page		

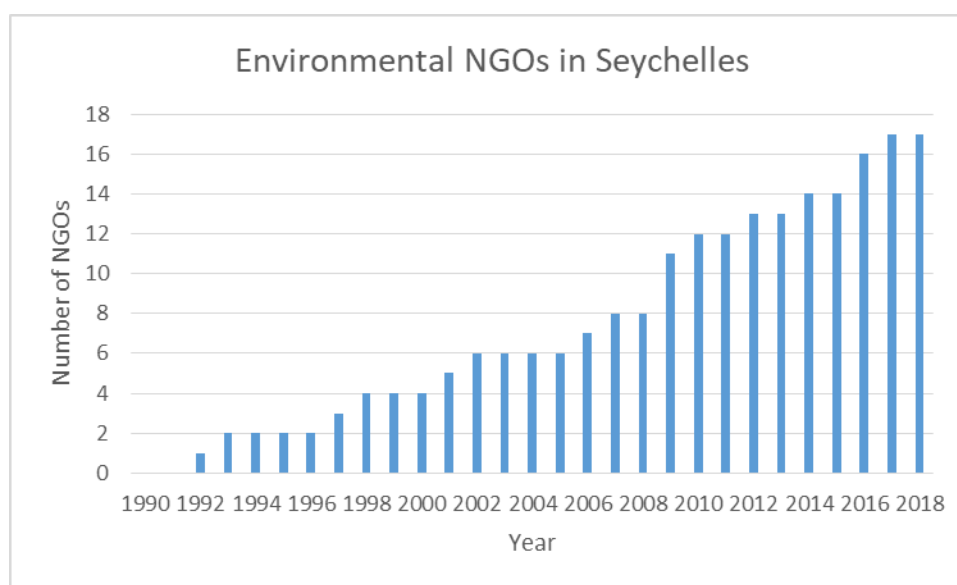
(<http://www.seychellesnewsagency.com/articles/category/4/Environment>) and a Facebook page (<https://www.facebook.com/seychellesnewsagency/>) with > 13,000 followers.

The main national Television and radio channels of the Seychelles Broadcasting Corporation (SBC) also have regular environment magazine programmes<sup>1</sup>.

What is clear however is that communicating the importance of biodiversity is not the same as engendering a change in public behaviour. This is very apparent for example with regard to campaigns against public littering and solid waste dumping. National educational anti-littering campaigns have been undertaken for years, yet casual littering in public places is an ongoing and may be a worsening problem. This does not reflect lack of public knowledge on the issue but rather a laissez-faire attitude. When asking people about their attitude to littering a common glib refrain is: “People are paid to pick up the litter, if I stop littering they will be out of a job.” Such an attitude, in a country which depends upon its natural beauty to support the tourism industry which is its primary source of revenue, speaks to perhaps deeper societal issues that will need to be addressed beyond simple public awareness. However this represents a small proportion of the population.

Issues of solid waste aside, public awareness of, and concern for, the conservation and sustainable use of biological diversity has clearly been raised across society over the last 20 years. This can be seen particularly in the growth of biodiversity-related non-governmental organisations (NGOs), see below. Most of these organisations operate public education campaigns not least through digital media. Prominent NGO websites are listed in the website section below.

**Figure 1. Increase over time of Environmental NGOs in Seychelles**



<sup>1</sup> Details are not available as SBC did not reply to enquiries related to this reporting process.

There have also been two very high profile national campaigns against large tourism developments in recent years led by civil society. These successfully halted major investments, one of which (Cap Ternay hotel development) was to intrude in part upon a protected area and the other was a major development of the last intact freshwater (mountaintop to coast) ecosystem (Grande Police, Mahe). These proposed developments engendered strong public opposition campaigns on the basis of the threat they posed to biodiversity and concerns about public access rights to these sites.

#### **Relevant websites, web links and files:**

Civil Society Campaigns:

Grand Police Citizens Initiative: [https://www.facebook.com/pg/SezGPCI/about/?ref=page\\_internal](https://www.facebook.com/pg/SezGPCI/about/?ref=page_internal)

NGO websites:

Environment Education Association Seychelles (EEAS) (Registered 2013):

<https://www.facebook.com/Environment-Education-Association-Seychelles-500012833506101/>

Green Islands Foundation (GIF) (Registered 2006): <https://www.facebook.com/greenislandsfoundation> & <https://greenislandsfoundation.blogspot.com>

Island Conservation Society (ICS) (Registered 2001): <https://www.islandconservationseychelles.com> & <https://www.facebook.com/IslandConservationSociety/>

Marine Conservation Society, Seychelles (MCSS) (Registered 1997): <http://www.mcsc.sc> & <https://www.facebook.com/MarineConservationSocietySeychelles>

Nature Seychelles (Registered 1998): <http://natureseychelles.org/> & <https://www.facebook.com/natureseychelles/>

Plant Conservation Action Group (PCA) (Registered 2002): <http://www.pcaseychelles.org> & <https://www.facebook.com/pcagroup2018/>

Seychelles Sustainable Tourism Foundation (SSTF) (Registered 2017): <http://seychellessustainable.org/> & <https://www.facebook.com/Seychellessustainable/>

Sustainability for Seychelles (S4S) (Registered 2007): <http://www.s4seychelles.com/> & <https://www.facebook.com/s4seychelles/>

Terrestrial Restoration Action Society of Seychelles (TRASS) (Registered 2009): <https://www.facebook.com/TerrestrialRestorationActionSocietyofSeychelles/>

The Ocean Project, Seychelles (TOP) (Registered 2016): <http://www.theoceanprojectseychelles.com/> & <https://www.facebook.com/theoceanproject.sey/>

WildLife Clubs of Seychelles (WCS) (Registered 1994): <https://www.wildlifeclubsofseychelles.org> & <https://www.facebook.com/Wildlife-Clubs-of-Seychelles-136612136380257>

## References:

Bunbury, N. *et al* (2019). Five eradications, three species, three islands: overview, insights and recommendations from invasive bird eradications in the Seychelles. In: Veitch, C.R., Clout, M.N., Martin, A.R., Russell, J.C. and West, C.J. (eds.) (2019). Island invasives: scaling up to meet the challenge. Occasional Paper SSC no. 62. Gland, Switzerland: IUCN. xiv + 734pp. ISBN: 978-2-8317-1962-7  
<https://doi.org/10.2305/IUCN.CH.2019.SSC-OP.62.en>

Nevill, J.E.G. (2001). Using the Media to Create Awareness and Support for Management of Invasive Species: the Seychelles Experience. In: Wittenberg, R. & Cock, M.J.W. (eds.) 2001. Invasive Alien Species: A Toolkit of Best Prevention and Management Practices. CAN International, Wallingford, Oxon, UK, xvii – 228. ISBN 0 85199 569 1. <https://www.cbd.int/doc/pa/tools/Invasive%20Alien%20Species%20Toolkit.pdf>

**Obstacles and scientific and technical needs related to the measure taken:**

During preparation of this report it became apparent that the lead national agency for public education and awareness on biodiversity-related issues, the division of Public Education and Community Outreach (PECO) in the Ministry of Environment, Energy and Climate Change (MEECC), does not maintain a complete database on all national initiatives or a baseline to fully assess change in public awareness of biodiversity-related issues. Whilst a lot is being done, records of all these efforts are not being maintained which makes it difficult to report. This falls short of the clear provision for such measures outlined in the strategic plan (SSDS) it follows. Moreover it was observed that the current approach does not necessarily promote scientifically sound and structured public education and awareness campaigns which enable the level of public awareness and the degree of efficacy of a particular campaign to be assessed and measured over time. It is strongly recommended therefore that such monitoring regimes be put in place and databases established to assess the status and trends of public education and awareness on biodiversity issues in Seychelles and their impact upon the general understanding of such issues by the general public, the private sector and decision-makers.

**Relevant websites, web links and files**

N/A

### 1.3. Management of Marine Biodiversity.

**For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes**

This implementation measure primarily supports Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

This implementation measure also provides support to Targets 4, 5, 10, 12 and 14.

**Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:**

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective
- ☐ Measure taken has been ineffective
- ☐ Unknown

**Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above**

Various enabling measures have been put in place in recent years to support the sound management of marine biodiversity and fisheries. These include the 2014 Fisheries Act (GoS, 2014) which allows for co-management initiatives, the Mahé Plateau demersal fishery management plan, the ongoing development of the Seychelles Marine Spatial Plan (see **Section II 1.4**), the development of the Blue Economy roadmap for Seychelles, and the development of highly innovative new financing mechanism to support marine conservation, sustainable use and research (See **Section II 1.9**). These activities all bode well for the future. Current trends in fishery catch, specific catch management initiatives and ecosystem quality however continue to be negative.

**Relevant websites, web links and files**

See Below

**Other relevant information.**

Seychelles has various marine biodiversity and fishery management measures of long-standing. These include:

- The entirety of Seychelles EEZ falls within the Indian Ocean Whale Sanctuary. All marine mammals are protected by law since 1979 (Fisheries Act: GoS 1987 & GoS 2014).

- All species of marine turtle have received full protection under Seychelles law since 1994 – Wild Animals (Turtles) Protection Regulations (GoS 1994).
- The Whale shark (*Rhincodon typus*) has received full protection throughout Seychelles since 2003. Wild Animals (Whale Shark) Protection Regulations (GoS 2003).
- Demersal trawling is illegal throughout Seychelles waters as a measure to protect coral reefs and other benthic habitats (Fisheries Act: GoS 1987 & GoS 2014).
- Spear guns are illegal in Seychelles (Fisheries Act: GoS 1987 & GoS 2014).
- There are various regulations pertaining to the use of nets, their type and location of use to mitigate against unsustainable practices (Fisheries Act: GoS 1987 & GoS 2014).
- A minimum mesh size for fish traps is regulated (Fisheries Act: GoS 1987 & GoS 2014).
- Lobster and sea cucumber fisheries are licensed and subject to various restrictions. Various other species of crustacea are regulated including minimum size provisions. (Fisheries Act: GoS 1987 & GoS 2014).
- Distinct zones for Artisanal and Industrial fisheries are designated and distinct (Fisheries Act: GoS 1987 & GoS 2014).

Significant progress has been made in recent years with regard to fisheries and broader marine policies and legislation. Of particular note:

- The 2014 Fisheries Act sets out the framework to enable and support the regulation and implementation of fishery co-management regimes.
- The Mahé plateau demersal fishery plan was developed 2014-2015 and approved by the Cabinet of Ministers in October 2017. The plan seeks to put in place the framework for co-management of the Artisanal fishery. It establishes bag limits for leisure and sports fishers, limits the numbers of traps per boat and sets out minimum size provisions for two key commercial species the Emperor red snapper (*Lutjanus sebae*) and the Green jobfish (*Aprion virescens*). It also undertakes to research the mean size of maturity for those two species and several others with a view to establishing informed minimum size catches related to species LM<sub>50</sub><sup>2</sup>.
- The ongoing development of the Marine Spatial Plan for Seychelles (see **Section II 1.4** and ABT 11)
- The development and publication of the Blue Economy Roadmap for Seychelles, which seeks to optimise the sustainable use of Seychelles marine resources.
- The development of highly innovative new financing mechanisms. Namely the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) and the Blue Bonds funding mechanism (See **Section II 1.9**). SeyCCAT is funded by a debt for nature swap supported by The Nature Conservancy. SeyCCAT was established by law in 2015 (Conservation and Climate Adaptation Trust of Seychelles Act) and is now fully operational providing funding to support marine research, conservation and sustainable use, and management initiatives. The Blue Bonds initiative is still under development but is expected to commence providing revenue to support the implementation of the Demersal Fishery Plan and other marine sustainable use initiatives in 2019.

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<sup>2</sup> Critics of the plan note that it currently only substantively addresses two species and that the minimum sizes are below that of mean size at maturity and hence inadequate. They also note that whilst espousing an ecosystem approach to fisheries the plan lacks any substantive measures in that regard. It does not address keystone species, apex or secondary predators, neither does it seek to address ecosystem knock-on effects of targeted fisheries on certain species.



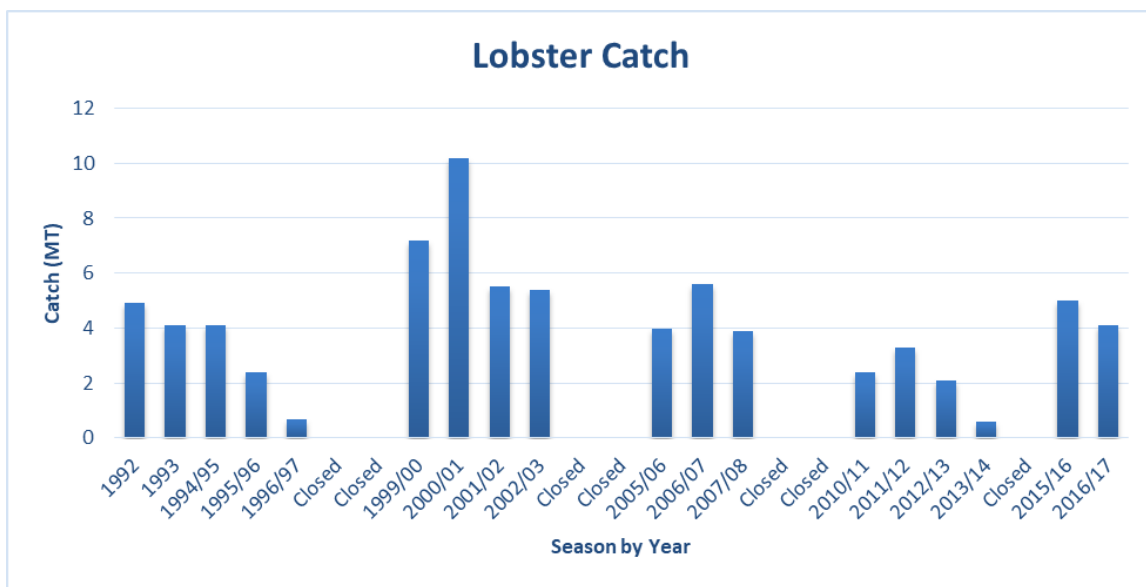
The limitation of the majority of these policy and legislation initiatives is that they have yet to be actively applied. Rather these initiatives have laid a platform from which it is hoped and expected that significant progress will be made in the advancement of Aichi Biodiversity Target 6 in the period 2019 – 2020. Furthermore the establishment of these policies and legislations creates leverage for securing necessary resources for their implementation.

### **Fishery management.**

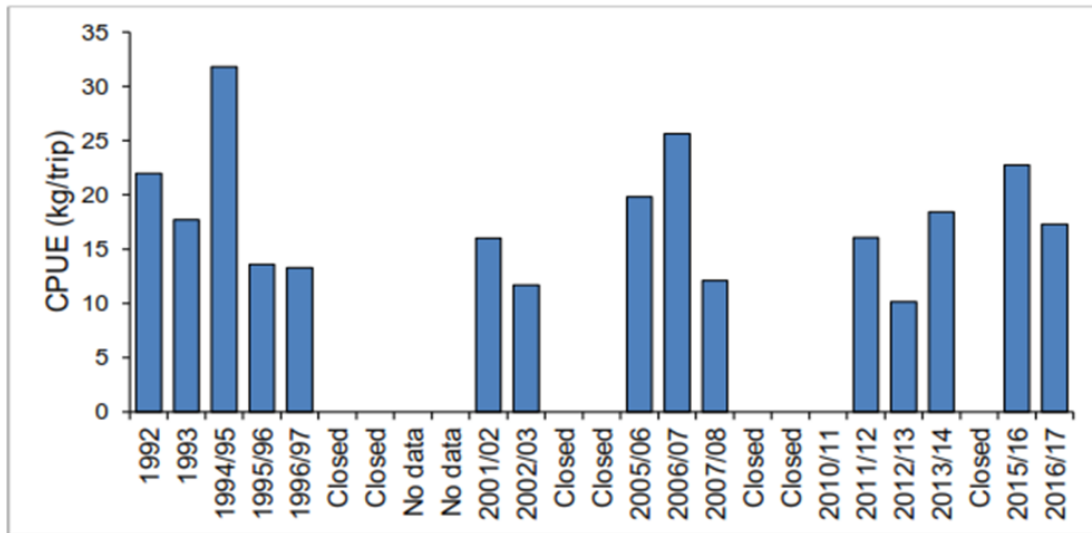
Active management measures of relatively long-standing continue to be applied to the commodity fisheries of lobster and sea cucumber.

The lobster fishery is managed on a boom and bust basis with catch, weight and mean size by species, monitored annually and the number of licences provided for a limited open season tailored accordingly, coupled with periodic annual closures. The fishery is made up of 4 species of Panulirid: *Panulirus penicillatus*, *P. longipes*, *P. versicolor* and *P. ornatus*. It appears to be a successful means of maintaining a periodic viable harvest and this is supported by both catch and CPUE data (see Figs 2 & 3 respectively).

**Figure 2. Lobster catch by season in metric tonnes** (generated from SFA lobster catch database).

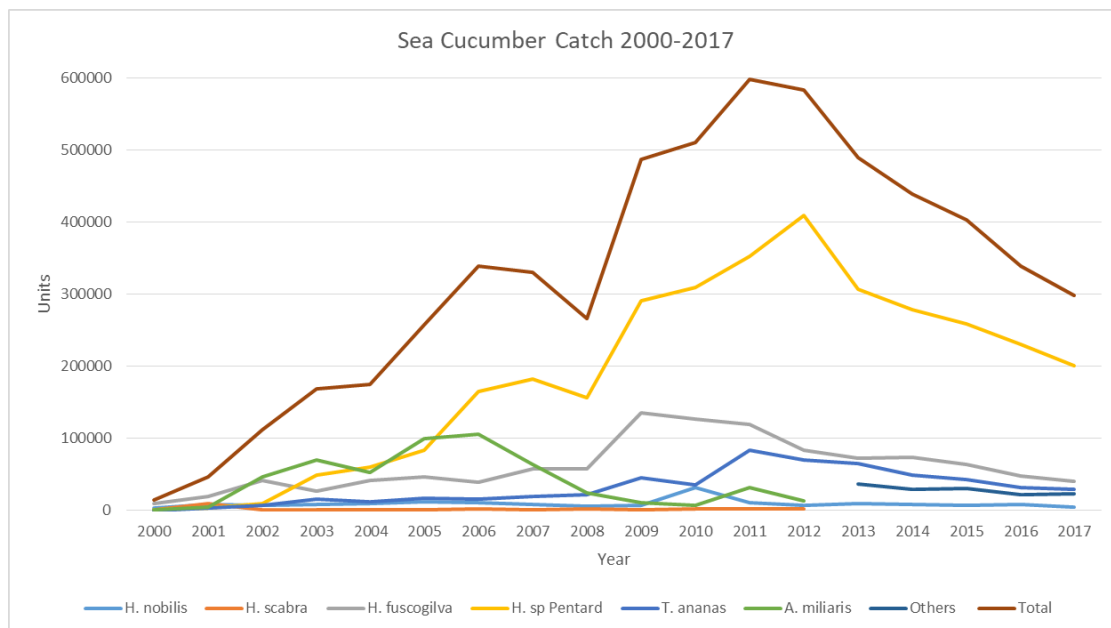


**Figure 3. Lobster Catch per Unit Effort by season in Kg/trip** (SFA 2017)



The Sea Cucumber Fishery. Data indicates that the sea cucumber resource has been chronically overfished. This was reported upon, in depth, in the fifth national report and data since that time indicate a peaking and subsequent decline in catch (See **fig 4**).

**Figure 4. Sea Cucumber Catch 2000-2017** (SFA Catch Data 2000-2017)

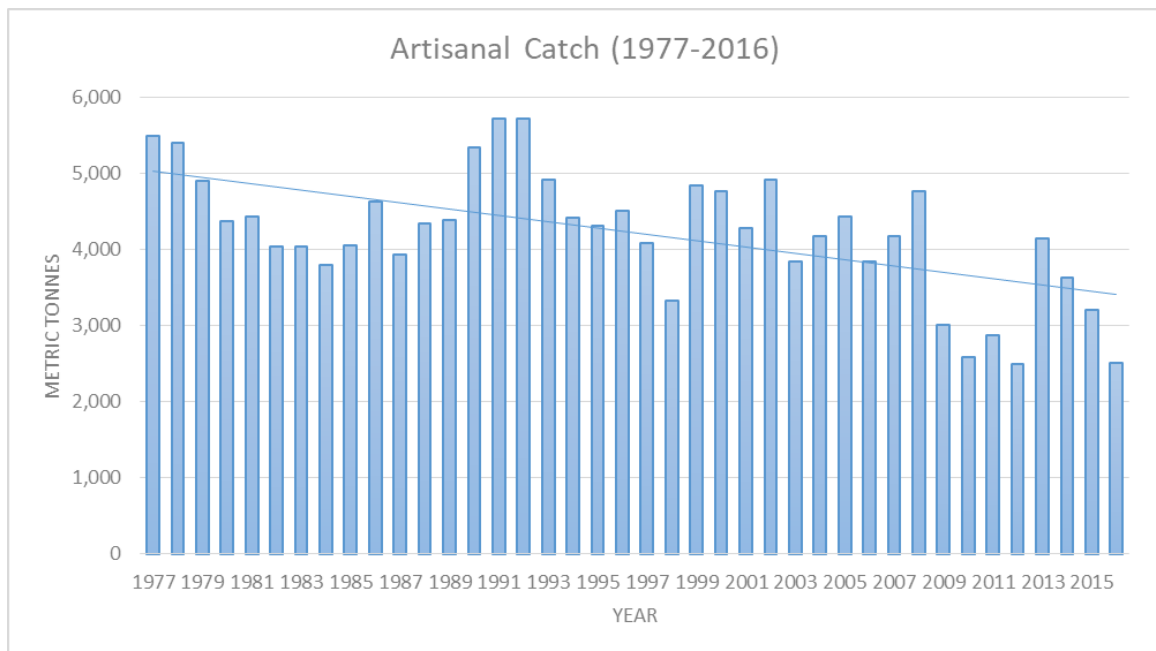


New management measures have been introduced in 2018, however, to try and put the fishery on a sustainable footing. This includes a reduction in season from 9 to 8 months and an imposition of a Total Allowable Catch (TAC). Furthermore only 3 species will be allowed to be exploited. The TAC will be set at

375,000 units divided between 3 species as follows: *H. sp Pentard* 281,500 units, *H. fuscogilva* 56,250 and *T. ananas* 37,500 units. The Seychelles Fishing Authority will monitor the catch and the TAC will be reviewed after 3 years.

Artisanal fishery catch monitoring indicates an ongoing decline in catch. The Artisanal catch peaked in 1991 and has showed steady decline since then despite equipment and technology (and hence actual effort) in the fishery improving significantly during that same period. The declining catch may in fact go back to the mid-1970s as the peak in 1990 and 91 correlated with the initiation of a new monitoring regime, prior to that catches had declined from 1977 to 1989.

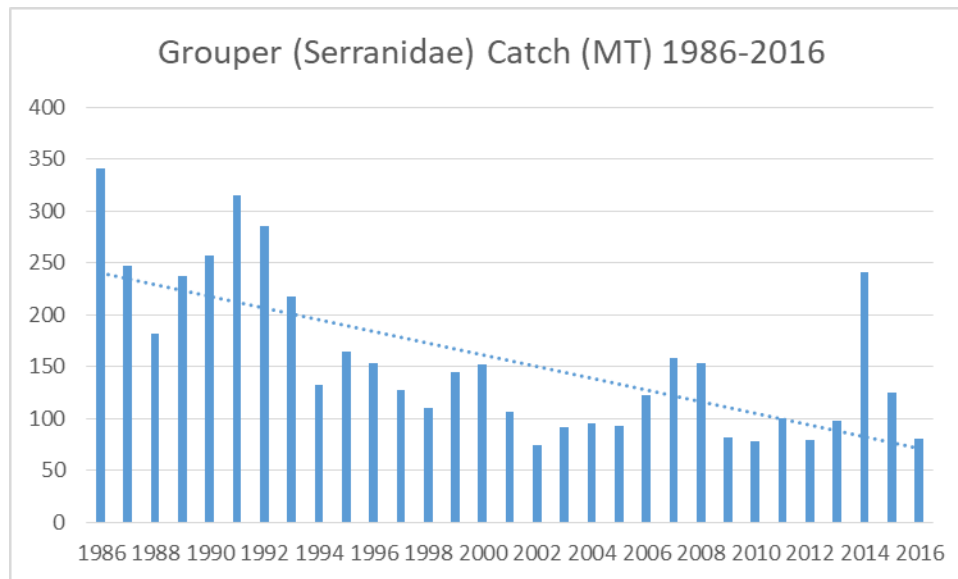
**Figure 5. Artisanal Catch 1977-2016**



(Compiled from Nevill 2016b and SFA catch statistics)

National catch data is somewhat limited in terms of resolution, in general data is recorded on a family or genus basis. However even in these cases key trends of decline are evident.

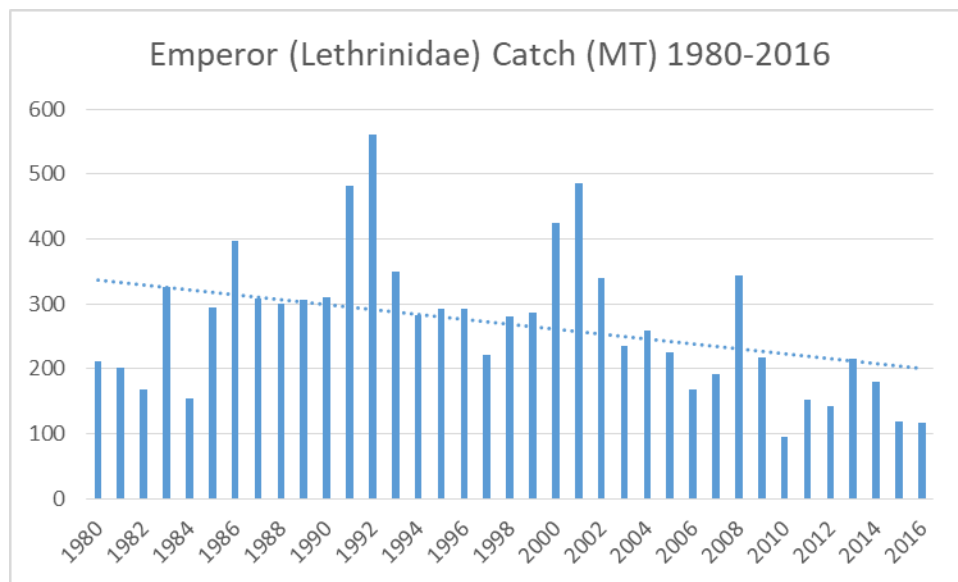
**Figure 6. Serranid Catch 1986-2016**



(Compiled from SFA catch statistics)

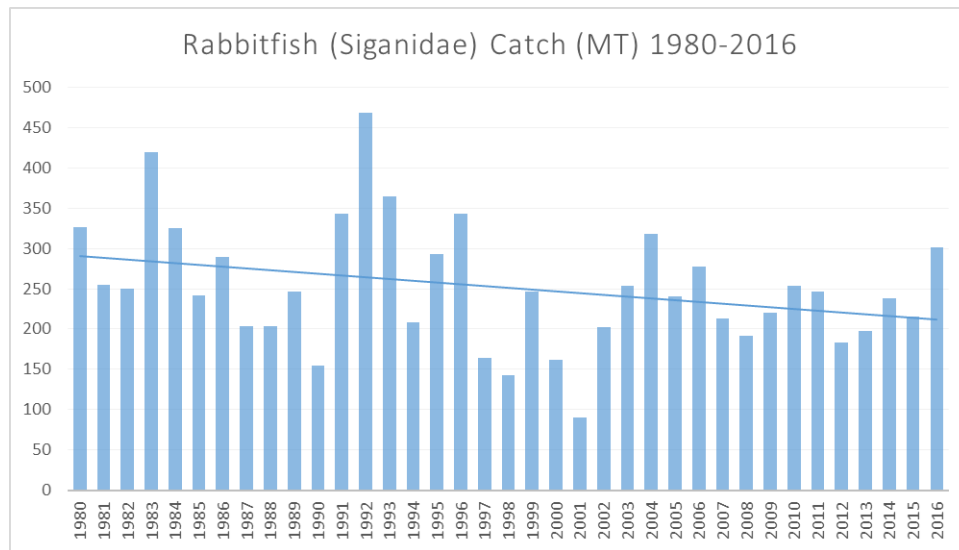
Serranids are particularly prone to overfishing due to their lifecycle and spawning aggregation characteristics. The spike in catch for 2014 reflects a targeting of demersal groupers in the outer islands by the semi-industrial long-line fleet, a practice that is recognised as unsustainable and subsequently stopped.

**Figure 7. Lethrinid Catch 1980-2016**



(Compiled from SFA catch statistics)

The Lethrinid catch fluctuates considerably but nevertheless the longstanding trend is clearly downwards.

**Figure 8. Siganid Catch 1980-2016**

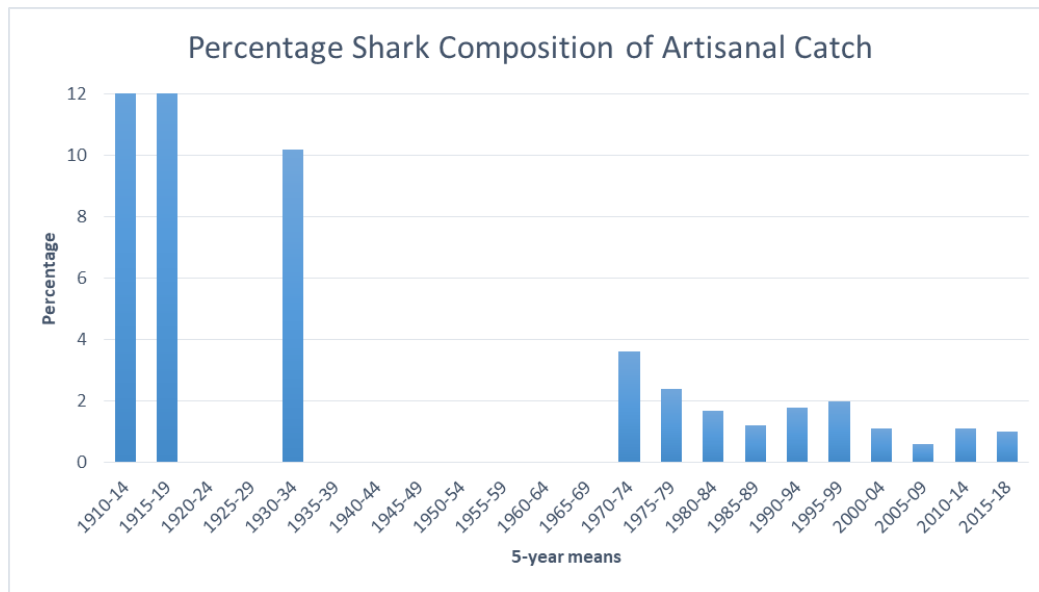
(Compiled from SFA catch statistics)

The Siganid catch constitutes an important economic component of the artisanal catch contributed by the trap fishery. Though there is a slight downward trend catches appear relatively stable <sup>3</sup> and trials are being undertaken to manage the catch by limiting effort and the targeting of SPAGs in the Praslin fishery management area.

Recent research, 2014 onwards, by NGOs and private agencies has investigated species breakdown of catch and in particular the impact of the Artisanal fishery on species prone to overfishing and threatened species (IUCN red list criteria). This work has highlighted an ongoing decline in vulnerable species such as elasmobranchs and serranids. The work on threatened species has been undertaken in partnership with fishers. The findings of a two-year intensive survey of the Artisanal catch were presented to fishers in 2018 and resulted in fishers proposing measures to reduce impact upon 13 of 25 threatened species recorded in the Artisanal catch. These measures have been forwarded to the fisheries authorities for their consideration and proposed regulation.

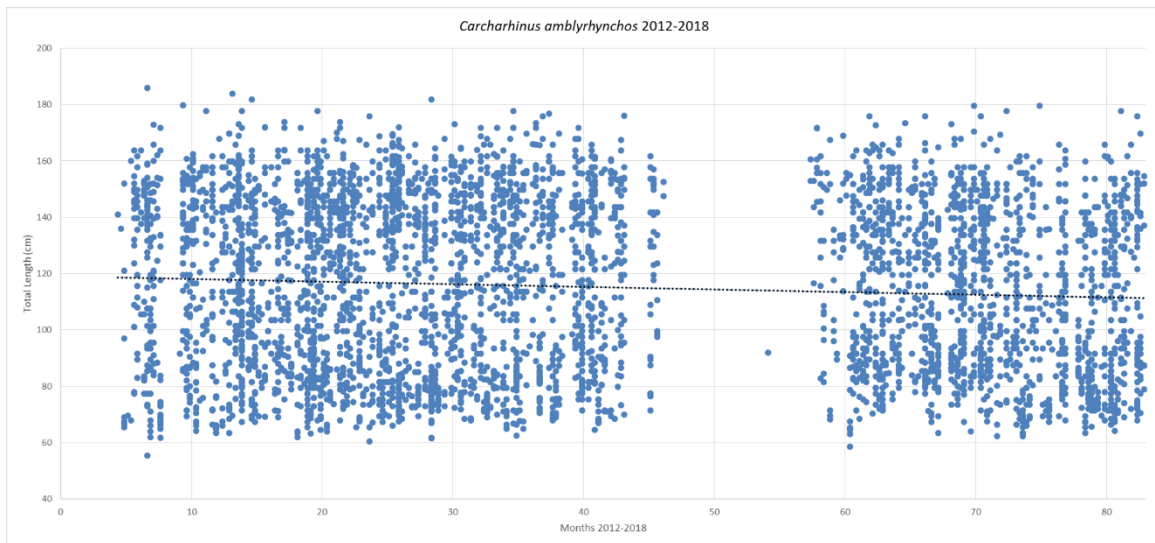
Elasmobranchs, like serranids, are prone to over fishing due to their lifecycle characteristics, in this case late maturation and low fecundity. The proportion of elasmobranchs as a component of the artisanal catch has declined precipitously over the last 100 years – Highlighting the urgent need for targeted management measures to maintain and where appropriate help stocks to recover.

<sup>3</sup> It is known from historical records that former spawning aggregation sites for Rabbitfish off the east coast of Mahe have been lost.

**Figure 9. Percentage Shark Composition by Weight of the Artisanal Catch (Nevill 2018)**

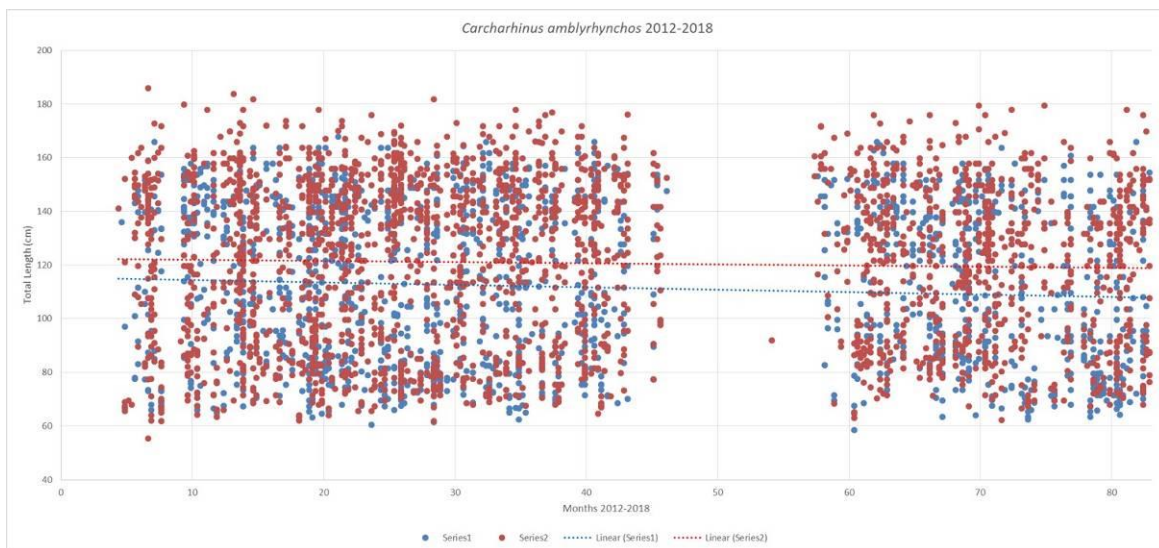
The Grey reef shark (*Carcharhinus amblyrhynchos*) is the species that accounts for the greatest tonnage of shark landed in the artisanal fishery. There is ample anecdotal evidence of decline in this species over the last 40 years most notably the demise of a previously famous aggregation site off Marianne Island where 70-80 sharks were commonly seen in the 1980s. A study spanning 6 years (with a break of 15 months) also now provides data and elucidates trends in the artisanal catch of this species. The graph below shows there is a downward trend in the mean size of specimens caught indicating ongoing over fishing of the species.

**Figure 10. *C. amblyrhynchos* Catch demographics 2012-2018 (Nevill 2018)**



This decline is apparent for both genders (see below) but notable is the decline of large females (red) in the catch.

**Figure 11. *C. amblyrhynchos* Catch demographics by Gender 2012-2018 (Nevill 2018)**



Seychelles has developed successive National Plans of Action for the Conservation and Management of Sharks (2007-2011 and 2016-2020) but the implementation of the first was limited and the second at time of reporting has yet to be launched.

It is clear therefore, that significant policy planning and legislative measures have been developed to support the implementation of Aichi Biodiversity Target 6. In general however, many of these have yet to be implemented. In the meantime catch data indicates ongoing downward trend and overfishing of the artisanal resource base. Hence the selection of no significant change in terms of progress in this report.

Industrial Fisheries. The primary industrial fisheries are managed by the provisions of the regional fishery organisation: the Indian Ocean Tuna Commission (IOTC). The IOTC was established in 1993 under the

auspices of Article XIV of the FAO Constitution and entered into force in 1996. The IOTC directly addresses aspects of UNCLOS **Article 118** (*Cooperation of States in the conservation and management of living resources*) with its objective being:

*“To promote cooperation among the Contracting Parties (Members) and Cooperating Non-Contracting Parties of the IOTC with a view to ensuring, through appropriate management, the conservation and optimum utilisation of stocks covered by the organisation’s establishing Agreement and encouraging sustainable development of fisheries based on such stocks.”*

While the IOTC’s mandate is explicitly limited to 16 species of tuna and tuna-like fish, it also states the intent to collate data on non-target species affected by tuna fishing operations<sup>4</sup>.

Analysis of IOTC’s annual reports, however, shows that current management measures are not having the full desired effect in terms of broad sustainable management of tuna and tuna-like species fisheries (see **Table 2**). Of the 15 species listed<sup>5</sup>: 5 species are overfished and subject to ongoing overfishing, 2 species are subject to overfishing, 5 species are considered to be in good status and 3 species have not been assessed. Furthermore over the last 5 years the status of 5 stocks has worsened whilst only one has improved.

**Table 2. IOTC Species Stock Status 2017** (Compiled from IOTC 2018)

Species	Year						Notes
	12	13	14	15	16	17	
Albacore <i>Thunnus alalunga</i>							Uncertainty remains due to lack of biological data. Catch should be capped to MSY level (38,800t).
Bigeye tuna <i>T. obesus</i>							Improved data collection is required to reduce uncertainty.
Skipjack tuna <i>Katsuwomis pelamis</i>							
Yellowfin tuna <i>T. albacares</i>							Status driven by unsustainable catches over last 5 years. Recovery plan with catch limitations based on 2014/15 levels.
Swordfish <i>Xiphias gladius</i>							Uncertainty of catch data means it may be being overfished. Catch should not be increased beyond MSY (31,590t)

<sup>4</sup> IOTC therefore does not address UNCLOS Article 118 in so far as it pertains to sharks.

<sup>5</sup> The Critically Endangered Southern bluefin tuna (*Thunnus maccoyii*) is not listed here as this species has been passed to the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) for management.



Black Marlin <i>Makaira indica</i>							Catches considerably higher than MSY and stock overfished. Urgent need for more than 40% catch reduction.
Blue Marlin <i>M. nigricans</i>							Catch over last 5 years significantly higher than MSY. 25% reduction from current catch stock projected to recover by 2025.
Striped marlin <i>Tetrapturus audax</i>							Commission should consider substantial reduction in catches, next stock assessment scheduled for 2018.
Indo-Pacific Sailfish <i>Istiophorus platypterus</i>							Catches should be reduced below 25,000t MSY.
Bullet tuna <i>Auxis rochei</i>							In absence of stock assessment catches should not exceed the average between 2009 and 2011 (8,870 t).
Frigate tuna <i>A. thazard</i>							In absence of stock assessment catches should not exceed the average between 2009 and 2011 (94,921 t)
Kawakawa <i>Euthynnus affinis</i>							Stock classified as not overfished or subject to overfishing, but high probability stocks below MSY levels. Reduce catches by 20% to recover to MSY levels by 2023.
Longtail tuna <i>T. tonggol</i>							Cap catches at 2015 levels (i.e. 136,849 t), for 50% probability stock will recover above MSY reference points by 2025.
Indo-pacific king mackerel <i>Scomberomorus guttatus</i>							In absence of stock assessment catches should not exceed the average catches between 2009 and 2011 (46,787 t).
Narrow-barred Spanish mackerel <i>S. commerson</i>							50% probability stock will recover to levels above the MSY reference points by 2025, if catch reduced to 30% below 2015 level.
Colour Key	Stock overfished				Stock not overfished		
Stock subject to overfishing							
Stock not subject to overfishing							
Not Assessed/Uncertain							

The shortcomings of the IOTC are however even more evident with regard to the issue of by-catch.

Although sharks are not part of the 16 species directly under the IOTC mandate, sharks are frequently caught in association with fisheries targeting IOTC species. Some fleets are known to actively target both

sharks and IOTC species simultaneously. As such, IOTC Contracting Parties and Cooperating Non-Contracting Parties are required to report information at the same level of detail as for the 16 IOTC species.

Perusal of IOTC data and reports makes it clear that work in regard to by-catch is lacking in useful substance or progress with the status of stocks of the seven main species of shark by-catch, six are classified as “Not Assessed/Uncertain” and data available on catch is very poor and clearly not in compliance with requirements.

**Table 3. IOTC Determined Shark By-Catch Stock Status 2017** (IOTC 2018a)

Species		IUCN/CITES Status	2018 Stock Status
Common Name	Scientific name		
Blue shark	<i>Prionace glauca</i>	Near Threatened (NT)	72.6% Not overfished (MSY: 33,000 t)
Oceanic whitetip	<i>Carcharhinus longimanus</i>	Vulnerable (VU) CITES App II	Not Assessed/Uncertain (Retention prohibited)
Scalloped hammerhead	<i>Sphyrna lewini</i>	Endangered (EN) CITES App II	Not Assessed/Uncertain (MSY: Unknown)
Shortfin Mako	<i>Isurus oxyrinchus</i>	Vulnerable (VU)	Not Assessed/Uncertain (MSY: Unknown)
Silky shark	<i>Carcharhinus falciformis</i>	Near Threatened (NT)	Not Assessed/Uncertain (MSY: Unknown)
Bigeye thresher	<i>Alopias superciliosus</i>	Vulnerable (VU)	Not Assessed/Uncertain (Retention prohibited)
Pelagic thresher	<i>Alopias pelagicus</i>	Vulnerable (VU)	Not Assessed/Uncertain (Retention prohibited)

Seychelles, is of course only one member state of the IOTC, but it is clear that more needs to be done in this regard and that indeed a substantive effort has not yet been applied to dealing with by-catch issues of the industrial fisheries.

### **Coral Reefs**

Climate change driven coral bleaching has caused enormous damage to coral reefs and live coral cover in the Seychelles since 1997 (**see Section VII Table 15**). The ENSO-related coral bleaching event in 1998 had a major impact on Seychelles' reefs. The reefs of the central archipelago were particularly badly affected with some 90% coral cover mortality. Fast growing *Acroporas* and *Pocilloporas* suffered most and a phase shift from live coral cover to coral rubble/macroalgae dominated-reefs was initiated. The outer islands were in general less badly affected with coral mortality more in the region of 40-50% and it has been postulated that this may reflect greater resilience due to reduced anthropogenic stress and an existing natural adaptation to greater temperature fluctuations.

Reef fish diversity showed a lag effect following the bleaching event with some impact noted on certain live-coral dependent species but in general diversity was maintained. However as time progressed recruitment of new individuals to fish populations appears to be reduced possibly related to the progressive break down of reef structure.

In the twenty years following the bleaching event natural recovery has been slow. Various factors are believed to have contributed to this:

- The loss of live coral was so extensive and widespread that sources of coral larval influx for recruitment are greatly reduced.
- The spread of algae coverage is limiting to coral recruitment and development.
- There have been further bleaching events in 2002, 2003, 2010 and 2016 that have accounted for much of the natural recovery.

Recognising that enhanced reef ecosystem resilience is vital to fend off the impacts of stresses Seychelles has embarked on a series of measures that have the objective of greatly improving management of the demersal fishery and designating 30% of the EEZ as protected areas, half of which or 15% of the EEZ to be strict no take zones, under the MSP programme (**See 1.4 Below**).

General climate trends suggest that raised sea-temperature events will occur with increasing regularity in the future and as such temperature induced coral bleaching remains the primary threat to coral reefs and their wider recovery in the Seychelles. Several coral gardens projects have been initiated by civil society initiatives, with the objective of identifying and propagating bleaching resistant coral varieties.

On a national basis there is little Seychelles can do to influence the course of global climate change, it can however seek to limit future and mitigate existing local anthropogenic impacts on coral reefs and associated shallow marine habitats.

In addition to climate change, in the context of coral reefs, overfishing has been identified as the (**GoS 2011, 2014a. Nevil *et al* 2015**) main threat to biodiversity and driver of its degradation in Seychelles (see above) direct physical damage to shallow marine habitats, however, is also an issue.

### Physical Damage/Reclamation/Siltation

#### a) Physical Damage

Historically in Seychelles, coral reefs and reef flats were extensively mined for construction, both for building blocks and the production of lime for cement, this is no longer the case but these habitats are still exposed to extensive physical damage. Coral is blasted to create channels, reef flats are excavated to create swimming areas, safe moorings and ports. Though illegal, sand mining is still considered a problem in some locations affecting natural seasonal beach dynamics. Many lagoon and tidal mudflat areas are periodically dredged to facilitate navigation or drainage. Further offshore extensive licensed sand mining has been undertaken to provide sand for construction with consequent impact on the benthos.

Finally there is the long term concern of damage to coral from boat and fishing activities. Anchor damage has long been an issue (**Engelhardt 2004**) in popular mooring and dive spots, however the direct correlation between structural complexity and reef resilience to climate change (**Graham et al 2015**) makes it ever more so important now. Bottom trawling is illegal on the Mahé plateau (**GoS 2014, GoS 1986**) due to the damage that it would cause, illegal net use is evident however in the fishery catch, in particular the dragging of small weighted nets over coral reefs.

New fishing techniques may also be of concern. There is no information to suggest that poison or explosives are utilised in Seychelles, but on the 7th November 2016 the Leader of the Opposition raised concerns in the National Assembly about the use of barrels filled with bait being suspended in the water to attract fish which when moving in the swell cause significant coral damage, this method being utilised by foreign (IUU) vessels and allegedly increasingly adopted by local fishers.

#### b) Reclamation/Siltation

In recent decades<sup>6</sup> there have been extensive reclamation activities along the east coast of Mahé<sup>7</sup>. Phase I (1985) of the east coast reclamation caused considerable damage through siltation on the reefs along the east coast. Operations in Phase II were modified to reduce siltation in adjacent waters with extensive use of filter cloth and rock armoured bunds constructed to form basins which were then filled in. Phase III took place under the auspices of a Class I Environmental Impact Assessment following the coming into force of the EIA Regulations in 1996. The EIA undertaken and lead entirely by local practitioners however seemed to focus on attempting to minimise the impact upon the adjacent St Anne marine park rather than considering the value of the actual area to be reclaimed. Phase III required over 15 million cubic metres of coral fill to be extracted from channel between Mahé and the marine park to reclaim 343.5 ha of land with a consequent large impact on the benthos (see **Map 1** overleaf for the 3 phases of reclamation). The EIA appears not to have recognised that nearshore coral reefs are very different, with far more complex ecological roles, to the reefs found elsewhere throughout the Mahé Plateau and beyond. There is very strong anecdotal evidence that the reclamation saw the collapse of the economically important White-streaked grouper (*Epinephelus ongus*) fishery, due to its main spawning ground being covered by the reclamation (see **Info Box I**). Likewise

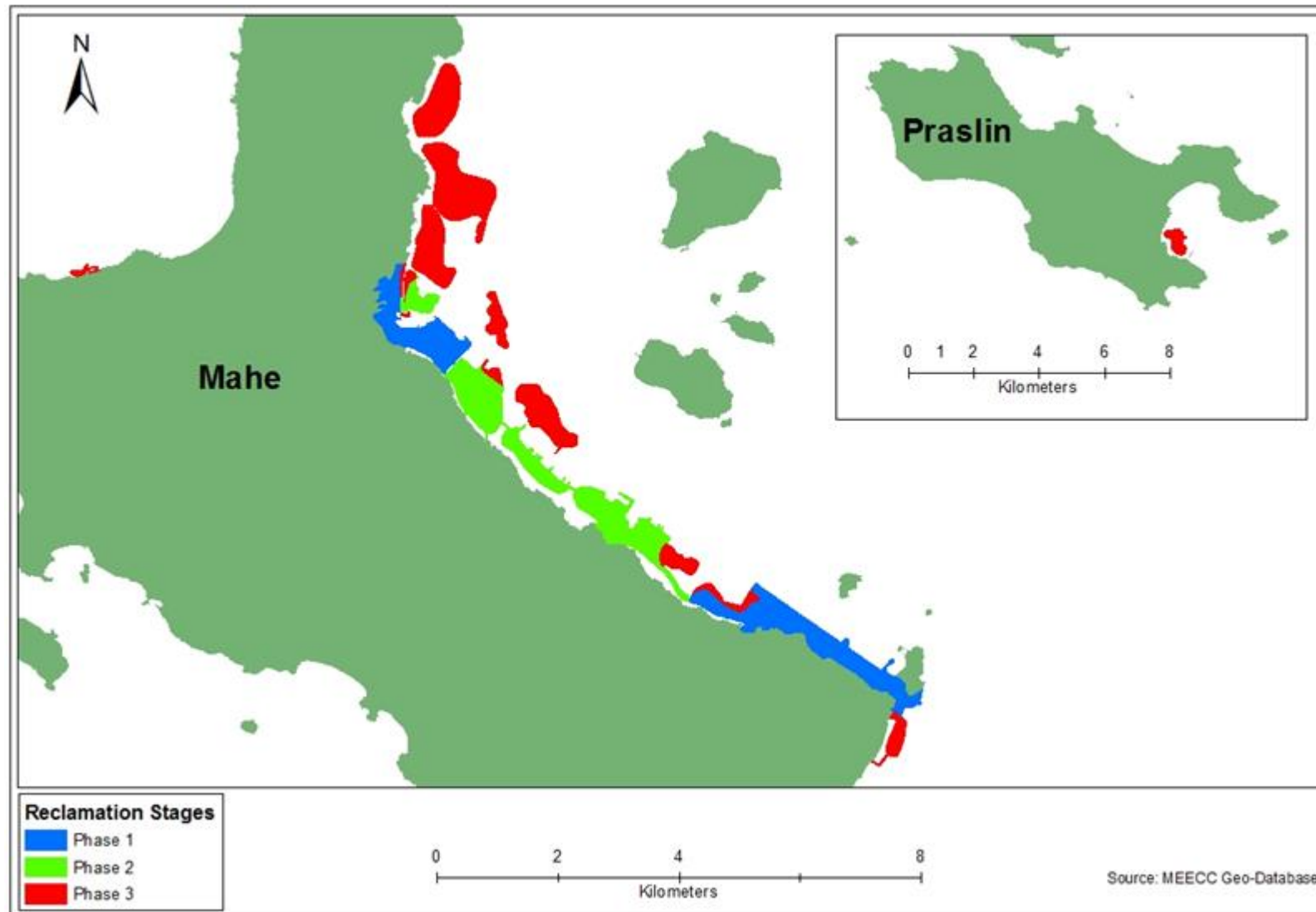
<sup>6</sup> In the late 1960s land for the International airport at Point Larue was reclaimed. Then there were three phases of the east coast reclamation project 1985, 1991, 2001-2003. This has been followed by various further smaller scale reclamations for ports, roads and additional land e.g. Ile Soleil.

<sup>7</sup> There have also been significant reclamation and excavation related to land reclamation and port construction at Baie St Anne (Praslin) Bel Ombre (Mahé), La Digue, Fregate and Silhouette, St Anne and Anonyme islands.

catch of the Marbled parrotfish (*Leptoscarus vaigiensis*) collapsed after the reclamation (**see Info Box II**) apparently due to loss of its favoured seagrass beds.

Siltation also comes from terrestrial sources and this needs to be better addressed as it is a common occurrence after rains to see coastal lagoons and bays turned red by the earth washed into the sea from construction areas on the hillsides.

**Map 1. The 3 Phases of Reclamation in Central Seychelles (MEECC Geo-Database)**



### Information Box I: East Coast Reclamation Impact on Fisheries

The White-streaked grouper (*Epinephelus ongus*) is known locally as Vyey Avril because it formally constituted an important seasonal fishery off the east coast of Mahé. Each April the grouper would gather in huge numbers on the reefs along North east coast of Mahé to spawn. Boats could be seen lining up along the coast to catch the fish that teemed in the shallow waters. A particular technique was used to handle the fish which was known to go off quickly. The boats would partially flood themselves so that hooked fish could be released into sea water in the bottom of the boat and kept alive until landing thereby ensuring their good quality on arrival at market. Interviews in the recent preparation and early stages of a fishery threatened species project (GIF 2016) indicate that fishers believe this fishery collapsed as a direct consequence of the spawning grounds being damaged by the east coast reclamation. An economically important, local, seasonal fishery in the 1980s the population has collapsed such that an intensive survey of the artisanal fishery throughout 2014 recorded only 4 specimens for sale at the Victoria market.



Photo 1: The White-streaked Grouper (*Epinephelus ongus*) recent fisher interviews indicate its fishery was lost due to reclamation of and related damage to this species' spawning site. Photo © 2016 J. Nevill.

The Marbled parrotfish (*Leptoscarus vaigiensis*) known as “Marar” in Creole was, according to Fisher interviews, a common and relatively abundant component of the artisanal catch brought to sale at Victoria market from catches off the north east coast of Mahé. Marar is today a rare sight for sale at the central market, though still more commonly landed in southern and western Mahé, and fishers attribute this to the loss of seagrass beds, which it utilises as habitat and food (Sommer *et al* 1996), to dredging and land reclamation.



Photo 2: The Marbled parrotfish fishery is also believed to have suffered significant decline as a direct result of the east coast reclamation. Photo © 2016 J. Nevill.

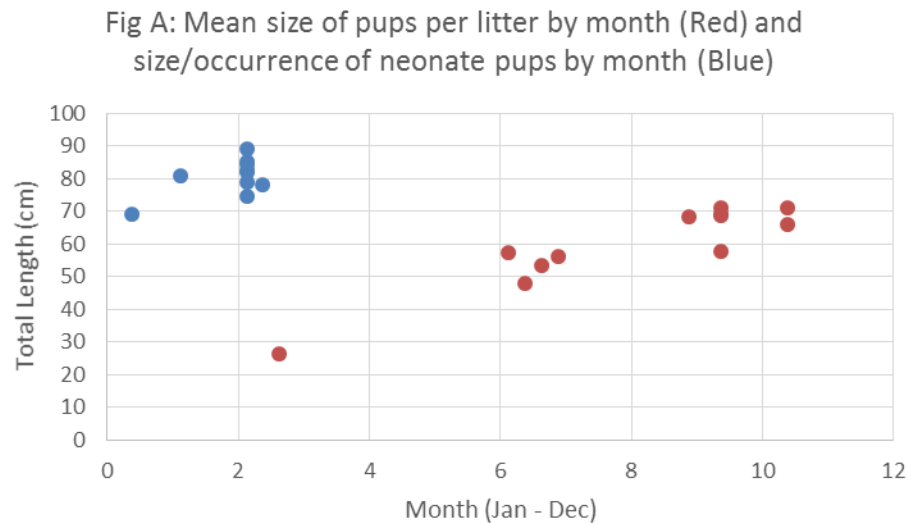
Many species of teleost utilise coastal shallow water habitats as nursery grounds. This is true also for many species of shark in Seychelles. The endangered (IUCN Red List) Scalloped hammerheads (*Sphyrna lewini*) are known to spend the first 24 months of their life in the coastal waters of the main granitic islands (Nevill 2016c) and it has recently been shown that the females are philopatric (Nevill 2016c) making this habitat critical for maintenance of the population. Likewise the endangered Great hammerhead (*Sphyrna mokarran*) and the near threatened Blacktip and Spottail sharks (*Carcharhinus limbatus* and *C. sorrah*) also utilise inshore waters as nursery habitat (Nevill 2016a). The same is true for the near threatened Bull shark (*C. leucas*) but due to its requirement for brackish water to reproduce, the east coast of Mahé may constitute a critical habitat not only nationally but regionally (see Info Box II) for the species (Nevill 2013).

#### Information Box II: East Coast of Mahé Critical Habitat

The inshore waters around Mahé provide important nursery habitat for various shark species but may be of critical importance for the Bull shark (*Carcharhinus leucas*) population not only nationally but possibly sub-regionally. Bull sharks utilise shallow brackish water habitats such as estuaries and lagoons as pupping grounds and nursery areas (Compagno 1984, Simpendorfer *et al* 2005, Ortega *et al* 2009). It is believed that this adaptation provides a low-mortality environment for young bull sharks (Heupel & Simpendorfer 2011). The catchment area of north Mahé (Morne Seychellois and surrounds) is the largest for nearly a 1000 miles and the bay of Port Victoria with its surrounding islands in St Anne is the only sheltered location where the run-off can generate a brackish environment for any extended duration. In temperate climes Bull sharks are known to pup in spring or early summer however in the tropics around continental coastlines there is evidence to suggest pupping all year round (Compagno 1984). Seychelles however with its small landmass and distinct rainy season (peak rainfall November-January) has limited freshwater runoff and the breeding of Bull sharks in Seychelles reflects this. Monitoring of Bull shark catch in the artisanal fishery (2012-2013) clearly shows a progression of pup size in utero and the occurrence of new-borns (i.e. free swimming pups whose umbilical scar has yet to heal) that indicate pupping in October and November – see Fig A.

<sup>g</sup> It should be noted that Robinson *et al* 2004 record that anecdotal accounts at that time indicated the fishery had collapsed before the reclamation due to over fishing.





Source J. Nevill 2013

This area on the North east coast of Mahe represents by far the largest catchment and associated sheltered bay in the country and it is logical therefore that it is utilised by Bull sharks from all over the Mahé plateau. There is no suitable pupping habitat in the Amirantes and although a Bull shark resident in the Amirantes was recently shown to have journeyed to Madagascar to pup before returning to the archipelago (Lea *et al* 2015), the Mahé plateau is very much closer and it seems probable many of the Bull sharks from the Amirantes utilise Mahé as a nursery ground. Likewise the Chagos archipelago has no suitable nursery habitat and it is conceivable that Bull sharks, from the healthy population resident there (Tickler 2014), also utilise Mahé as a nursery ground; Chagos being closer to Mahé than the subcontinent. If correct this would make the east coast of Mahé a critical (sub)regional habitat for the Bull shark. Genetic analysis of the populations is required to determine if this linkage exists.

#### Legislation to support coral reef management: The Environment Protection Act 2016

The new EPA is highly pertinent in the context of this review pertaining to “legislation and frameworks relevant for conservation of coral reefs and associated ecosystems (e.g. seagrass beds and mangroves) in the Seychelles”. In particular the EPA defines the term wetland as follows:

*“an area of mangrove, marsh, swamp or water, which are permanent or temporary [sic] submerged (with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction) under fresh, brackish or salt water that is static or flowing including areas of marine water in which at low tide, where [sic] the depth does not exceed six metres, and includes riparian and coastal zones*

*adjacent to the wetlands, and island [sic] or bodies of marine water lying within the wetlands, which have a depth of not more than six metres at low tide."*

Shortcomings in drafting aside, this provides for an exceedingly broad definition of wetlands, and a significant expansion of the definition in the 1994 EPA:

*"wetland" includes all freshwater and tidal areas that are or may be submerged or periodically submerged under fresh or salt water, including all bodies or areas commonly referred to as marshes, swamps, beaches and flats."*

The new definition means that wetlands to be considered as sensitive areas, will include extensive areas of coral reef throughout the Mahé Plateau and indeed, though not pertinent to this study, the southern banks<sup>9</sup>.

The Act also provides for other pertinent definitions, notably:

- **"water quality"** means *the characteristics of water which define its use in terms of physical, chemical and biological contents.*
- **"watercourse"** includes *any river, stream, dam, reservoir, water catchment and wetlands and any drain or channels.*

The EPA imbues the Minister for Environment with broad ranging powers very pertinent to the subject matter (See **Table 4** for listing of pertinent provisions) under review including: standards and safeguards for water quality, regulations for the protection of water including fishing and recreational areas, the declaration and regulation/protection as appropriate of the coastal zone but none more so than the definition of development for which the EPA can be applied, and thus Environmental Authorisation required. The definition is comprehensive with the extensive list of criteria concluded with the "catch all" provision of:

*"(x) any use of land, sea or building as determined by the Minister."*

Table 4: Provisions of the 2016 EPA pertinent to Coral reefs and Associated Shallow Marine Ecosystems	
Section	Text
14.	<p><u>Standards and Safeguards</u></p> <p><i>The Minister may prescribe standards and safeguards for:</i></p> <p><i>(a) quality of air water or soil for various areas and purposes;</i></p> <p><i>(b) effluent limitations for existing and new point sources;</i></p> <p><i>(g) Pesticide and other residues in the environment.</i></p>
15.	<p><u>Regulations for Protection of Water</u></p> <p><i>The Minister may by regulations provide for:</i></p>

<sup>9</sup> It should be noted however that an ongoing parallel EBA process (EBA-SSC GEF project) has formulated, for management purposes, a new definition of wetlands which goes only to the limits of low tide.

	<p><i>(a) the preservation of fishing areas, drinking water sources and reservoirs, recreational and other areas where water may need special protection; and</i></p> <p><i>(b) carrying out works which appear to be necessary to prevent, control or abate water pollution from natural causes, abandoned works, developments, projects or activities not excluding measures to remedy and restore integrity of the affected area.</i></p>
16.	<p><u>Classification, Reclassification of Water</u></p> <p><i>(1) The Minister may classify all waters in Seychelles based on their best usage.</i></p> <p><i>(2) The Minister shall, in making classification under subsection (1) have regard to section 5, and take into consideration the following factors:</i></p> <p><i>(a) the existing quality of the body of water at the time of classification;</i></p> <p><i>(b) the size, depth, surface area covered, volume, direction and rate of flow, gradient of stream of the body of water; and</i></p> <p><i>(c) the most beneficial use and value for public water supplies, propagation of fish, recreational purposes, agricultural, industrial and other legitimate uses.</i></p> <p><i>(3) Where the public interest so requires, the Minister may re-classify a body of water based on intended beneficial use and take such steps as may be necessary to upgrade the quality of such water.</i></p>
17.	<p><u>Deterioration of Water Quality and Upgrade</u></p> <p><i>Where the quality of water has deteriorated to such a degree that its state adversely affects its best usage, the Minister may, in co-ordination with other public bodies associated with water quality management, take measures as deemed necessary to upgrade the quality of such water to meet the prescribed water quality standards.</i></p>
28.	<p><u>Declaration of Coastal Zone and its Protection</u></p> <p><i>(1) The Minister may, by notice published in the gazette declare one or more Coastal Zones with subsidiary zones therein to cater for:</i></p> <p><i>(a) sensitive zones of high cultural, recreational and aesthetic value;</i></p> <p><i>(b) no development and climate based zones;</i></p> <p><i>(c) zones dedicated to the preservation and rehabilitation/conservation of coastal biodiversity; and</i></p> <p><i>(d) zones as reclaimed naturally or artificially.</i></p>
29.	<p><u>Survey of Coastal Zones and Preparation of Integrated Coastal Zone Management Plan</u></p> <p><i>(1). The Ministry may make or cause to be made a survey of the Coastal Zones and prepare or cause to be prepared an integrated Coastal Zone management plan based on the report of the survey.</i></p>

	<p><i>(2). The report of a survey made under subsection (1) shall include:</i></p> <p><i>(a) an inventory of all structures, roads and excavations, harbours, outfalls, dumping sites and other works located in the Coastal Zone;</i></p> <p><i>(b) an inventory of the state of the coral reefs, mangroves and marshes found within the Coastal Zone;</i></p> <p><i>(c) an inventory of all commercially exploitable mineral deposits, both proven and suspected, located within the Coastal Zone;</i></p> <p><i>(d) an inventory of all areas within the Coastal zone of scenic value or of value for recreation purposes.</i></p> <p><i>(e) an inventory of all estuarine or wetland areas within the Coastal Zone with an indication of their significance as fisheries or wildlife habitat;</i></p> <p><i>(f) an inventory of all areas within the Coastal Zone of special value for research regarding coastal phenomena, including fisheries and sea erosion, littoral movements and related subjects;</i></p> <p><i>(g) an estimate of the quantities of sand, coral, sea shells and other substances being removed from the Coastal Zone;</i></p> <p><i>(h) an estimate of the impact of erosion on the Coastal Zone;</i></p> <p><i>(i) an estimate of the extent, nature, causes and sources of coastal pollution and degradation;</i></p> <p><i>(j) an inventory of all users and uses of the coastal zone paying particular attention to the interactions/mixed uses of resources by stakeholders.</i></p> <p><i>(k) any other relevant data or information that may be deemed necessary.</i></p> <p><i>(3). The Ministry shall as circumstances require:</i></p> <p><i>(a) review the Integrated Coastal Zone Management Plan prepared under subsection (1);</i></p> <p><i>(b) take necessary measures to restore, rehabilitate or protect all or part of the coastal zone as recommended by the survey prepared under subsection (1).</i></p>
30.	<p><b><u>Regulations of Activities in Coastal Zone</u></b></p> <p><i>(1) The Minister may make regulations to ensure that activities in the Coastal Zone are conducted so as not to cause damage to the environment and to provide for such measures as are necessary to prevent, reduce and control pollution in the Coastal Zone.</i></p> <p><i>(2) Notwithstanding the generality of subsection (1), regulations under that subsection may provide for:</i></p> <p><i>(a) the control and prevention of pollution of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures;</i></p>

	<i>(b) such other matters relating to the preservation and conservation of the Coastal Zone.</i>
31.	<p><u>Regulations for Exploration and Exploitation</u></p> <p><i>(1) The Minister may make regulations to govern the environmental performance of petroleum and mineral exploration and exploitation activities within the territorial waters and, or the Exclusive Economic Zone of Seychelles, which shall include:</i></p> <p><i>(a) requirements for preparation of Environmental Impact Assessments;</i></p> <p><i>(b) applicable discharge quality standards and atmospheric emission standards;</i></p> <p><i>(c) environmental management planning requirements;</i></p> <p><i>(d) contingency plans for releases of oil and other polluting substances;</i></p> <p><i>(e) management measures for use and handling of polluting or hazardous substances;</i></p> <p><i>(f) requirements relating to conservation of biodiversity.</i></p>
43.	<p><u>Definition of Development</u></p> <p><i>(1) In this Act, “development”</i></p> <p><i>(b) Includes: (x) any use of land, sea or building as determined by the Minister.</i></p>
44.	<p><u>Environmental Authorisation</u></p> <p><i>1) A person shall, before carrying out:</i></p> <p><i>(a) a development as provided for under this Act;</i></p> <p><i>(b) a prescribed project or activity; or</i></p> <p><i>(c) a project or activity in a protected or ecologically sensitive area as may be prescribed under this Act or any written law, obtain an environmental authorisation from the Ministry.</i></p>

**Relevant websites, web links and files:**

IWC Indian Ocean Whale Sanctuary: <https://iwc.int/sanctuaries>

Fisheries Act 1987: <https://seylil.org/sc/legislation/consolidated-act/82>

Fisheries Act 2014: <https://seylil.org/sc/legislation/act/2014/20->

Wild Animals (Turtles) Protection Regulations: <https://seylil.org/sc/legislation/consolidated-act/247>

Conservation and Climate Adaptation Trust of Seychelles Act: <https://seylil.org/sc/legislation/act/2015/18>

SeyCCAT: <https://seyccat.org/>

MSP website: <https://seymsp.com/>

SFA website: <http://www.sfa.sc/>

Blue Economy Roadmap: <http://thecommonwealth.org/project/seychelles-blue-economy-strategic-roadmap-and-implementation>

**See also references section.**

**Obstacles and scientific and technical needs related to the measure taken:**

Key obstacles relate to the vast area of EEZ, numerous landing sites and limited institutional monitoring and enforcement capacity

**Relevant websites, web links and files**

**N/A.**

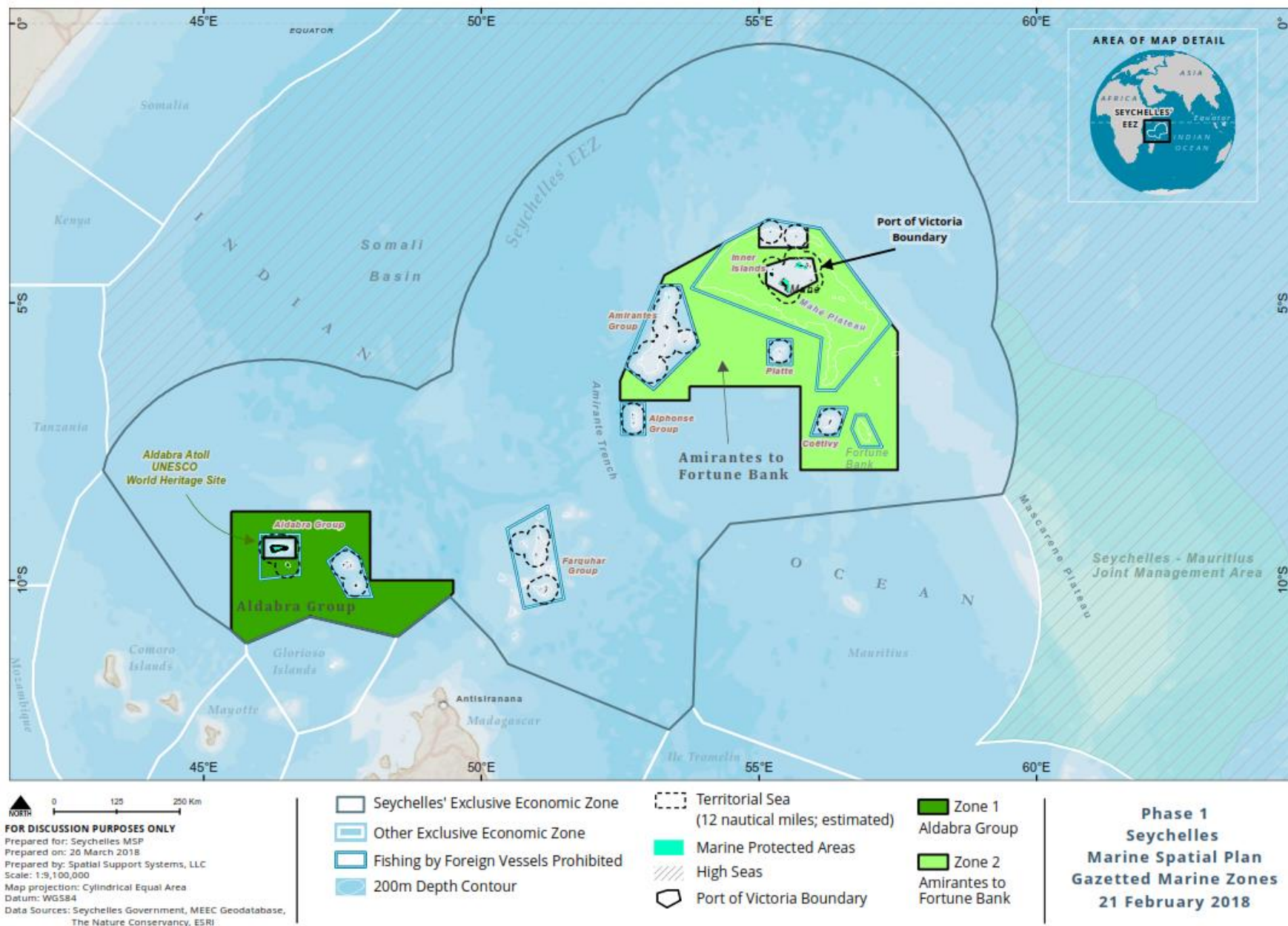
**1.4. Seychelles Marine Spatial Planning Initiative (MSP)**

In 2012 at the “Rio +20” United Nations Conference on Sustainable Development (UNCSD) the Government of Seychelles announced its intention to designate 30% of its Territorial Waters and Exclusive Economic Zone (EEZ) as protected. Half of this area, or 15% of the EEZ, to be designated as “no-take” areas. The Seychelles Marine Spatial Planning Initiative was established in 2014 to address this commitment. The process and subsequent implementation of the plan is being enabled by an innovative debt for climate adaptation and nature swap. Marine Spatial Planning is a practical, transparent and participatory way to plan for the sustainable use of the Seychelles’ marine space and to balance demands for development with the need to protect the environment. The Seychelles Marine Spatial Plan (MSP) initiative is Government led with planning and facilitation managed by The Nature Conservancy (TNC). The Initiative is being funded through various grants managed by the Government of Seychelles and TNC respectively.

Seychelles MSP initiative, is without question the largest single national activity undertaken in the current reporting cycle to address issues of the conservation and sustainable use of biodiversity. A lengthy and iterative process of stakeholder consultation was undertaken and continues. The first phase of the MSP culminated with the February 2018 protected area designation of 15% of Seychelles marine area (See **Maps 2-4** below). Phase 2 commenced in October 2018 with the target for the full 30% to be legally designated by 2020 at the conclusion of Phase 3. When completed Seychelles MSP will be the second largest MSP in the world.

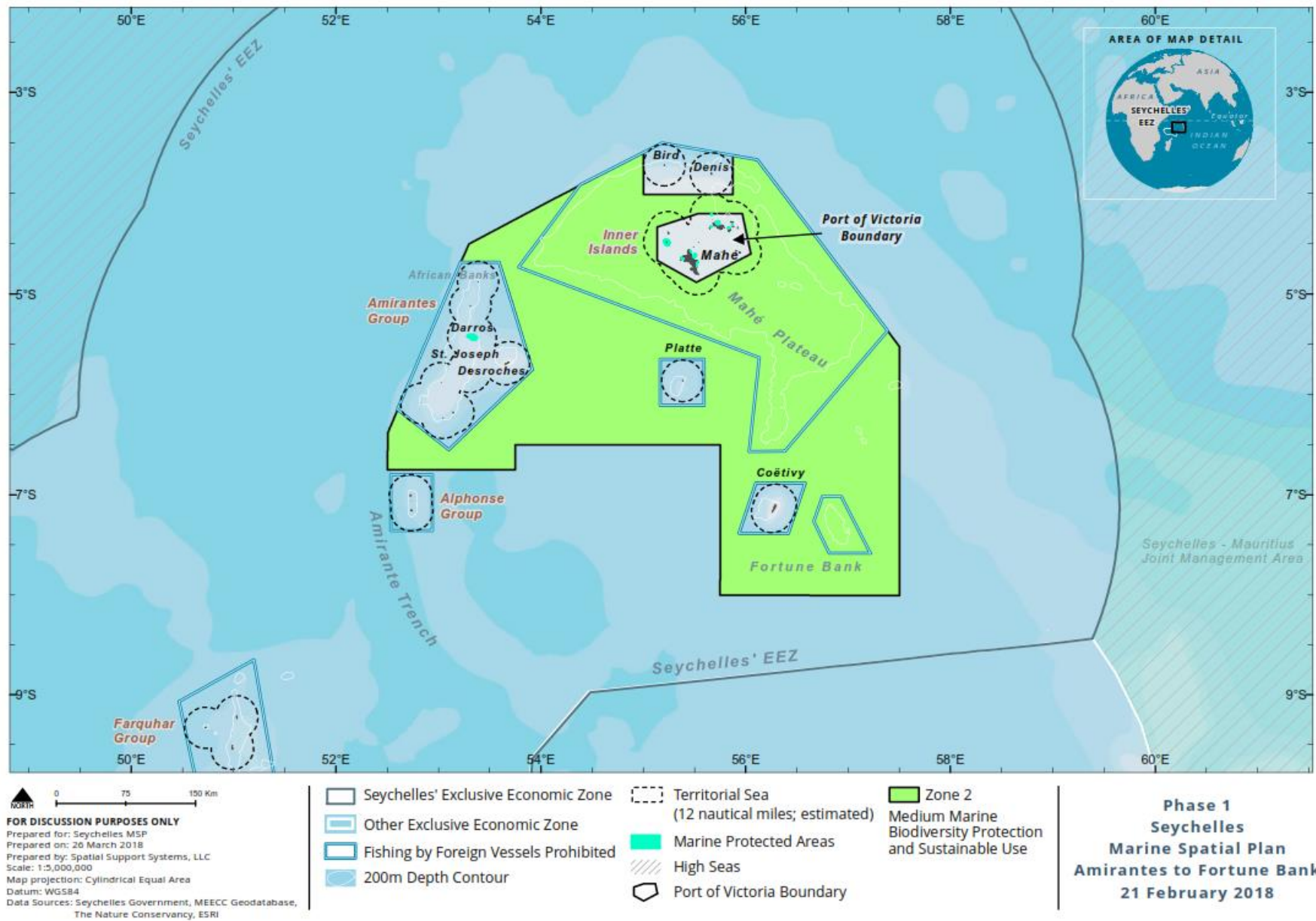
This initiative comprised various initiatives. First has been the establishment of the Seychelles Conservation and Climate Adaptation Trust fund (SeyCCAT)<sup>[1]</sup>. This was enabled by an innovative debt for conservation and climate adaptation swap<sup>[2]</sup>. This established a 20 year funding mechanism for marine research, conservation, sustainable use projects (**See ABT 20 in Section III**).

Map 2. Gazetted Marine Zones (MSP Phase I) (21/02/18).

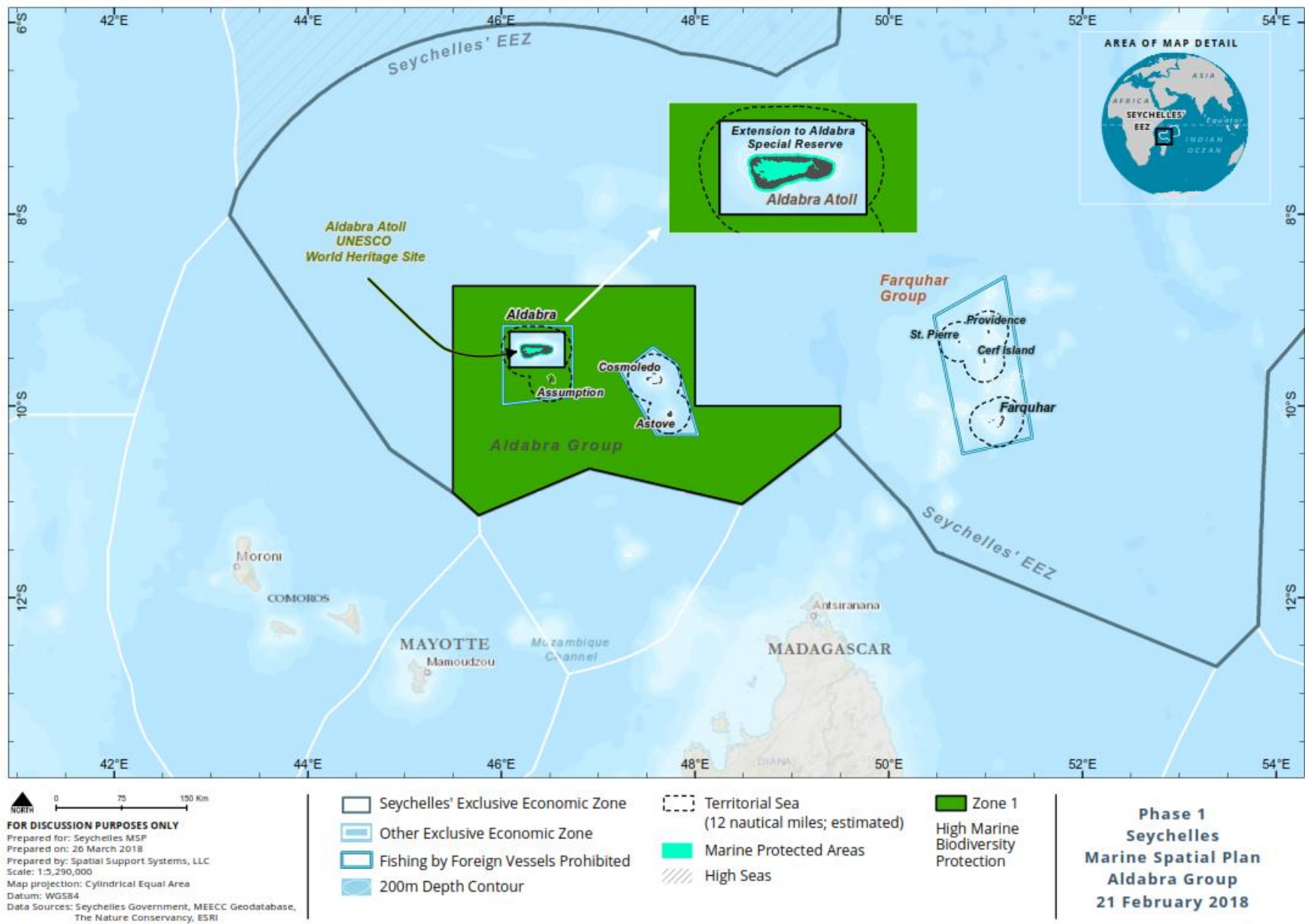




**Map 3. Gazetted Marine Zones Amirantes to Fortune Bank (MSP Phase I) (21/02/18).**



**Map 4. Gazetted Marine Zones Aldabra Group (MSP Phase I) (21/02/18).**



**For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes**

This implementation Measure in particular addresses the marine component **Aichi Biodiversity Target 11**.

It also makes significant contributions towards the national implementation of **ABTs 6, 10, 12, 15 and 15**.

**Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:**

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective
- ☐ Measure taken has been ineffective
- ☐ Unknown

**Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above**

At the time of reporting the process of Marine Protected Area identification and designation is not yet complete. It is expected to be completed in early 2020. The areas designated to date however already exceed the target and meet the criteria of Aichi Biodiversity Target 11 except for the component of effective management (See Section III. 11.1). The enormous expansion of marine Protected Areas will require an equally large growth in management capacity. This is to be addressed by the proposed Oceans Authority (**see 1.1 above**).

**Relevant websites, web links and files.**

1). The whole process is covered in detail, step-by-step, at the Seychelles Marine Spatial Plan Website.

<https://seymsp.com/>

2) Conservation and Climate Adaptation Trust of Seychelles Act

<https://seylil.org/sc/legislation/act/2015/18>

**Other relevant information**, including case studies to illustrate how the measure taken has resulted in (or is expected to result in) outcomes that contribute to the implementation of the NBSAP

See below.

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information can be found)

1) Seychelles Debt Conversion for Marine Conservation and Climate Adaptation Case Study  
<https://www.convergence.finance/knowledge/3p1S3pSTVKQYYC2ecwaeiK/view>.

**Obstacles and scientific and technical needs related to the measure taken:**

A key obstacle to the identification of an appropriate marine protected area network was the lack of processed information on biodiversity occurrence. Over 40 GIS mapping information layers were utilised and known habitat types and benthos extrapolated across unstudied areas utilising their known characteristics. With this basis the Government adopted a Systematic Conservation Planning approach to develop initial PAN options using MARXAN. The MARXAN programme identifies the most spatially efficient system of protected areas to meet conservation design targets while minimising the socioeconomic cost of protected area expansion to resource users (Klaus 2015). In this exercise 7 “cost” data layers, informed by multiple datasets, were constructed to represent environmental and user trade-offs. The programme runs many thousands of scenarios with varying degrees of the factors involved to identify best fit models to attain the specified objectives. These options were then refined through an extensive and iterative process of stakeholder consultation and approval to generate the gazetted areas.

**Relevant websites, web links and files**

1). Seychelles Marine Spatial Plan Website. <https://seymsp.com/>

**1.5. Protected Areas**

**For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes**

This measure applies directly to **ABT 11** but also supports implementation of **ABTs 6, 10, 12, 14 and 15**.

**Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:**

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective
- ☐ Measure taken has been ineffective
- ☐ Unknown

**Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above**

Protected areas have historically been central to Seychelles approach to the conservation and sustainable use of biodiversity. It has been very successful in various aspects *inter alia*:

- The protection of key ecosystem services such as soil and water cycles on the main populated islands (See **Section III ABT 14 and Section II 1.8**) and management of fisheries (see **Section III ABT 6 and Section II 1.3**).
- The protection of diverse threatened species (see **Section III ABT 12 and Section II 1.7**).
- Now pioneering a new approach to marine biodiversity management and sustainable development through the Blue Economy Road Map and Seychelles Marine Spatial Planning Initiative (See **Section II 1.4**).

Many of Seychelles original marine reserves were designated due to their location as suitable for tourism activities rather than any particular specific biodiversity interest, marine ecosystems at that time being perceived as being homogenously rich throughout the islands (**Proctor 1970**). The representative nature of the Protected Area Network has been assessed in recent years (**Senterre 2013, Klaus 2015**) and initiatives begun to address shortcomings most obviously in the marine domain through the Marine Spatial Planning Initiative (see **Section II 1.4**).

Problems persist however in addressing the effective management of these areas in pursuit of their specified objectives. The areas of ocean are vast and greatly outstrip current national capacities. A new Oceans Authority is to be formulated to govern the overall Marine Spatial Plan and to seek to harness and build capacities and realise synergies.

The terrestrial Protected Areas pose a different set of problems. Seychelles can boast some outstanding protected areas particularly on smaller islands such as Aride and Cousin Island Special Reserves. Also the Vallee-de-Mai Nature Reserve is considered a model of conservation management. There are several private islands that are run very effectively as ecotourism resorts (Cousine, Denis, Fregate and North islands) that have been at the forefront of national eradication, ecosystem rehabilitation and threatened species conservation. The Seychelles Protected Area Policy (**GoS 2013**) has provided a pathway for their designation as legal PAs to be enabled under the revised National Parks and Nature Conservancy Act when it is promulgated.

Excellent progress has been made in recent years by the Seychelles Island Foundation and its management of the Aldabra Special Reserve which has been independently assessed as excellent in area of land equivalent to a third of the country's entire surface area (See **Section III ABT 11**).

The terrain, vegetation and Invasive Alien Species Issues faced in the mountainous national parks of Mahe and Silhouette (See **Section II 1.6 and Section III ABT 9**) clearly exceed the current technical and financial capacities of the Seychelles National Parks Authority. These two the largest terrestrial Protected Areas in the central archipelago and the key centres for Seychelles' endemic biodiversity experience very limited management intervention to support conservation objectives. It is also apparent that the SNPA faces significant administrative problems (see **Section III ABT 7, Target 7.3 Forestry**).

**Relevant websites, web links and files**

See information in sections cross-referenced above.

**Other relevant information**, including case studies to illustrate how the measure taken has resulted in (or is expected to result in) outcomes that contribute to the implementation of the NBSAP

See the sections cross-referenced above for additional information.

**Relevant websites, web links and files**

See information in sections cross-referenced above.

**Obstacles and scientific and technical needs related to the measure taken:** Please describe what obstacles have been encountered and any scientific and technical needs for addressing these, including technical and scientific cooperation, capacity development activities or the need for guidance materials.

The huge areas and distance from centres of infrastructure in the marine Protected Area Network coupled with its ongoing revolutionary expansion under the marine Spatial Plan Initiative pose an enormous challenge to Seychelles. Innovative financing and the utilisation of cutting edge technologies appear to offer the main hope.

In the terrestrial domain the main national body (SNPA) clearly faces significant challenges and capacity shortfalls.

**Relevant websites, web links and files**

See information in sections cross-referenced above.

### 1.6. Invasive Alien Species

**For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes**

This implementation measure primarily supports Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

This implementation measure also provides support to other targets notably ABT 5, 15 and particularly ABT 12.

**Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:**

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective
- ☐ Measure taken has been ineffective
- ☐ Unknown

**Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above**

IAS is recognised as posing the primary threat to Seychelles terrestrial biodiversity (Nevill *et al* 2015) and Seychelles has made excellent progress in many respects in particular with regard to IAS eradication on small islands. Seychelles has put in place during the current reporting period a new national approach and governance structure to address IAS, but with new invasions being recorded quite regularly there is still clearly much work to be done. Likewise the key hotspot for Seychelles endemic biodiversity is between 200 and 500 m elevation on the islands of Mahé and Silhouette. These areas however are overrun and largely dominated by IAS correction of which is currently beyond available technologies and national capacity.

A much more detailed assessment with highlighted case studies is provided below.

**Relevant websites, web links and files**

See links below.

**Other relevant information**, including case studies to illustrate how the measure taken has resulted in (or is expected to result in) outcomes that contribute to the implementation of the NBSAP

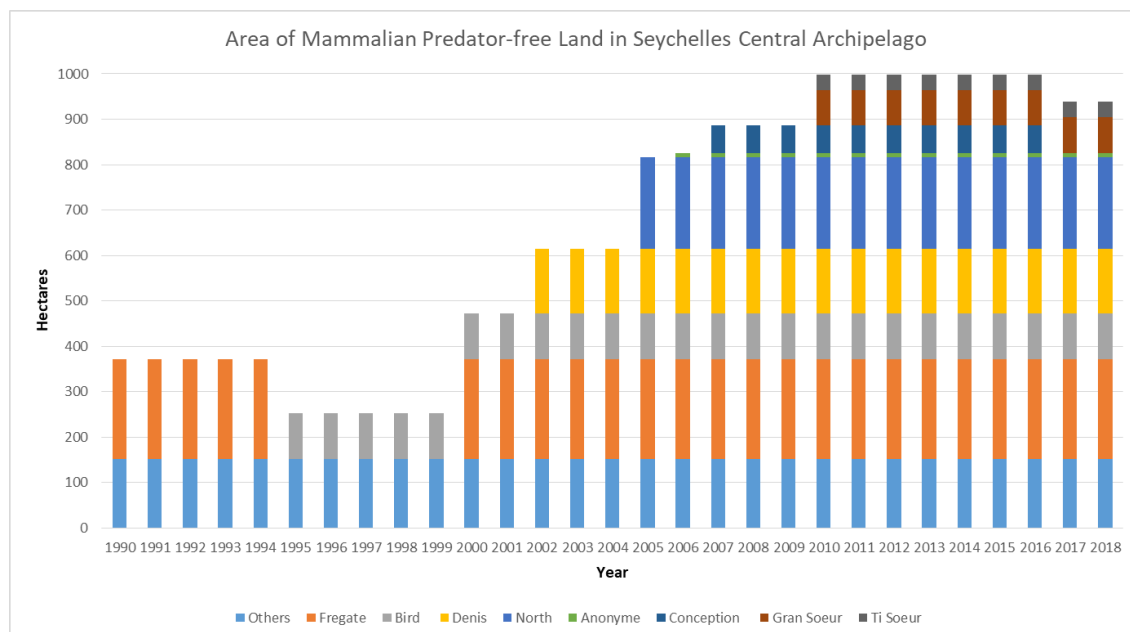
Seychelles as an evolutionary and geographically isolated island archipelago typifies the CBD definition of ecosystems most vulnerable to Invasive Alien Species (IAS). IAS are recognised as constituting the single



largest and primary threat to Seychelles endemic terrestrial biodiversity (Nevill *et al* 2015). The significant majority of Seychelles endemic terrestrial biodiversity occurs between 200 and 500 m elevation on the islands of Mahé and Silhouette. The dominant habitat in that zone is forest with associated inland waters and interspersed with xeric rock outcrops. As reported at length in previous national reports the vast majority (more than 95%) of the forest cover on the principal island of Mahé is secondary and dominated by introduced species many of which are considered to be highly invasive. This therefore represents degraded habitat that is most likely experiencing continuing deterioration through ongoing IAS spread and establishment. The island of Silhouette has much larger areas of primary/partially degraded forest cover and the scenario there is deemed to be significantly more positive. However in both instances there are no baseline data sets to indicate trends in endemic biodiversity and it is considered probable that ongoing invasive species incursion continues to degrade these habitats and reduce their value to endemic species.

Seychelles however has realised significant successes in the domain of IAS and is often cited internationally as an example for small island management in this regard. The eradication of alien mammalian predators i.e. cats and rats (*Rattus sp*), but also other mammalian species, notably goats (*Capra hircus*) has realised substantive and notable benefits to endemic biodiversity. This is particularly notable with regard to the eradication of rats and cats, coupled with habitat restoration on small islands, in the Seychelles central archipelago (see graph below) which has enabled remarkable species recoveries for several threatened endemic species (See **Section II 1.7** and **Section III ABT 12**).

**Figure 12. Area of Mammalian Predator Free Land in Seychelles Central Archipelago**



There is one key exception to this trend however and that is the establishment of Black rats (*Rattus rattus*) on Conception island at some point from 2015 onwards. This has resulted in the near total extirpation of the Seychelles white-eye (*Zosterops modestus*) – “Zwazo linet” – population on the island. This is of critical



importance to the species as this population represented the genetic base for the species. This occurrence also highlights issues with the approach to IAS in Seychelles (See Box 1).

Also highly significant is the eradication of various bird species, notably the Indian myna bird (*Acridotheres tristis*). This was reported on in the 5<sup>th</sup> national report regarding Denis Island and the resulting dramatic positive effect on endemic bird populations, this work continued and the Mynah bird has been successfully eradicated from the island (See **Case Study 1**).

### Information Box III: IAS and Lessons to be learned

There is a temptation, in light of the major conservation successes realised in Seychelles over the last 20 years, to consider IAS eradication a panacea and the first order of work in all terrestrial conservation initiatives. Events on Conception Island however have underlined that circumstances may be significantly more complex than that and a structured, holistic approach needs to be undertaken addressing each case as per its particular circumstances. The population of White-eyes on Conception was healthy and when discovered constituted 85% of the global population of the species. This despite the presence of Brown rats (*Rattus norvegicus*) on the island. Brown rats are markedly less arboreal in habit than the smaller Black rat (*Rattus rattus*) and this means White-eye nests and chicks are less vulnerable to brown rats. Indeed it was at the time considered likely that the presence of Brown rats at carrying capacity on the island represented an effective barrier to the colonisation by Black rats (*Rattus rattus*). Brown rats on Conception, therefore did not pose an existential threat to the White-eye population there and possibly protected it from the much greater threat of Black rats. The decision however was taken to eradicate brown rats on Conception and this was implemented in 2007. The White-eye population on the island did show a marked increase<sup>10</sup> following rat eradication highlighting that Brown rats were suppressing white eyes from their optimal population on the island. Conception, however, is an uninhabited island without infrastructure and therefore no viable protocol could be put in place to prevent future rodent colonisation of the island. Furthermore the island was not monitored regularly such that an incursion could be identified and eradicated early. In retrospect the folly of eradicating brown rats from Conception under these circumstances is clearly apparent. For the marginal benefit of increasing the population from 275 to 310 birds the island was exposed to the risk of a Black rat invasion. This tragically ensued and the core genetic population of the species has been lost.

An analogous situation recently arose in the management planning for Recif Island Special Reserve. Recif island is a small (13 ha) granitic island free of invasive mammalian predators. It was designated a Special Reserve in 2010 in recognition of and in order to protect its important seabird colonies. In 2018 the process to develop a management plan for the island was commenced. The key proposal in the draft plan was the eradication of feral rabbits on the island and the subsequent restoration of its vegetation. The logic being that the almost exclusively grassy vegetation of the island was being maintained by the grazing pressure of the introduced rabbit population. Consequently by removing the rabbit population it was postulated that a “natural” wooded vegetation structure could be restored. In actual fact the very first human accounts of Recif island describe it as being grass covered. Indeed it is this vegetation structure which enables the large ground nesting seabird populations. Historically the island also

<sup>10</sup> The population rose from 275 the population rose from 275 to 340 by 2009 before stabilizing at approximately 310.

supported a large population of giant tortoises. This population however was poached out some 220 years ago by passing vessels. The invasive rabbit population is therefore in this case fulfilling the grazing role of the former natural tortoise population and maintaining the habitat necessary to support the important seabird colonies. The thought process in the drafting of the management plan had clearly been that the key invasive species on the island was rabbits and therefore they must be having a negative impact upon the ecosystem and should be removed and their supposed impact reversed. Thankfully this shortcoming in the historical research of the island was identified in the final stakeholder review of the plan and the plan subsequently corrected.

Both of these instances underline the fact that the overall role and impact of an invasive species in an ecosystem must be considered and balanced before embarking upon otherwise well-intentioned eradication initiatives.

### **Case Study 1: The Impact of the Indian Myna (*Acridotheres tristis*) on Threatened Endemic Bird Species**

The Indian Myna (*Acridotheres tristis*) is believed to have been introduced to the main island of Mahé in the late 18th Century. It subsequently spread through the central archipelago where it established itself successfully on all but the smallest of the islands (Nevill, 2009). This omnivorous, intelligent and highly adaptable bird, nominated amongst “100 of the world’s worst invaders” by the Global Invasive Species Database, has long been recognised as a damaging invasive species in Seychelles in particular with regard to its potential for competition with endemic species and predation of their eggs and chicks (Komdeur 1996, Millet 2004, Nevill 2009). The true impact of the Myna bird on endemic biodiversity only became apparent however, on islands where other key invasive species had already been eradicated.

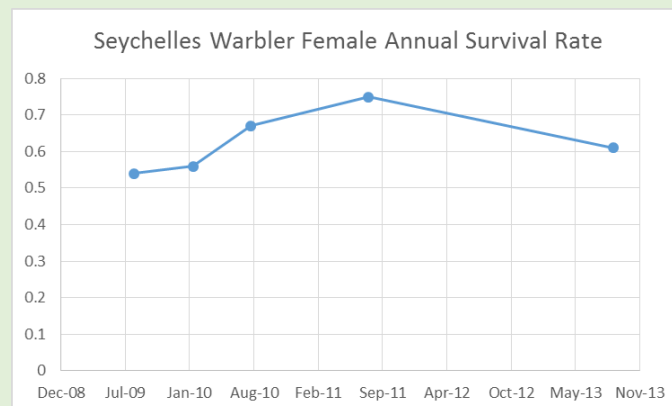


Indian mynas (*Acridotheres tristis*) on Denis Island in 2008. Photo © 2008 John Nevill

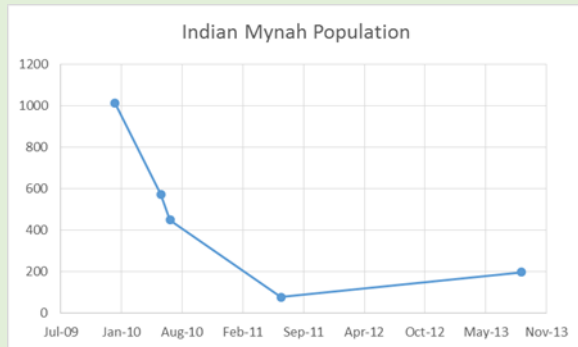
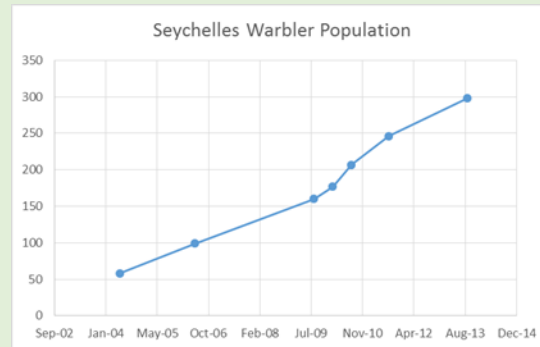
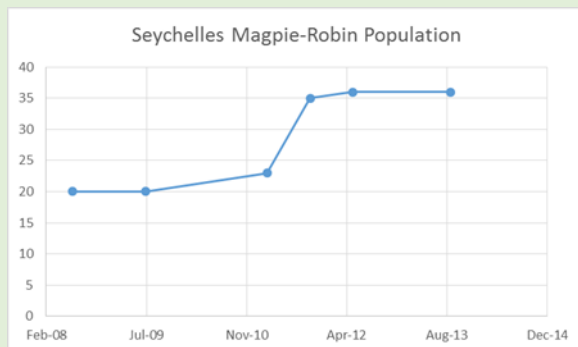
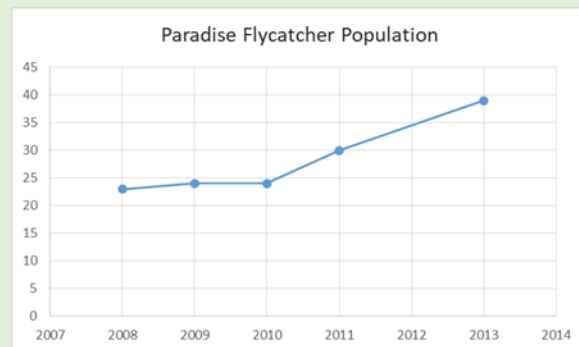
Denis Island (143 Ha) is a sand cay situated near the northern edge of the Mahé plateau. Cats and rats were eradicated from Denis Island in 2001 and 2002 respectively. This coupled with extensive habitat rehabilitation programmes enabled the island to contribute to national conservation initiatives through the introduction of threatened endemic species. In 2004, 58 Seychelles warblers (*Acrocephalus sechellensis*) from Cousin Island and 47 Seychelles fodies (*Foudia sechellarum*) from Fregate Island were transferred to Denis Island. In 2008, 20 Seychelles magpie robins (*Copsychus sechellarum*) (16 from Fregate Island and 4 from Cousin Island) and 23 Seychelles Paradise flycatchers (*Terpsiphone corvina*) from La Digue were introduced to Denis Island.

As time passed monitoring of the introduced populations provided indications of the negative impact of the Indian myna. The myna was recorded as the cause of failed Magpie robin breeding attempts, through nest destruction and the attacking of nestlings (Nevill 2009a). The attacks accounted for the loss of several chicks and were considered the main reason for the population numbering 20 (i.e. no increase) a year after introduction. During post translocation studies, Seychelles warblers, Fodies and female Flycatchers with severe head injuries and scars were observed (Feareet al 2015). Data from a 2006 warbler survey on the island indicated that the population was exhibiting a skewed sex ratio with significantly more males than females (Brouwer et al 2007)(see Fig 1).

**Fig 1. Warbler female annual survival rate 2009-2013.** (van der Woudeet al 2013) Survival rate rose and fell in negative correlation with the Myna population.

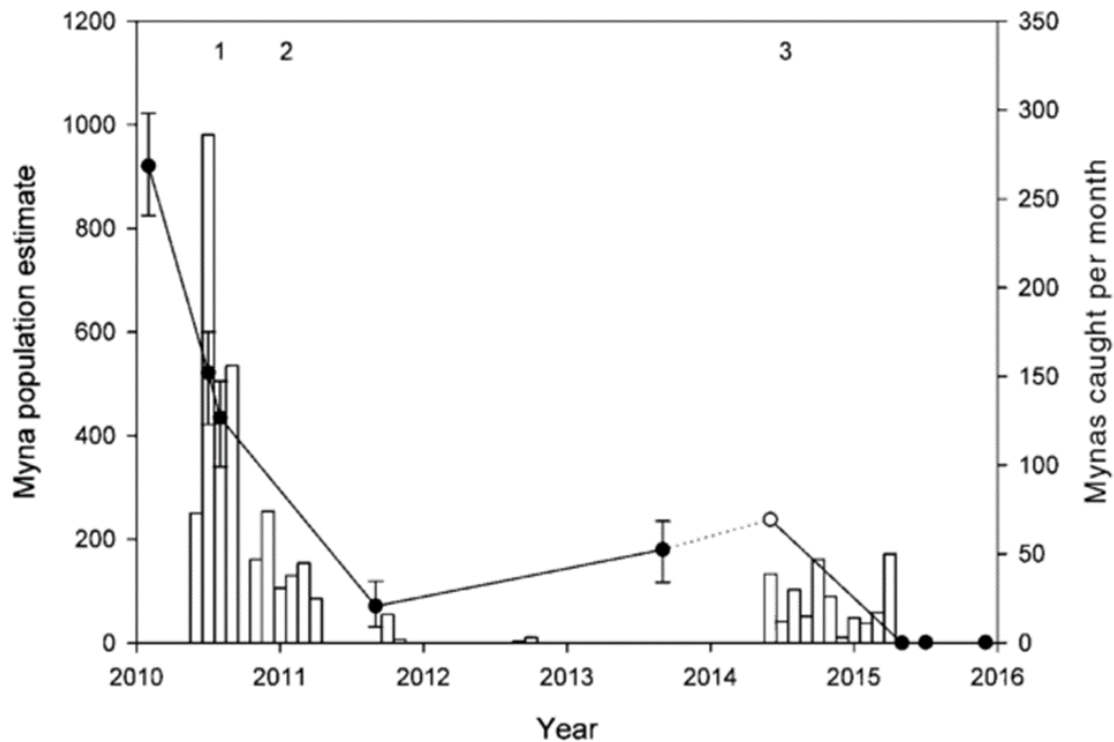


It was postulated and later found to be the case, through video observation of nests and the use of dummy warblers and artificial nests, that myna birds would attack incubating females resulting in similar head wounds to those being observed in the Denis populations (van der Woude & Neddermeijer 2010). Furthermore, reproductive success and population growth rates of the introduced endemic species were lower than expected based on previous translocations (van der Woudeet al 2013). This impact of Mynas on Denis on endemic birds was reported on in the fifth national report, with declining Myna population due to culling directly correlated to rapid increase in populations of the endemic birds (see Figs 2-5)(Nevill 2014). However at that time the eradication programme had been discontinued and the myna bird population was once again on the increase.

**Fig 2.Denis Island Myna Population 2009-2013****Fig 3.Denis Island Warbler Population 2004-13****Fig 4.Denis Isl. Magpie robin Pop. 2008-2013****Fig 5.Denis Island Flycatcher Pop. 2008-2013**

The eradication campaign was re-initiated in May 2014 culminating successfully in March 2015. Due to staffing shortages and logistical problems the eradication ultimately took place in three phases, overall killing 1186 myna birds and lasting five years. Decoy trapping was the most effective method of catching mynas, but the last birds were shot. In phase 1: 640 were killed; in phase 2: 260 were killed; in phase 3: 264 killed; a further 22 were caught in August and September 2011 and 2012 outside the main trapping phases (see Fig 6). Of the total killed 1120 were trapped and 66 were shot at the end of the project (Feare *et al* 2015).

**Fig 6. Estimated Myna Population line plot(left-hand y-axis), Monthly Myna cull bar chart (Right-hand y-axis) (Feare *et al* 2015)**



Monitoring of the endemic bird populations<sup>11</sup> on Denis during and after the Myna eradication clearly shows the direct impact of the Myna birds. **Figures 7-10** below are in scale and allow for direct population trend comparison.

**Fig 7.** Data compiled from (GIF 2019, Feareet *al* 2015, Nevill 2014) Photo © 2009 J. Nevill

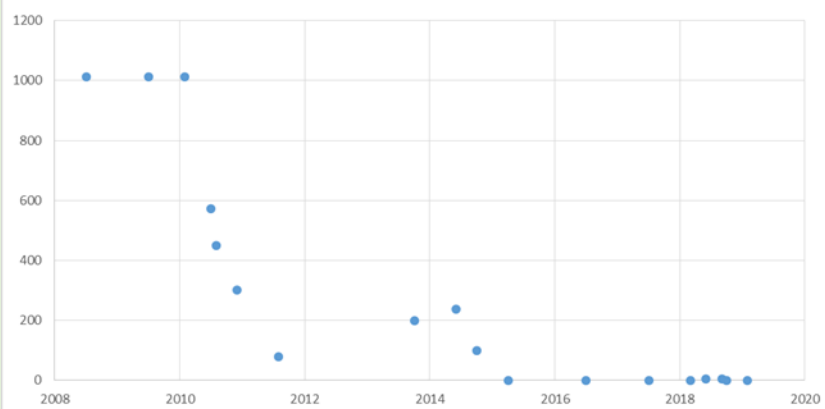
**Fig 8.** Data compiled from (GIF 2019, Bristol & Accouche 2019, Nevill 2014) Photo © 2009 J. Nevill

**Fig 9.** Data courtesy of Dr Rachel Bristol. Photo © 2008 J. Nevill

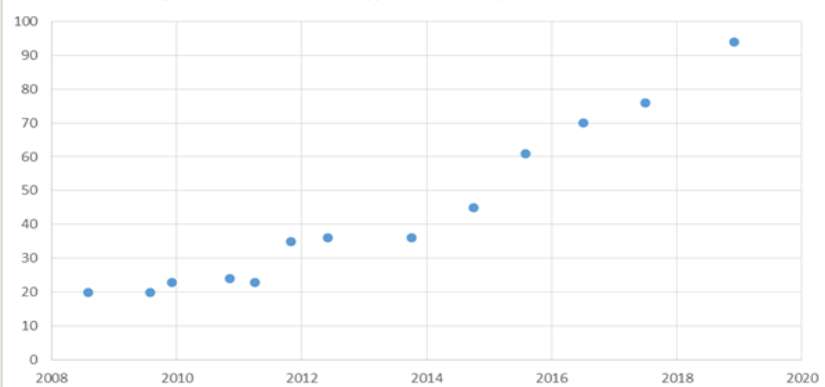
**Fig 10.** Data compiled from (GIF 2019, Nevill 2014) Photo © 2009 J. Nevill.

<sup>11</sup> Surveys were not undertaken on the Seychelles Fody population before or during the Mynah eradication programme so direct impact on that species, if any, is unknown.

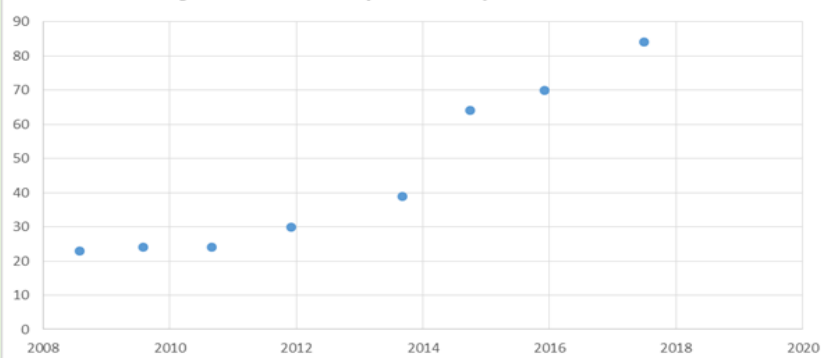
**Fig 7. Denis Island Myna Population 2008-2018**



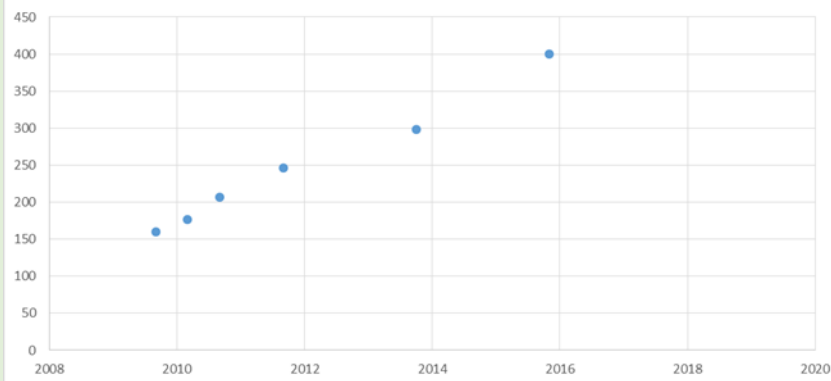
**Fig 8. Denis Island Magpie robin Population 2008-2018**



**Fig 9. Denis Island Flycatcher Population 2008-2018**





**Fig 10. Denis Island Warbler Population 2008-2018**

Following the successful eradication of Mynas on Denis Island. A campaign to eradicate Mynas was initiated on North Island in 2016. North Island (201 Ha) successfully underwent Cat and rat eradication in 2003 and 2005 respectively. In 2007, following extensive habitat rehabilitation, 25 Seychelles white-eyes (*Zosterops modestus*) were introduced to North from Conception Island. The population increased steadily post introduction 2007-2014 but then plateaued 2014-2016 (see fig).

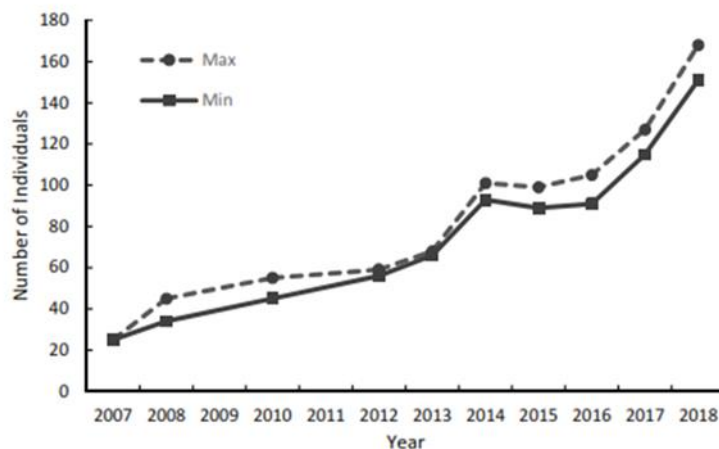
**Fig. 11 Annual North Island Seychelles white-eye population estimates 2007-2018 (Pietersen 2018)**

Photo courtesy Dr. G. Rocamora

The population showed a steep increase in 2017 however, that continued through 2018. Pietersen (2018) states: "The apparent plateau between 2014 and 2016 is believed to be as a result of breeding suppression due to Common Mynas (*Acridotheres tristis*), as the 2016–2018 population increases correspond to the period when Common Mynas were being actively eradicated from the island, with only two individuals remaining at the end of the 2018 survey period."

The findings on North Island therefore reinforce those of Denis Island and underline the importance of eradicating Indian mynas from islands with threatened endemic bird species or where endemics are going to be introduced, and maintaining those the islands Myna free.

Compiled by John Nevill.

The Seychelles Islands Foundation (SIF) has continued its ground breaking work on IAS management with successful eradications of the Red-whiskered bulbul (*Pycnonotus jocosus*) and Madagascar fody (*Foudia madagascariensis*) from Assumption island and Aldabra atoll, in the case of the former species this also constituted a national eradication. The Ring-necked parakeet (*Psittacula krameri*) was subject to an extended eradication campaign on the principal island of Mahé (See case study 2) with no specimens having been recorded for 8 months so far in follow up surveys<sup>12</sup>.

### Case Study 2: Ring-necked parakeet (*Psittacula krameri*) case study.

The Ring-necked parakeet (*P. krameri*) is one of the most successful avian invaders in the world having established populations in over 35 countries outside its native range (GISD 2018). It is believed that the species was introduced to Seychelles as a caged pet in the mid-1970s (Butler 2003) in what would have constituted an illegal importation. At some point subsequent to this importation birds were either released or escaped into the environment exact dates are not known however a wild population was noted from the mid-1990s onwards on the principal island of Mahé.



(nbu2012/Flickr) Photo License: (CC BY 2.0)

The establishment of ring-neck parakeet (RNP) and its growing population represented a significant threat to the endemic Seychelles black parrot (*Coracopsis barklyi*) (see case study 4), which occurs on the island of Praslin and situated approximately 37 km north-east of Mahé. A threat both in terms as a direct competitor for nesting sites and food as well as a potential vector of avian diseases such as the Beak and Feather Disease Virus (BFDV), of which *P. krameri* can serve as a carrier, and which threatened the survival of endemic parrots elsewhere in the world. The Seychelles Islands Foundation (SIF) recognised the RNP as the most pressing threat to the black parrot, many of which live and breed in the Vallee-de-Mai world Heritage site and nature reserve managed by SIF, and resolved to undertake pre-emptive action.

Population estimates were carried out by standardised roost counts for the RNP on Mahé, giving a pre-eradication campaign population estimate of 288 birds. Culling operations commenced in 2013. The threat posed by the RNP was confirmed in September 2014 when a bird was recorded on Praslin, this

<sup>12</sup>This campaign was confirmed as having been successful in March 2019.



followed by a previous record of the bird on the island of Silhouette, providing ample evidence of its ability to fly between the islands.

In the first phase various methods were utilised: trapping, canopy mist netting, ground mist netting, nest cavity targeting, shooting a long flight lines and feeding areas. Roosts were not targeted as it was feared that this may disburse the population making eradication much more difficult. The capture rate, efficiency cost and labour intensiveness of these methods was assessed and informed the choice of focal method for the main phase of eradication.

Mist netting caught 25 birds but quickly became ineffective as the birds learned to avoid the nets. Trapping caught no birds - several specialised trap designs including the use of decoys were unsuccessful.

In phase 2 primary methods utilised were shooting a long flight paths and feeding areas with shot gun. RNPs proved to be highly intelligent, it is believed that they learned to recognise and avoid the project car and people and staff uniforms. Shooting therefore had to be undertaken very carefully: from cryptic locations, wearing camouflage and targeting solo or pairs of birds and only shooting when the hunter was very confident of success. The total number of birds culled was 545 - 543 on Mahé, 1 on Silhouette and 1 on Praslin.

The third and final phase of eradication consisted of monitoring roost and feeding tree is at all known sites to confirm that no individuals of the target species remained. Monitoring was implemented in 2 to three-week periods by a team of 2 to 4 local staff, every 3 to 6 months and confirmed a successful in March 2019.

A key component of the project and one that was central to its success was that of public outreach. Public reporting of sightings was essential in identifying all locations species. Outreach was also vital to educate the public on the need for the eradication of this otherwise charismatic species.

Compiled by John Nevill from **Bunbury *et al* (2017)**, with additional information from **CABI (2018)**, **GISD (2018)** & **Meriton-Jean (2014)**.

The National Biosecurity Agency was established on 1<sup>st</sup> November 2016 (see **Box 2**).

#### Information Box IV: National Biosecurity Agency

The Animal and Plant Biosecurity Act (**GoS 2014c**) was promulgated on 28 April 2014 and repealed the Animals (Diseases and Imports) Act (1981), the Plant Protection Act (1996) and the Plant Protection and Veterinary Services (Biosecurity) Function Order (S.I. 88 of 2011). This act set out a new legislative framework for the prevention, control and eradication of animal and plant pests and diseases into Seychelles. On 15 September 2014 the Seychelles Agricultural Agency (SAA) was designated as the agency responsible for biosecurity (**GoS 2014d**). The National Biosecurity Agency (NBA) was established on November 1, 2016 under the same Act and replaced the SAA in that role.

The NBA functions therefore to prevent the introduction and spread of animal and plant pests and diseases. It works closely with diverse national agencies to control the vectors and pathways for IAS introduction and spread. Within the national borders its focus is upon agricultural and livestock pests. IAS that impact upon native biodiversity and broader ecosystem services falls under the portfolio responsibility of MEECC.

The establishment of an agency dedicated exclusively to the prevention, control and eradication of IAS reflects the vulnerability of Seychelles to socio economic and environmental losses driven by IAS incursion. The NBA however faces diverse and complicated problems and whilst it has realised certain prominent successes it has also experienced various challenges with new invasive species being recorded fairly frequently this continues a trend which has been ongoing for at least 15 to 20 years (see **Table XX** below) exacerbated perhaps by Seychelles growing role as a regional shipping hub, the high national dependence upon imports and the diversifying nature of the national economy.

**Table 5: Significant Pest Species Introduced in Last 20 years.**

Species	Recorded	Notes.
Melon Fruit Fly <i>Zeugodacus cucurbitae</i> (formerly <i>Bactrocera cucurbitae</i> )	Nov 1999	First recorded near the airport in lure traps of the national monitoring network ( <b>Stonehouse et al 2000</b> ).  A pest of melons and related crops (Cucurbitid species) spread rapidly in Seychelles and become a major pest ( <b>Nevill 2009</b> ). 80-90% of farmers producing cucurbits switched to root crops. Various chemical treatments have been trialled ( <b>Oke &amp; Sinon 2013</b> ) but ultimately did not control the pest. A very significant economic pest causing losses of some US\$ 4.3M per annum as locally high value cucurbit crops are being affected ( <b>Moustache 2015</b> ). GoS launched a new control project in March 2019 using traps with pheromone lures for males – Male Annihilation Technique – in an attempt to reduce numbers to a level where a Sterile Insect technique can be effectively applied ( <b>SNA 2019</b> ).
Spiralling Whitefly <i>Aleurodicus dispersus</i>	March 2003	A highly polyphagous pest of crops and ornamental species. It causes damage through: i). piercing and sucking the sap from foliage ii). Secretion of honeydew causing sooty mould, and iii). virus transmission. Spread very rapidly after introduction throughout the central archipelago becoming a serious pest of a wide variety of ornamental and crop plants and poses a serious threat to the general flora of Seychelles from coastal areas to 300m elevation ( <b>Nevill 2009</b> ). It has also been recorded in outer

		islands such as Alphonse and Desroches (Rocamora & Henriette 2015).
Coconut whitefly <i>Aleurotrachelus atratus</i>	January 2007	Spread rapidly through the main granitic islands and reported on 12 species of palm including 4 endemic species: <i>Deckenia nobilis</i> , <i>Nephrosperma vanhoutteanum</i> , <i>Phoenixium borsigianum</i> and <i>Verschaffeltia splendida</i> and thus a treat to biodiversity (Nevill 2009).
Eggplant borer <i>Leucinodes orbonalis</i>	Nov 2009	First recorded on La Digue and despite best efforts had spread to Mahe by mid-2011. A pest of economic significance in Seychelles (Moustache 2015) with production losses of approximately 70% reported (NISA 2012).
Papaya mealy bug <i>Paracoccus marginatus</i>	January 2013	Mainly observed In Seychelles on papaya (pawpaw) and it is also widespread on ornamental plants like frangipani and hibiscus (NISA 2013). Infestation appears on leaves, stem and fruit as clusters of cotton-like masses. Pest of economic significance causing important agricultural losses (Moustache 2015).
Hairy caterpillar (Sphrageidus sp. ACZ2526)	January 2015	<p>This species spread rapidly with two main impacts. A direct human impact of a skin rash, sometimes severe, is produced after coming into contact with the caterpillars stinging hairs, hairs that detach and can often be windborne. Contact with the stinging hairs can also lead to inflammation of the eyes and respiratory systems (SNA 2015).</p> <p>The species can also cause defoliation significantly reducing the development and productivity of various plant and tree species (NBA 2017). Over 25 plant hosts have been identified to date including: Indian almond (<i>Terminalia catappa</i>), Mango varieties (<i>Mangifera indica</i>), Golden apple (<i>Spondias dulcis</i>) and Jamalac (<i>Syzygium samarangense</i>) all common and important species.</p> <p>A major chemical spraying and fogging effort to manage hairy caterpillar populations spraying and fogging, but such resulted in detrimental effects on other species including a particular apparent collapse in the populations of the Red-legged golden orb-weaver spider (<i>Nephila inaurata</i>), leading the ministry to stop fogging. (NISA 2019).</p>
Black Fungus gnat (Sciaridae spp)	2015	First noted in 2015 when occurring in dense swarms on the Islands of Mahe, Praslin and La Digue. The widespread nature of their occurrence indicating that the insect had likely been in the country for some years. The actual species has yet to be classified (NISA 2016). The gnat is problematic for people and businesses, swarming around lights, getting in to food, drinks, mouths and eyes etc... making normal comfortable activities

		impossible. Can cause quite severe reaction when they get in the eye and skin rashes for some people.
Asian Citrus swallowtail butterfly <i>Papilio demoleus</i>	2016	Widely established and common ( <b>See Info Box V</b> )
Tomato leaf miner <i>Tuta absoluta</i>	January 2017	Successfully eradicated ( <b>See Info Box VI</b> ). Second incursion recorded in March 2018.
Tortoise beetle <i>Aspidimorpha quinquefasciata</i>	February 2017	Successfully eradicated. First observed at New Port feeding on Beach morning glory ( <i>Ipomea pes-caprae</i> ). The area was sprayed with deltamethrin on the 24th February. Following by regular monitoring within the whole New Port area, in Zone 14 (Perseverance) and along the Northern and Eastern coast. 28th June 2017 the beetle was reported for a second time and the procedure was repeated, spraying with 2 different insecticides. On 29th January 2018, recorded for the 3rd time, feeding on morning glory. Two sprayings were conducted and from 19th February to date no signs of the pest have been observed  (pers comm. Mr. R. Moustache, National Biosecurity Agency).
Fall Army worm <i>Spodoptera frugiperda</i>	July 2017	Unsuccessful eradication ( <b>See Info Box VII</b> )

### Info Box V: Asian Citrus swallowtail butterfly (*Papilio demoleus*)

First documented in Seychelles in November 2016 on Mahé Island. It is not known how it was introduced to Seychelles, but importation of citrus stock bearing eggs or young caterpillars seems likely. It spread rapidly and the beautiful butterflies are now to be seen throughout Mahé and are now the butterfly most commonly seen.

The species feeds on plants of the citrus family (*Rutaceae*). It is reported from elsewhere that it particularly impacts small bushes and young trees where the larvae feeding on leaves can cause the complete and repeated defoliation, and even death, of those plants (CABI 2018a). This is particularly prevalent in citrus orchards. Larvae may also utilise young leaf growth on mature trees.



Photo: © 2019 John Nevill.

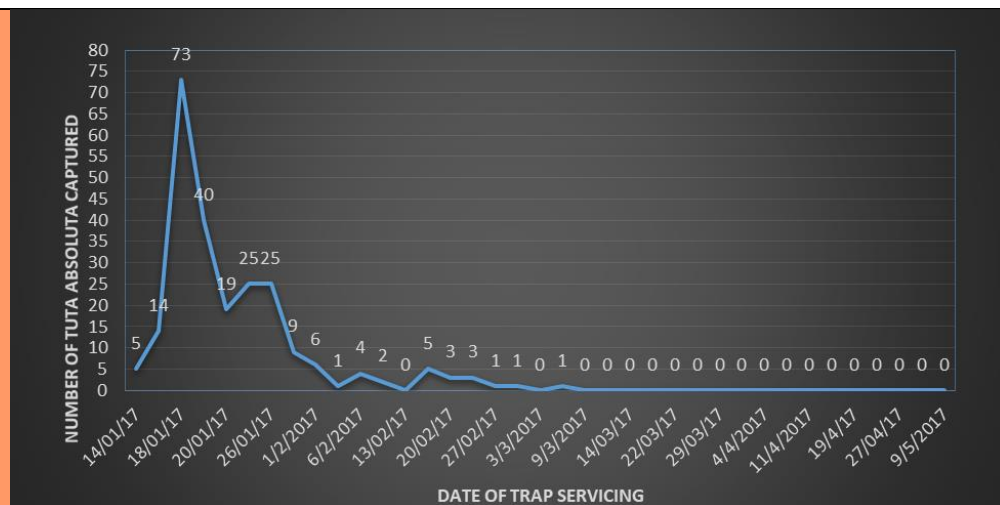
The species is reported to have a 43 day life-cycle (Raut *et al* 2018), flying adults are apparent every month on Mahé indicating that the species is breeding year round. At time of writing impacts on citrus production have not been reported but with apparent abundance of the species now on Mahé such reports are anticipated.

John Nevill.

### Info Box VI: Tomato leaf miner (*Tuta absoluta*)

Following the detection of the tomato leaf miner an emergency response plan was implemented to contain the spread of the pest and reduce its population. Actions undertaken included: request to farmers to immediately stop selling tomato seedlings and movement of plants between farms; application of a broad spectrum insecticide to tomato plots (Suntap) and removal of old plants and burning of plant debris. A total of 84 pheromone traps on Mahé and 5 on Praslin were installed for mass trapping and monitoring. Furthermore a total of 236 adult moths were caught between 14th January and 6th March 2017. Thereafter no adults had been caught until March 2018. This is when the NBA detected a second incursion of the pest on La Digue. A similar response plan was implemented however, eradication has not been achieved to date.

Graph below shows the *T. absoluta* trap counts for a period of 4 months in the first incursion.

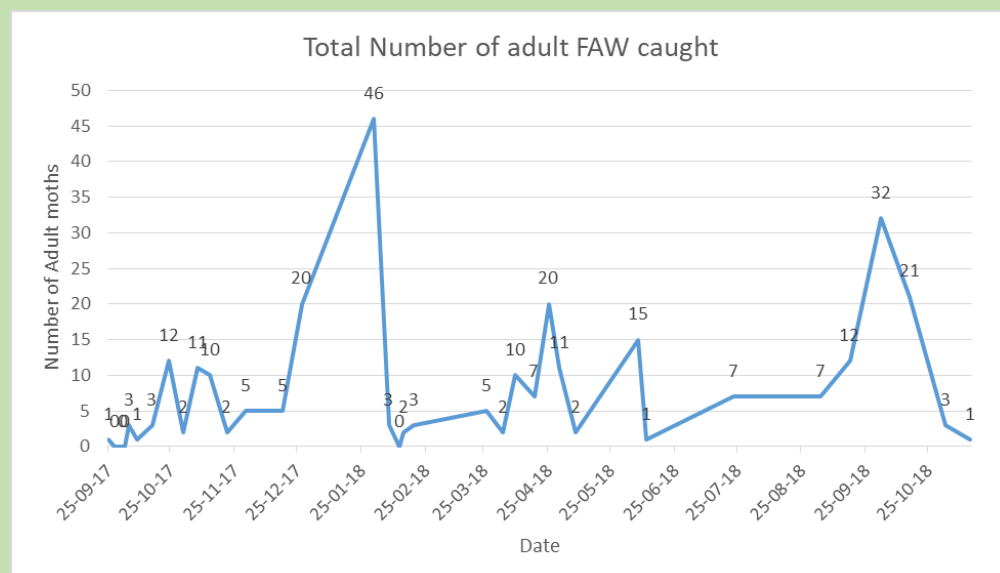


Information provided by Mr. R. Moustache, National Biosecurity Agency.

#### Info Box VII: Fall Armyworm (*Spodoptera frugiperda*)

Following the first observation of this pest (28/07/17) an emergency response plan was implemented. A total of 40 pheromone traps were set up on Mahé, 5 on Praslin and 2 on La Digue. Unfortunately the pest could not be contained in the area where it was first observed and quickly spread to the Eastern, Western and Northern parts of Mahe. The adult is known to be a very strong flier. On the 15th December adults were caught in traps on Praslin and soon on La Digue. The focus now is on management of the pest through an IPM approach.

Graph below shows the catch of adults in pheromone traps on Mahé.



Information provided by Mr. R. Moustache, National Biosecurity Agency.

The NBA works closely with MEECC and certain aspects of IAS prevention, control and eradication are dealt with by the Ministry, congruent to its specific capacities. Information was also obtained from MEECC in that regard and is summarised in **Info Box VIII** below.

<b>Information Box VIII: Department of Environment Invasive Species Update 2014-2018</b>	
Species	Details
<i>Corvus splendens</i> Indian House Crow 8 specimens	This voracious predator of native birds' nests is a regular arrival on Seychelles shores hitching as it does, lifts, on fishing and cargo vessels that pass by or come to Seychelles. The crows are shot with aide of police marksmen whenever they enter.
Passer Domesticus House sparrow 5 specimens	Another invasive species that uses shipping as a vector. All 5 were shot by police marksmen.
<i>Phelsuma grandis</i> Madagascar day gecko 1 specimen	Captured at the fishing port suspected to have come over on a Tuna vessel that had recently visited Madagascar.
<i>Otolemur garnetti</i> Greater galago (Bush baby) 2 specimens	2 Bush babies ( <i>O. garnetti</i> ) have arrived in the country during this period both suspected to have come on boats from Zanzibar.  The first was captured on board a vessel in port and returned to Zanzibar. The second was captured but subsequently re-escaped and remains at large.
<i>Tyto alba affinis</i> Southern African barn owl	Introduced in the 1950s is an ill-informed attempt at biocontrol of rats. The Barn owl focused rather on sea birds and is believed to be responsible for the near extirpation of breeding seabirds like the White tern ( <i>Gygis alba</i> ) on the main granitic islands. The Barn owl spread rapidly throughout the central archipelago particularly targeting sea bird colonies. It has also been recorded to take endemic birds such as the Endangered Magpie robin ( <i>Copsychus sechellarum</i> ). There are consequently open ended control programmes on many of the smaller islands. On the main islands the Government maintains a bounty on the bird as a population suppression measure. 114 barn owls were brought in by the public to collect the bounty during the reporting period.



Information provided by Mr Ashley Pothin, Conservation Officer (MEECC)

#### Relevant websites, web links and files

- 1). National Biosecurity Agency. [www.nba.gov.sc](http://www.nba.gov.sc)
- 2). GoS/UNDP/GEF. IAS Technical reports. <https://www.pcusey.sc/index.php/publications#>
- 3). Ministry of Tourism, Civil Aviation, Ports and Marine – Biosecurity. <http://tourism.gov.sc/risk-management/biosecurity/>
- 4). Ministry of Environment, Energy and Climate Change. <http://www.meecc.gov.sc/>
- 5). Ministry of Fisheries and Agriculture. [www.mofa.gov.sc](http://www.mofa.gov.sc)
- 6). Seychelles Agricultural Agency. [www.saa.gov.sc](http://www.saa.gov.sc)

#### Obstacles and scientific and technical needs related to the measure taken:

The key obstacles to Seychelles better implementation of Biosecurity and IAS management (i.e. prevention, control and eradication) are:

Lack of understanding of IAS impact on endemic and native species of forest ecosystem and in particular the 200-500m elevation.

The lack of survey and assessment of marine IAS in Seychelles is potentially a matter of key concern particularly with regard to Seychelles growing role as a shipping hub in the region.

The lack of capacity to effectively prevent new incursions through ports and airport, including trained inspectors and taxonomists.

#### Relevant websites, web links and files

- 1). National Biosecurity Agency. [www.nba.gov.sc](http://www.nba.gov.sc)
- 2). GoS/UNDP/GEF. IAS Technical reports. <https://www.pcusey.sc/index.php/publications#>
- 3). Ministry of Tourism, Civil Aviation, Ports and Marine – Biosecurity. <http://tourism.gov.sc/risk-management/biosecurity/>
- 4). Ministry of Environment, Energy and Climate Change. <http://www.meecc.gov.sc/>



### 1.7. Threatened Species Conservation

**For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes**

This measure addresses Aichi Biodiversity Target 12 specifically and has a cross-cutting contribution to several others.

**Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:**

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective
- ☐ Measure taken has been ineffective
- ☐ Unknown

**Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above**

Seychelles has made significant progress in certain domains such as threatened endemic bird species and the management of specific rookeries for threatened marine turtles. However there are significant areas where progress is poor (particularly in the marine domain) or status is largely unknown namely the centre of Seychelles endemic biodiversity being 200-500m asl on the islands of Mahe and Silhouette.

**Relevant websites, web links and files**

N/A.

**Other relevant information**, including case studies to illustrate how the measure taken has resulted in (or is expected to result in) outcomes that contribute to the implementation of the NBSAP

Seychelles has an outstanding record in the conservation of endemic birds beginning with private initiatives and the work of the Royal Society for the Protection of Birds and the International Council for Bird Preservation (latterly BirdLife International). Over the last 20 plus years these efforts have been undertaken by local NGOs and the Department of Environment, in partnership as necessary with international agencies (in particular certain universities). The positive progress has continued and is summarised in **Table 6** "Globally Threatened Endemic Bird Species in the Central Archipelago". It is further detailed by an update on the Seychelles Magpie Robin (*Copsychus sechellarum*) (**See Fig 13**) and case studies on the Seychelles paradise flycatcher (*Terpsiphone corvina*), the Seychelles black parrot (*Coracopsis barklyi*) and the Seychelles White-eye (*Zosterops modesta*). It is important to note that the success of endemic bird management has to a very great extent been directly related to the management of IAS (notably the

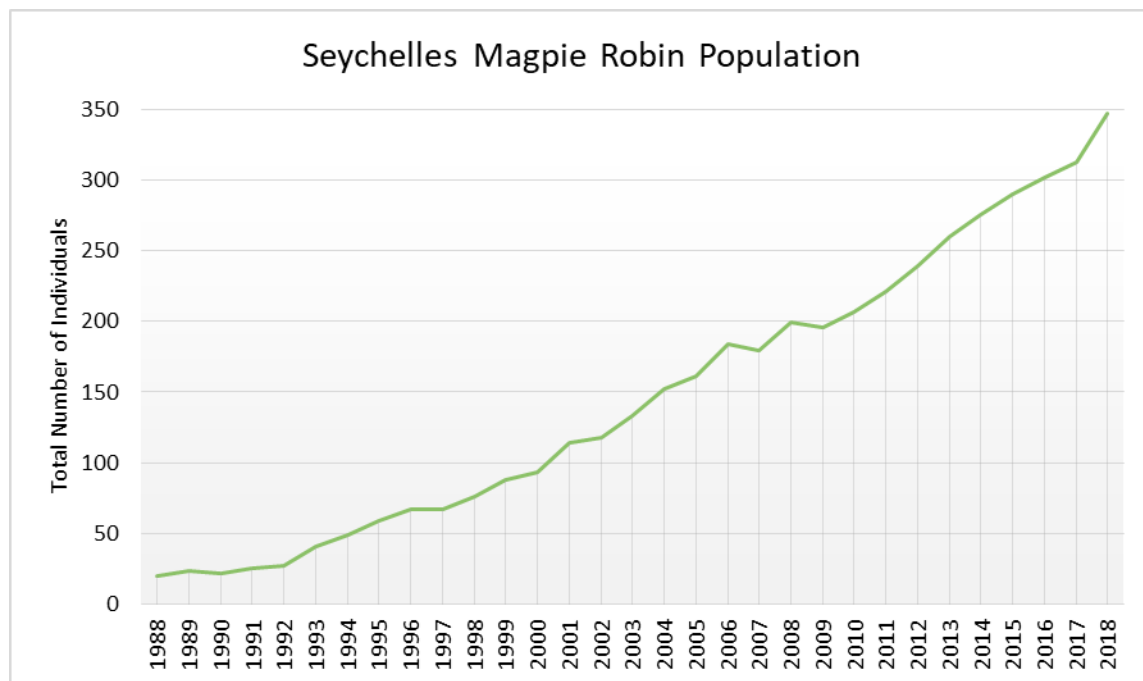
eradication of rats and cats) and the rehabilitation of small island ecosystems (See 1.6 above and 1.8 below respectively).

Table 6: Globally Threatened Endemic Bird Species in the Central Archipelago				
Species	IUCN Status			Notes
	1997	2014	2018	
Seychelles Magpie Robin ( <i>Copsychus sechellarum</i> )	CR	EN	EN	Once reduced to as a few as 12-15 birds confined to Fregate island. Conservation actions including introductions to Cousin, Cousine & Aride islands saw it down listed to Endangered in 2006. Its subsequent successful introduction to Denis Island in 2008 and eradication of Indian Mynahs there has resulted in significant population growth - 283 birds by 2015 and 350 birds by 2018 ( <b>see fig 13</b> ). The proposed introduction to North island, a large, invasive predator free island, with extensive habitat bodes well for the future ( <b>BirdLife International 2017, 2019a</b> )
Seychelles White-Eye ( <i>Zosterops modestus</i> )	CR	EN	VU	Re-categorised to Endangered in 2006 following successful conservation action, including introductions to Fregate and North Islands, and then to Vulnerable in 2016 once the population was confirmed at > 250 mature individuals ( <b>BirdLife International 2016f</b> ). Disaster struck with the Black rat ( <i>Rattus rattus</i> ) invasion of the key (relict/founder) colony of Conception Island, resulting in a catastrophic collapse and near extirpation of the White-eye there. This was discovered in 2017. The species RedList status was reviewed in May 2019, and it was decided it should remain as Vulnerable (VU) because the Conception population reduction was considered a one-off event and the overall population is expected to increase over time due to the Fregate and North Island populations ( <b>BirdLife 2019b</b> ).
Seychelles Paradise Flycatcher ( <i>Terpsiphone corvina</i> )	CR	CR	CR	Once reduced to a single viable population on La Digue Island with ongoing loss of habitat area. The Flycatcher was introduced to Denis Island in 2008. The 2016 IUCN assessment states that the species will merit down listing “after five years” if both populations are still self-sustaining ( <b>BirdLife 2016e</b> ). A 2017 census ( <b>Bristol et al 2017, Bristol &amp; Gamatis 2017</b> ) recorded 452 birds (La Digue 368, Denis Island 84). 20 birds were introduced to Curieuse island from La Digue in December 2018 in an attempt to establish a third viable population. A further introduction to Curieuse this time from Denis Island is planned for 2019.
Seychelles Scops Owl	CR	EN	EN	Restricted to the mountains of the main island of Mahe. Down listed to Endangered in 2006 as latest research ( <b>Currie</b>

<i>(Otus insularis)</i>				<i>et al 2004</i> ) indicated population may be as high as 250-284 mature individuals and apparently stable (IUCN 2012). Population estimated in 2016 as 249-300 (Birdlife International 2016d).
Seychelles Warbler <i>(Acrocephalus sechellensis)</i>	VU	VU	NT	On the verge of extinction in the 1960s with only some 25-30 birds confined to Cousin Island, the warbler is perhaps Seychelles greatest single conservation success story. Introduced to Aride (1988), Cousine (1990), Denis (2004) and Fregate (2011) islands. The species was downgraded to Near Threatened in 2016 with the global population estimated at 3,000 mature adults (320 Cousin, 210 Cousine, 1,850 Aride, c. 500 Denis, c. 150 Fregate). (Birdlife International 2016& 2019).
Seychelles Fody <i>(Foudia sechellarum)</i>	VU	NT	NT	At one stage reduced to 3 small island populations. Down listed to Near Threatened in 2006 following introduction to Aride and Denis islands. 2016 assessment gave population estimate of 2,300 mature adults on 6 islands with population trend increasing. (Birdlife International 2018).
Seychelles Kestrel <i>(Falco araeus)</i>	VU	VU	VU	A very interesting species that appears to have undergone a severe population collapse 1940-1960s, to an effective population size of 8 individuals (Groombridge <i>et al</i> 2009), likely due to the use of organochlorine pesticides and rebounded effectively on the main island of Mahe. Birdlife International 2016 assessed the population as stable at 530 mature individuals across 6-10 islands.
Seychelles Swiftlet <i>(Aerodramus elaphrus)</i>	VU	VU	VU	2016 assessment indicated population of 1,700-2,000 mature individuals (BirdLife International 2016a). Listed as Vulnerable as it nests in three sites with some 95% of all breeding birds concentrated at one cave. Nesting caves are vulnerable to disturbance (2 sites have historically been lost). Overall population trends are unclear, but suspected to be stable. If contraction of its breeding range continues, or populations are shown to be undergoing a continuous decline it should be uplisted to Endangered.
Seychelles Black Parrot <i>(Coracopsis barklyi)</i>			VU	Only recognised as a distinct species in 2015 (del Hoyo <i>et al</i> 2015). The breeding population is restricted to just one island. The 2016 IUCN assessment, based on Reuleaux <i>et al</i> 2013, population stable at 340-600 mature individuals (BirdLife International 2016b). Recent genetic analysis (Jackson <i>et al</i> 2016) however indicates the population went through a severe bottleneck over the last 100 years due to range contraction and habitat loss, resulting in a genetically impoverished population more prone to stochastic events.  This makes monitoring of the population and enhanced conservation measures even more important. On a very positive note the 2018 census recorded a minimum black

				parrot population of 1096, this including fledgling and juveniles (i.e. birds less than three years old).

**Figure 13. Seychelles Magpie Robin Population 1988-2018**



(Figure Courtesy of SMART, Nature Seychelles)

### **Case Study 3: The Seychelles Paradise flycatcher (*Terpsiphone corvina*) - status, trends and conservation.**

(Nevill, J.E.G. & Bristol, R. 2018)

The Seychelles Paradise flycatcher is a critically endangered small, sexually dimorphic passerine. Historically it occurred on at least five islands in the Seychelles: Praslin, Aride, Marianne, Felicite and La Digue (**Newton 1867, Diamond 1984, Bristol *et al* 2013**). However due to habitat loss (forest clearance) and predation by invasive alien species the range was reduced to a single viable population on the island of La Digue and that largely restricted to wooded areas on the Western plateau of that island.



Male and female Seychelles Paradise flycatchers (*Terpsiphone corvina*) Photos © 2008 John Nevill.

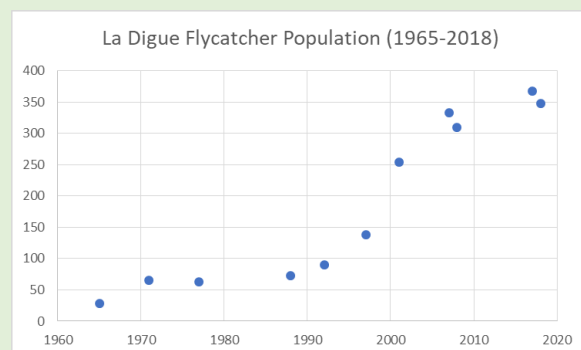
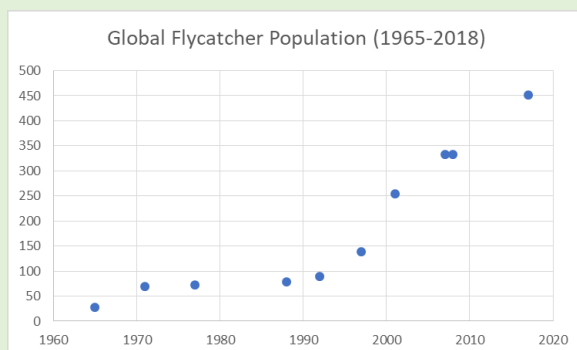
There have been various population assessments from the latter half of the 20<sup>th</sup> century to date that, whilst not directly comparable, indicate a significant increase in the population of the species since the 1960s.

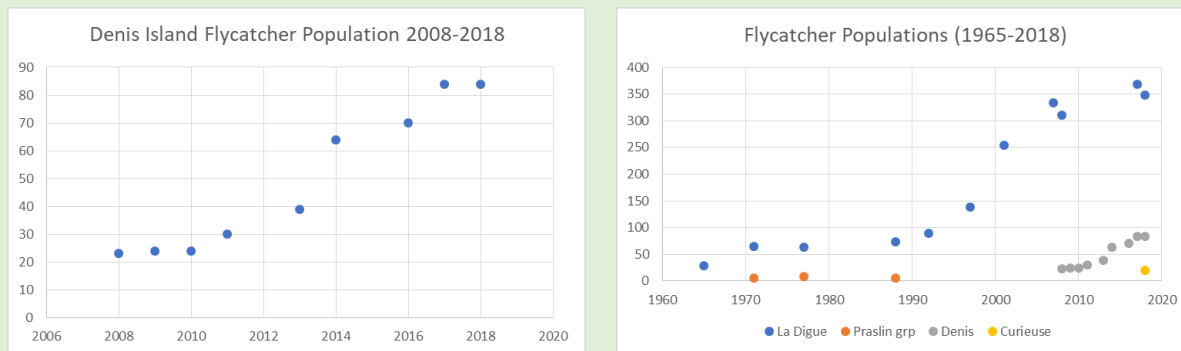
Study	Population estimate	Notes
1965 (Gaymeret <i>et al</i> 1969).	28	Noted that the species was confined to the wooded plateau areas of La Digue, where a maximum of 28 birds were counted in 1965.
Beamish 1972	50-90	Estimated between 50 and 80 on La Digue and noted that a small colony was reported on the south-west coast of Praslin.
1977-78 (Watson 1991)	71 (70-75)	Total population estimated to be 70-75, of which 60-65 occurred on La Digue. 80% of total population on western plateau of La Digue.
1988 (Watson 1991)	78	61 on west plateau, 12 elsewhere on La Digue, 5 estimated on other islands.
Neufeld 1992 (Neufeld 1998)	90	64 birds on the western plateau of La Digue. 7 more birds were recorded east of the area bounded by the drainage system on the western plateau. 19 birds were recorded in other coastal areas.
Rocamora 1997	157	1996 survey confirmed 69 territories plus 16 probable territories (138–175 individuals), subsequently extrapolated to c. 150–200 individuals.
2001 (Currie <i>et al</i> 2003)	254 (218-290)	60-70% of the population occurs on the western plateau of La Digue. Small populations on adjacent islands deemed “ephemeral and not self-sustaining”.  This survey found territories to be more widely distributed than previously reported, being also now found in hillside woodland habitat.

Bristol 2007	333 (286-380)	
2008		In 2008, 23 flycatchers were introduced to Denis Island from la Digue, lowering the La Digue population to 310.
Bristol 2009-2016		Denis Island population has been monitored closely (by Bristol, R.M.) and has prospered following the control and subsequent eradication of the Indian Mynah ( <i>Acridotheres tristis</i> ) on the island ( <b>see CaseStudy 1</b> ).  Census counts: 2009: 24, 2011: 30, 2013: 39, 2014: 64, 2016: 70
2017 Bristol <i>et al</i> 2017	452	La Digue census 368 Birds (294-441)
Bristol & Gamatis 2017		Denis Island census: 84 Birds
2018		In December 2018, 20 birds introduced to Curieuse Island from La Digue.

This population increase has been augmented by the introduction of 23 flycatchers from La Digue to Denis Island in 2008. 2017 census of the flycatcher population on Denis recorded 84 birds.

Bristol *et al* (2013) postulate that the natural population as across the 5 original islands would have been in the region of 2400 birds, this based on an extrapolation of territory size in plateau woodland. In light of the ongoing expansion of territories into hillside woodlands however, this may well be a significant underestimate. Regardless it is clear that the population has undergone a severe bottleneck in the last 200 years from a population of  $\geq 2400$  birds down to an estimated minimum 28 individuals restricted to La Digue in 1965. Bristol *et al* (2013) have shown through genetic analysis of museum specimens in comparison with contemporary specimens that the flycatcher population was historically genetically structured between the Praslin/Aride population and the La Digue population. Their analysis found that species level allelic diversity within the flycatcher was reduced by 20.3% with the extinction of flycatchers from Praslin and Aride. Genetic diversity was further degraded in the Denis Island population indicating that periodic transfers of birds from one population to another may be advisable for long-term management.





The reasons for the increase of flycatcher population despite decline in what was for a long time considered its key habitat of lowland forest is not entirely clear. However it would appear that woodland forest habitat has been steadily improving since the cessation of plantation agriculture on the mountainsides of La Digue in the 1970s (Bristol *et al* 2017).

In the first week of December 2018, 20 flycatchers were transferred from La Digue to Curieuse Island. This introduction was preceded and accompanied by population management measures for Black rats (*R. rattus*) and Indian mynah birds (*A. tristis*). The successful establishment of a third population on Curieuse Island, would facilitate the species down listing from critically endangered<sup>13</sup>.

#### Case Study 4: The Seychelles black parrot (*Coracopsis barklyi*) - status, trends and conservation.

(Nevill, J.E.G. 2018)

Formerly considered a subspecies of the Lesser vasa parrot (*Coracopsis nigra*), the Seychelles black parrot was recognised as a distinct species *Coracopsis barklyi* in 2014 (del Hoyo *et al* 2015) bringing the number of Seychelles endemic bird species to 13. This reclassification was brought about by evidence of its evolutionary and morphological distinctiveness (Jackson *et al* 2016) coupled with years of intensive research into its unique ecology and behaviour (Reuleaux, A 2011, Reuleaux *et al* 2013, 2014a, 2014b).

DNA analysis also indicated that the species has undergone a severe population bottleneck during the 20<sup>th</sup> century likely as a consequence of range contraction and habitat loss. Analysis of museum specimens dating back to 1878 in comparison with contemporary samples collected in the field indicated a serious impoverishment of genetic diversity within the population. The effective population size (i.e. the number of individuals which contribute offspring to the next generation) being calculated as 864 in 1878 compared to just 6 by 2011.

There have been several attempts, through the years, to estimate the population size and population trend of the Seychelles black parrot. These studies, which cannot be directly compared due to the differing

<sup>13</sup>Birds were recorded nest building on Curieuse within four weeks of translocation and the first flycatcher chick fledging on 6 February 2019. A further six birds were translocated from Denis Island to Curieuse Island in the last week of February 2019.

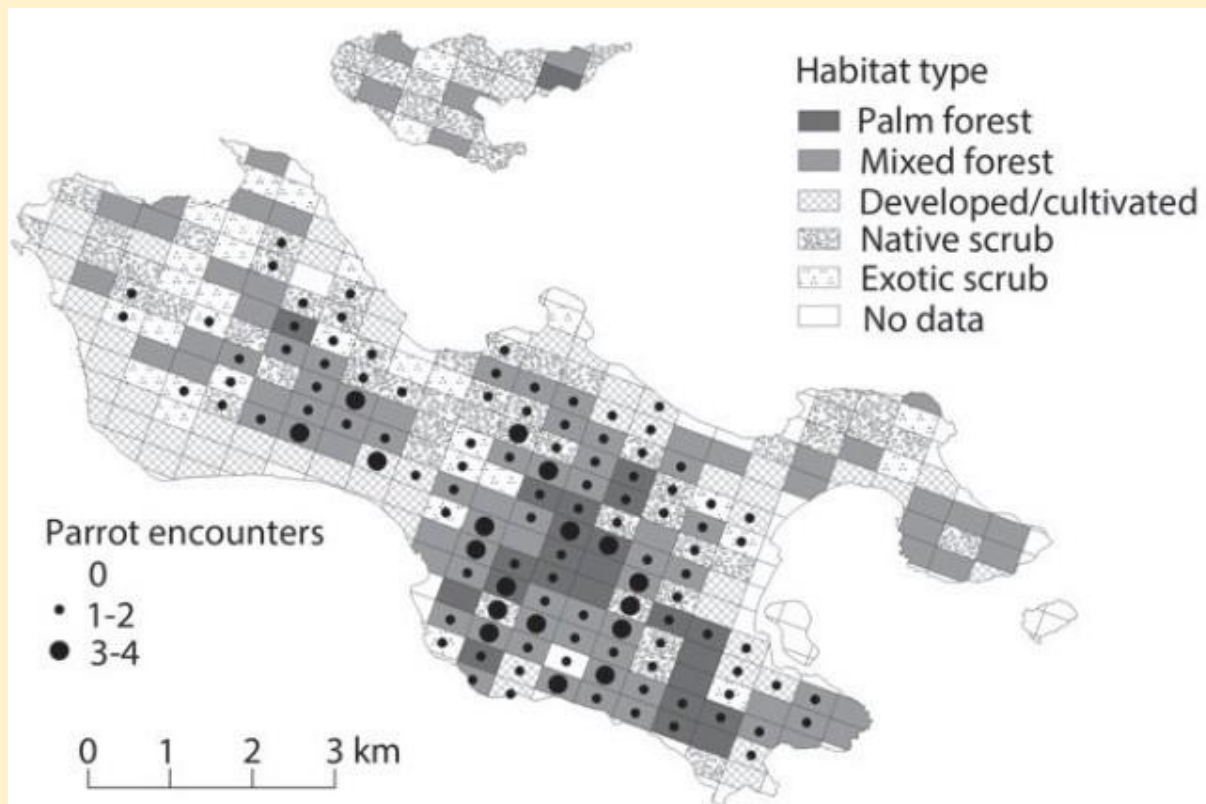
methodologies and respective shortcomings, do appear to indicate a clear trend of growth in the black parrot population through the latter half of the 20<sup>th</sup> century (see table below). Indeed the latest survey provides the highest minimum population figure yet of 1096 individuals, adult and juvenile (i.e. birds under three years of age).

Study	Population Estimate	Notes, criteria and limitations
Gaymer <i>et al</i> 1969	≤ 50 estimate 30-50	Reported population to be almost exclusively in and around the Vallee-de-Mai. <sup>14</sup>
Evans 1979	90 (± 20)	Using simultaneous counts, with 65% counted in the palm region of the Vallee-de-Mai. <sup>14</sup>
Merritt <i>et al</i> 1986	≥ 58	Used simultaneous counts focused on VdM
Laboudallon <i>et al</i> 1985-2005	Used simultaneous counts from 24 to 50 locations around Praslin. (Rocamora&Laboudallon 2009) summarised this work as follows: “An increase of approximately 40% of the abundant index (floating mean over three years of the average number of parrots on 24 point counts) has been recorded between 1985 and 1997. Reached a peak in 1999 trend uncertain since then due to fluctuations and missing counts during period 2005 to 2007.”	
Rocamora & Skerrett 2001	Estimated 200-300	
Walford 2008	645	
Rocamora & Laboudallon 2009	≥163 Estimate 200-300	Simultaneous counts around Praslin in 2008.
Reuleaux <i>et al</i> 2013	520-900 (95% Confidence Interval)	An extensive and structured survey was undertaken from December 2010 to March 2011 utilising 268 survey points 20 of which were located on Curieuse island set out methodically to enable use of Walford’s 2008 encounter rate method to generate a population density estimate (see map coverage and findings)
SIF 2018 Annual report	≥ 1096 Estimate 1100-1740	Utilised the same method as Reuleaux <i>et al</i> 2013 but was undertaken outside of the breeding season hence population growth should not be inferred from the 2010/2011 survey to the 2018 survey. Rather population assessment at this time of year can be considered to be more accurate and hence minimum population size is now considered to be 1096 birds (juveniles and adults)

<sup>14</sup>Watson (1984) considered this an under estimate because it neglected areas outside the VdM.



**Figure: Praslin (38Km<sup>2</sup>) and Curieuse (2.87Km<sup>2</sup>) Islands with Habitat Type and Parrot Encounters from the 2010-2011 Census Survey (From Reuleaux *et al* 2013)**



Reuleaux *et al* (2013) postulate that legal protection for the parrot in 1966 and all endemic palms which provide the favoured habitat, as well as the expansion of fruit tree plantations on prouling may have contributed to the population increase. It is also likely that the general expansion of forest cover on Praslin due to changes in land use from the early 20<sup>th</sup> century has played its part.

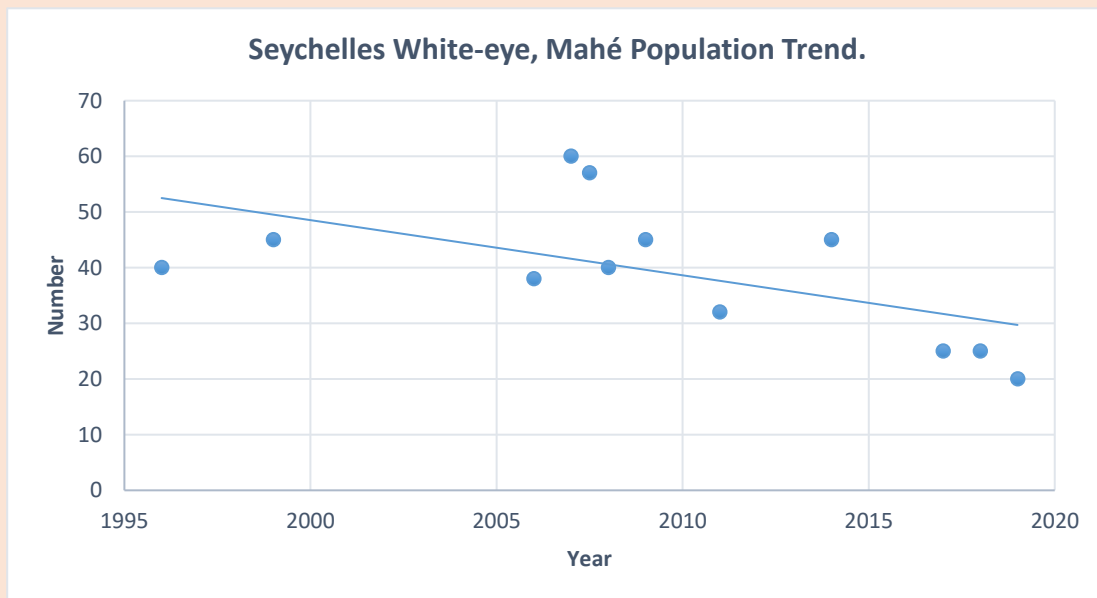
The Black parrot (*C. barklyi*) has been classified as Vulnerable (D1) on the IUCN red list as its population is small and restricted to the island of Praslin (38Km<sup>2</sup>) and it is therefore at risk from stochastic events and human impacts (IUCN 2016b). Its apparent genetic impoverishment (Jackson *et al* 2016) also contributes to its vulnerability. On the positive side the key immediate threat to the population, i.e. the presence of the invasive Ring-necked parakeet (*Psittacula krameri*) has recently been addressed (see **Case study 2**). Conservation priorities for the species have been identified as expansion of its palm forest habitat (Jackson *et al* 2016), further research of its ecology (Reuleaux *et al* 2013), and investigation of the scope for its introduction to other islands (Rocamora & Laboudallon 2009).

### Case Study 5: The Seychelles White-eye (*Zosterops modestus*) – status, trends and conservation.

(Nevill, J.E.G & Henriette, R. 2018)

The Seychelles white-eye is a small endemic passerine. Formerly widespread on Mahé, it was believed to have become extinct in the mid-20<sup>th</sup> Century until it was rediscovered in 1961 (Loustau-Lalanne 1962). The population was estimated at less than 100 individuals in the mid-1970s (Collar & Stuart 1985) and at 35–45 individuals restricted to a few small areas of central Mahé in 1996 (Rocamora 1997a). This downward trend in the Mahé population has continued to the present day (see **fig a** below). Fluctuations in counts 2005–2009 have been attributed to the positive impact of rat control measures and the subsequent dispersal of the population due to disturbance and habitat destruction (Rocamora & Henriette 2011).

**Figure a : Population counts and trend of Seychelles White-eye on Mahé**



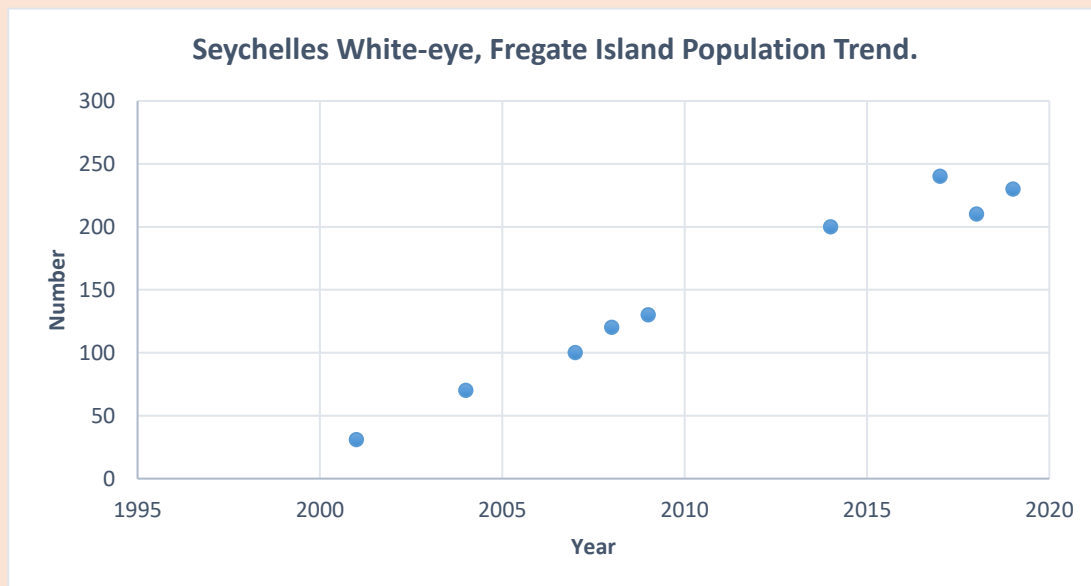
(Compiled from Rocamora 1997a, Rocamora & Henriette-Payet 2008, Rocamora & Henriette 2011, 2018, Henriette, E. pers comm 2019)

In 1997 the scenario changed dramatically when a new population was discovered on Conception, an uninhabited island off the northwest coast of the Mahé. The Conception population was estimated at 275 birds bringing the global population estimate to c.310 (Rocamora & Henriette 2011). Research on Mahé identified nest predation by invasive Black rats (*Rattus rattus*) as the main threat to species survival. Conception was notable because it did not have *Rattus rattus*, rather it had been colonised by the much less arboreal Brown rat (*Rattus norvegicus*). It seemed probable that having reached carrying capacity the Brown rat functioned as an effective barrier to colonisation of the small island (69 ha) by *R. rattus*. The discovery of the Conception population opened up new possibilities for the conservation of the species and in 1998 the Seychelles White-eye Recovery Programme (SWERP) was initiated by Seychelles Division of Environment with financial support from the Dutch Government. SWERP studied the species ecology and determined that the Mahé and Conception populations were genetically distinct, isolated from each other and that one was not a sub-sample of the other (Rocamora & Richardson 2003). Mahé White-eyes were on average significantly larger than Conception birds. The genetic differentiation, though not significant on a

taxonomic level, merited that both populations should be treated as important genetic sub-populations equally worthy of protection. Furthermore it was felt that the mixing of populations on an isolated island may be beneficial for the species in future projected translocations.

In 2001, 31 White-eyes were translocated<sup>15</sup> from Conception to Fregate island (219 ha)(Rocamora & Henriette-Payet 2008) an isolated rat and cat free island with some 60ha of suitable broad-leaved woodland habitat. In 2007, 25 birds were transferred from Conception to North Island (201 ha) and 23 birds (20 from Conception and 3 from Mahé) were introduced to Cousine Island (26ha). The Fregate and North island introductions both showed steady increase (See **Fig b & c**). The North island population plateaued in 2014-2015 but surged again following the control and eradication of Indian Myna birds (*Acridotheres tristis*) further highlighting the impact of this invasive species and the importance of its control (**See case study 1**).

**Fig b: Seychelles White-eye population growth on Fregate Island**

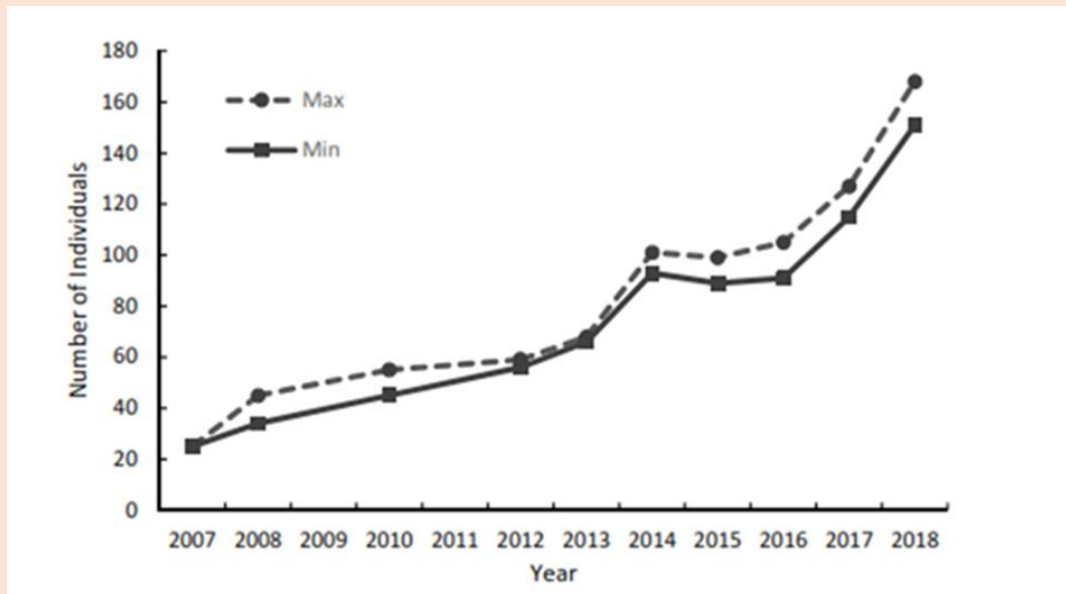


(Compiled from Rocamora & Henriette-Payet 2008, Rocamora & Henriette 2011, 2018, Henriette pers comm 2019)

The population decline in 2018 is due to the transfer of 30 birds to Grande Soeur Island.

**Fig c: Seychelles White-eye population growth on North Island (Pietersen 2018)**

<sup>15</sup> In 2003 a further 6 females were transferred from Conception to balance the population sex ratio.



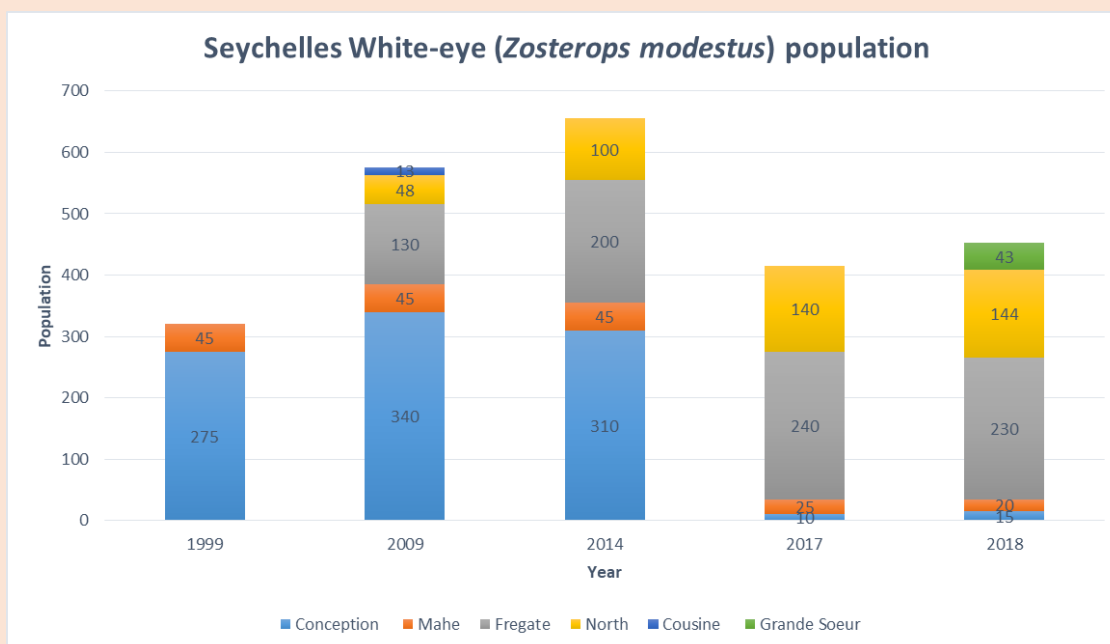
The Cousine Island introduction, the advisability of which was questioned in some quarters but ultimately approved by the authorities, failed likely due to overlapping niches/interaction<sup>16</sup> of other endemic insectivorous bird species that were already established on the very small (26 ha) island. 23 birds were introduced in 2007, by 2009 there were only 13 individuals on the island. A 2013 census found just 5 birds and none were recorded from 2014 onwards.

As a consequence of the discovery of the Conception population and establishment of a new population on Fregate the species was down listed from Critically Endangered to Endangered by IUCN in 2005. In 2007 the decision was taken to eradicate brown rats from Conception Island (**see info box III**), this resulted in a jump in the population from 275 in 2005 to 340 in 2009 (**Rocamora & Henriette 2011**). This coupled with the growing populations on Fregate and North Islands saw the species further downgraded by IUCN from Endangered (EN) to Vulnerable (VU) in 2016. During this same period however disaster struck!

In 2017 it was discovered that Black rats (*Rattus rattus*) had colonised the species' main stronghold, Conception Island probably in 2015, and the population on the island had declined from c.340 individuals in 2009 and c.310 individuals in 2014 to around 15 individuals (**Birdlife 2019b**). This was equivalent to an approximate loss of 45% of the global population as well as the loss of the key genetic founder **population** (**see Fig d**).

<sup>16</sup> This is included the unforeseen harassment and killing of juvenile White-eyes by Seychelles magpie-robins.

Fig d: Seychelles White-eye population 1999-2018



(Compiled from Rocamora & Henriette 2011, 2018; Henriette pers comm 2019)

The species IUCN RedList status was reviewed in May 2019, following the catastrophe on Conception, and ultimately it was decided that the status should remain as Vulnerable (VU) because the Conception population reduction was considered a one-off event and the overall population is expected to increase over time due to the Fregate and North Island populations (BirdLife 2019b).

The situation regarding the genetic health of the populations is less clear and requires further investigation, with the source Conception population all but extirpated and the distinct Mahé population in seemingly terminal decline (see Fig a) the growing populations on Fregate and North are sub-populations of a, now near-extirpated, sub-population. Research on the Seychelles warbler (Spurgen *et al* 2014), Seychelles paradise flycatcher (Bristol *et al* 2017) and Black parrot (Jackson *et al* 2016) have shown that population bottle necks have had distinct impact on species genetic diversity and it would seem likely the same will be true for the Seychelles white-eye and this heightens the importance of trying to salvage the remnant Mahé and Conception populations, if at all feasible, representing as they do the species genetic base. In July to September 2018, a new population was established on the island of Grande Soeur. 47 birds in total were translocated 30 from Fregate and 17 from North Island. Successful breeding has subsequently been recorded on the island.

Seychelles has made significant and continuing progress in the conservation of its endemic palms including the Coco-de-mer (*Lodoicea maldivica*) (IUCN EN) which was reported on in detail in Seychelles 4<sup>th</sup> national report to the CBD.

Seychelles boasts a protected and apparently growing population of the Dugong (*Dugong dugon*) (IUCN VU) at Aldabra atoll.

Seychelles has also realised significant success in the conservation of marine turtles, this largely due to the outstanding recovery of rookeries in two key protected area the Green Turtle (*Chelonia mydas*) (IUCN EN) at

Aldabra Atoll (Special Reserve and World Heritage Site) and the Hawksbill turtle (*Eretmochelys imbricata*)(IUCN CR) at Cousin Island Special Reserve. These turtle populations were reported on in detail, in Seychelles 4th National Report and so it will not be repeated here except to note that the positive trends continue. It is also known that nesting populations are showing increase on some privately owned islands which operate as luxury nature tourism resorts namely: Cousine, Denis, Fregate and North islands in the central archipelago. In the outer islands there are also preliminary suggestions of positive trends with recent as yet unpublished survey work indicating that nesting populations may be showing signs of gradual increase (J. Mortimer *pers comm*). This is presumed to reflect a decrease in poaching activity in recent years.

On the populated islands however the available information presents another scenario. The MCSS Mahé southern beaches report 2017-2018 states for Hawksbill turtles (*Eretmochelys imbricata*) (IUCN CR) “Both the number of emergences and the number of nests have drastically dropped compared to the [recent] previous seasons.” While for Green turtles (*Chelonia mydas*)(IUCN EN): “Compared to the last season, the number of Green turtle emergences and recorded nests has decreased.” The report goes on further to state that poaching, human disturbance and that of dogs remain pressing issues (Didon 2018).

For marine megafauna Seychelles has a proud history of legislative action. Seychelles was the lead country in the designation of the Indian Ocean Whale Sanctuary in 1979 and all marine mammals have full protection under Seychelles law (GoS 1986). Marine turtles have received full protection since 1994 (GoS 1994a) though their habitat, critically nesting habitat, is not protected. The Whale shark (*Rhincodon typus*) has received full protection since 2003 (GoS 2003). Enforcement though is another matter, consumption of dolphin and turtle meat for example remains widespread. Seychelles is also far behind its international obligations with regard to threatened species and its compliance to the requirements of the Convention on Migratory Species and CITES (See **Section II 1.1**).

Furthermore numerous Threatened marine species (IUCN red List criteria – Categories CR, EN and VU) receive no protection. A 2017-2018 survey of the artisanal catch by the Green Islands Foundation (funded by GEF-Satoyama and SeyCCAT respectively) recorded 23 threatened species being legally caught and landed (GIF 2019). A longer term artisanal survey 2013-2018 has recorded 25 threatened species caught legally in the artisanal catch (Nevill 2018a).

#### **Relevant websites, web links and files**

Endemic Bird Species (Nature Seychelles). <http://www.natureseychelles.org/knowledge-centre/seychelles-wildlife-2/endemic-bird-species>

Seychelles Magpie Robin recovery Team (SMART). <http://www.natureseychelles.org/what-we-do/54-what-we-do/conservation-networks/80-smart-seychelles-magpie-robin-recovery-team>

Seychelles Biodiversity Clearing House Mechanism. <http://www.seychellesbiodiversitychm.sc>

GIF Threatened species project. <http://gef-satoyama.net/subgrantprojects/gif/>

Dugong reports. <https://www.cms.int/dugong/en/country/seychelles>

Seychelles Seatizens website. [www.seatizens.sc](http://www.seatizens.sc)

**Obstacles and scientific and technical needs related to the measure taken:**

In the terrestrial domain the key obstacles are resources (financial and personnel) and technical capacity to address IAS issues in the key centre for endemic biodiversity that is 200-500m asl on the islands of Mahé and Silhouette.

In the marine scenario the huge area of the Seychelles EEZ clearly exceeds national capacity for effective monitoring and law enforcement. It also appears however that law enforcement at landing sites and points of sale is not pursued which indicates a lack of will (political and institutional) in addition to capacity limitations.

**Relevant websites, web links and files**

N/A

**1.8 Ecosystem Rehabilitation**

**For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes**

Target 5. By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

**Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:**

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective (**Terrestrial Ecosystems**)
- ☒ Measure taken has been ineffective (**Marine Ecosystems**)
- ☐ Unknown

**Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above**

Terrestrial Ecosystems. Seychelles has made significant progress in the rehabilitation of terrestrial ecosystems and their services whether that be percentage forest cover and the soil and water cycles on the principal granitic islands or broader small island ecosystem rehabilitation and/or restoration. Whilst there remain key issues to be addressed. Progress has been such that national stakeholder workshop

consultations determined that Seychelles was on track to achieve ABT 5 in the terrestrial domain (see below for additional information).

Marine Ecosystems. The marine scenario in Seychelles is very different and being driven by two key factors.

i). climate change induced raised sea temperatures driving coral bleaching and degradation of Seychelles coral reef ecosystems; ii). Overfishing driving ecosystem and ecosystem service degradation and reducing marine ecosystem resilience to climate change. Previous reports (**GoS 2011, 2014a, Nevill *et al* 2015**) have covered coral bleaching events and further information is provided in **Sections II 1.3** and **Section VII xx** (status and trends including maps of known coral reef areas) of this document and in additional information below.

#### **Relevant websites, web links and files**

N/A

See references section appended to this report

#### **Other relevant information.**

##### Terrestrial Ecosystems.

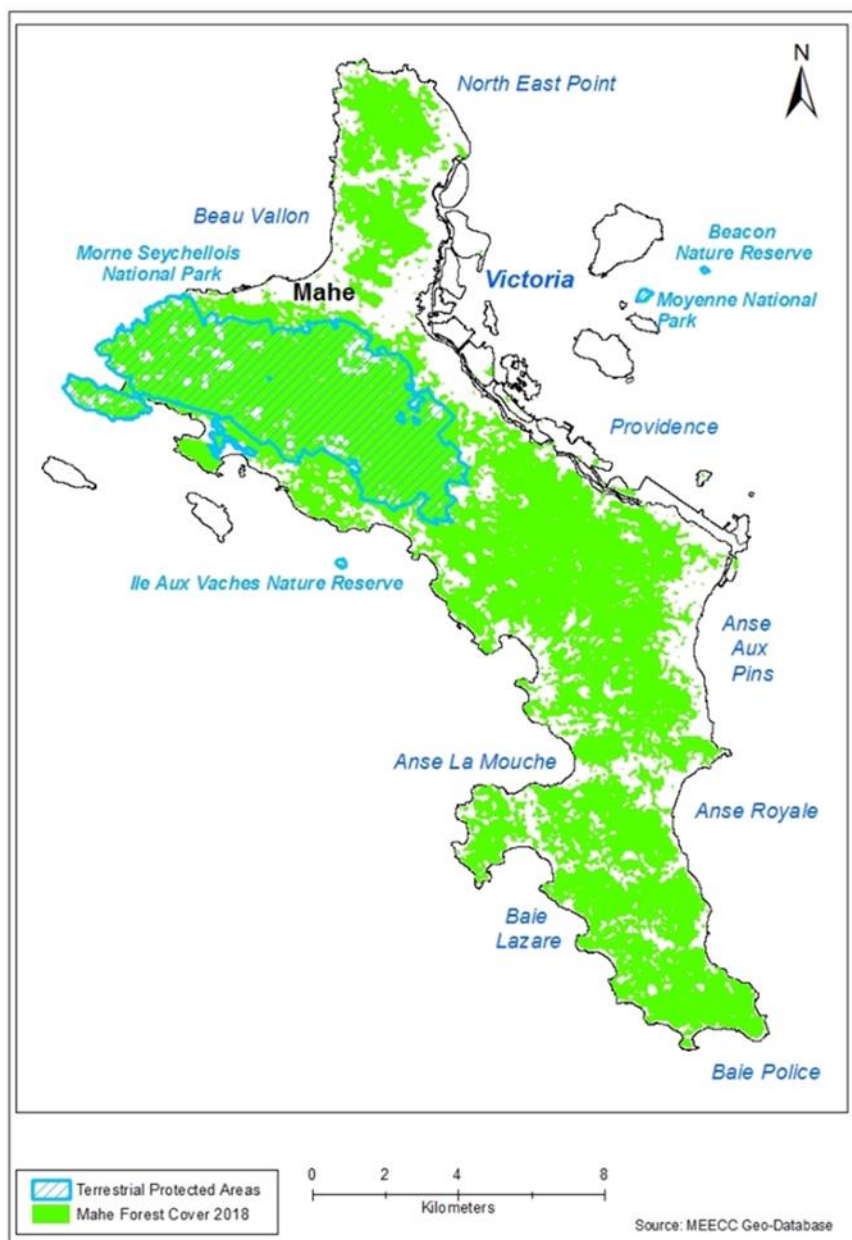
Seychelles has a very small land area of approximately 452 km<sup>2</sup> and at least 65% of it has undergone wholesale anthropogenic change such as forest clearance and/or drainage during the last 250 years and the vast majority of it has experienced secondary impacts such as moderate to severe modification and the incursion of Invasive Alien Species (IAS).

##### Forests

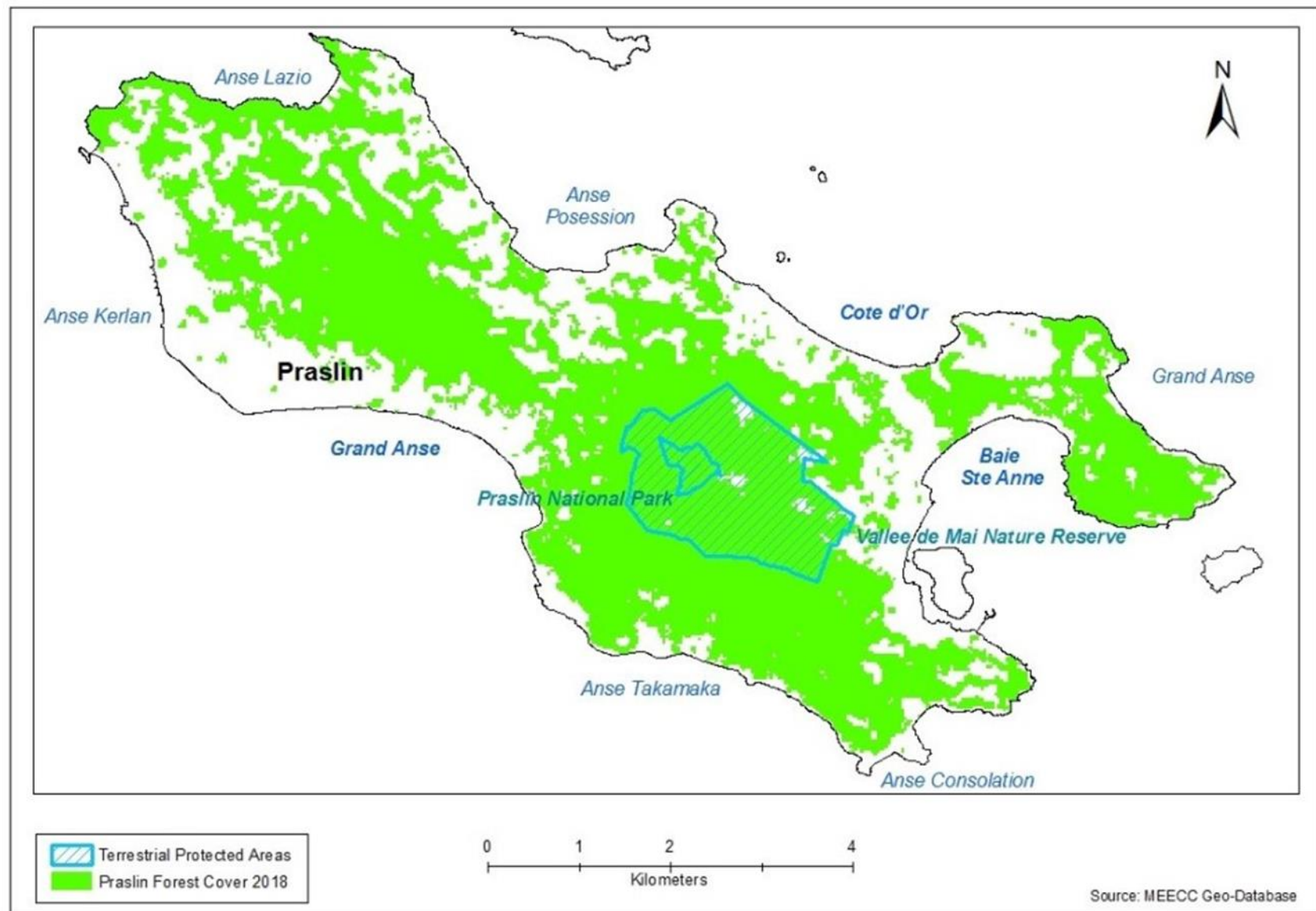
Protective measures and the country's marked economic transition from an agrarian to a services and fisheries based economy, from the mid-20<sup>th</sup> century onwards, saw land use and the pressures on land change significantly. Consequently secondary forest habitat has re-covered on most of the islands of the central archipelago and the extensive coconut plantations of the coralline islands have fallen in to disuse. Forest cover has increased dramatically in the central archipelago over the last century and, though generally secondary and extensively infiltrated by IAS, ecosystem services and many native species have benefited accordingly. **Maps 5-8** show the 2018 status of forest cover and terrestrial protected area coverage on the four main islands of the central archipelago: Mahé, Praslin, Silhouette and La Digue.



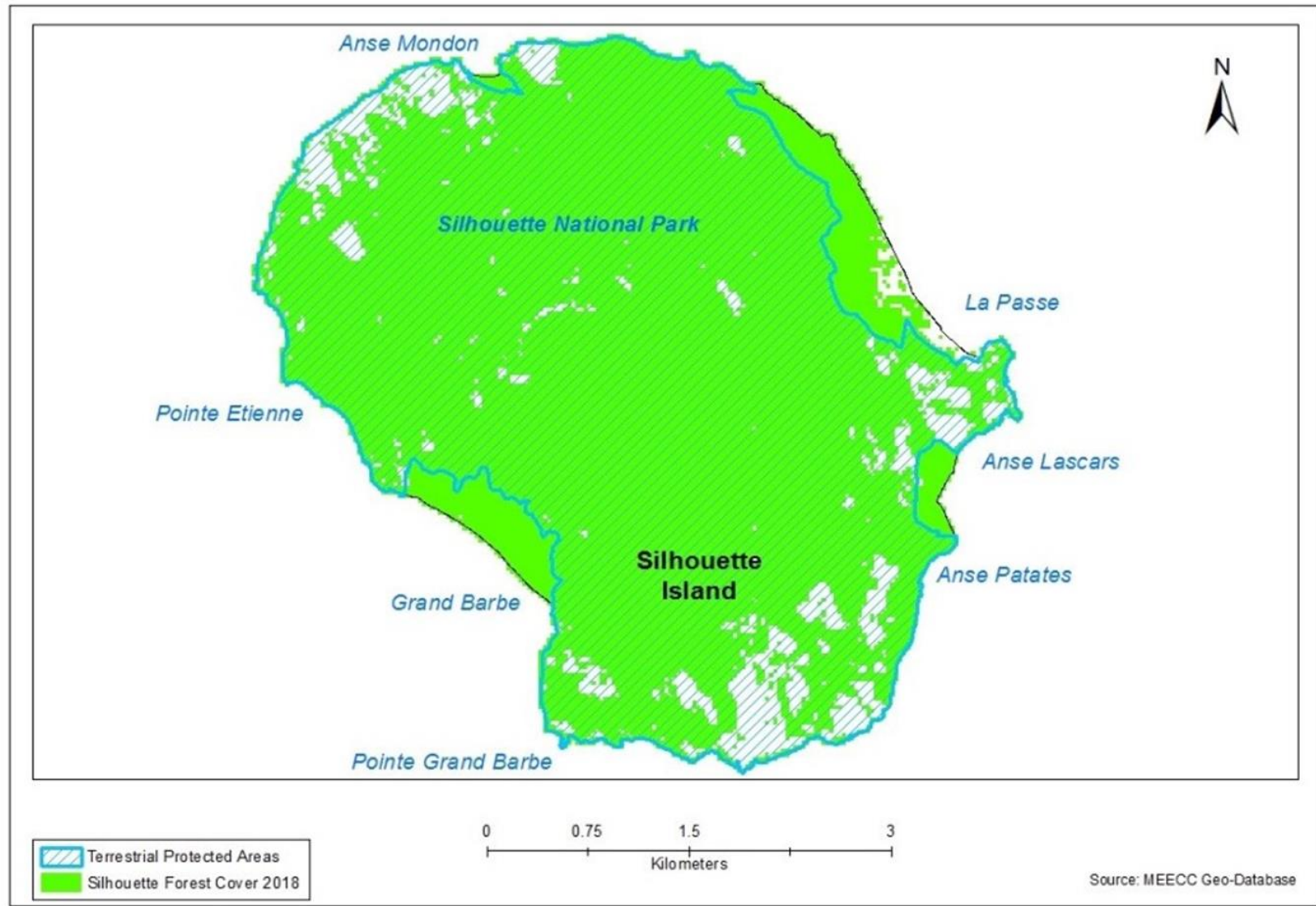
**Map 5. Forest Cover and Protected Area Coverage on Mahé Island (MEECC Geo-Database)**



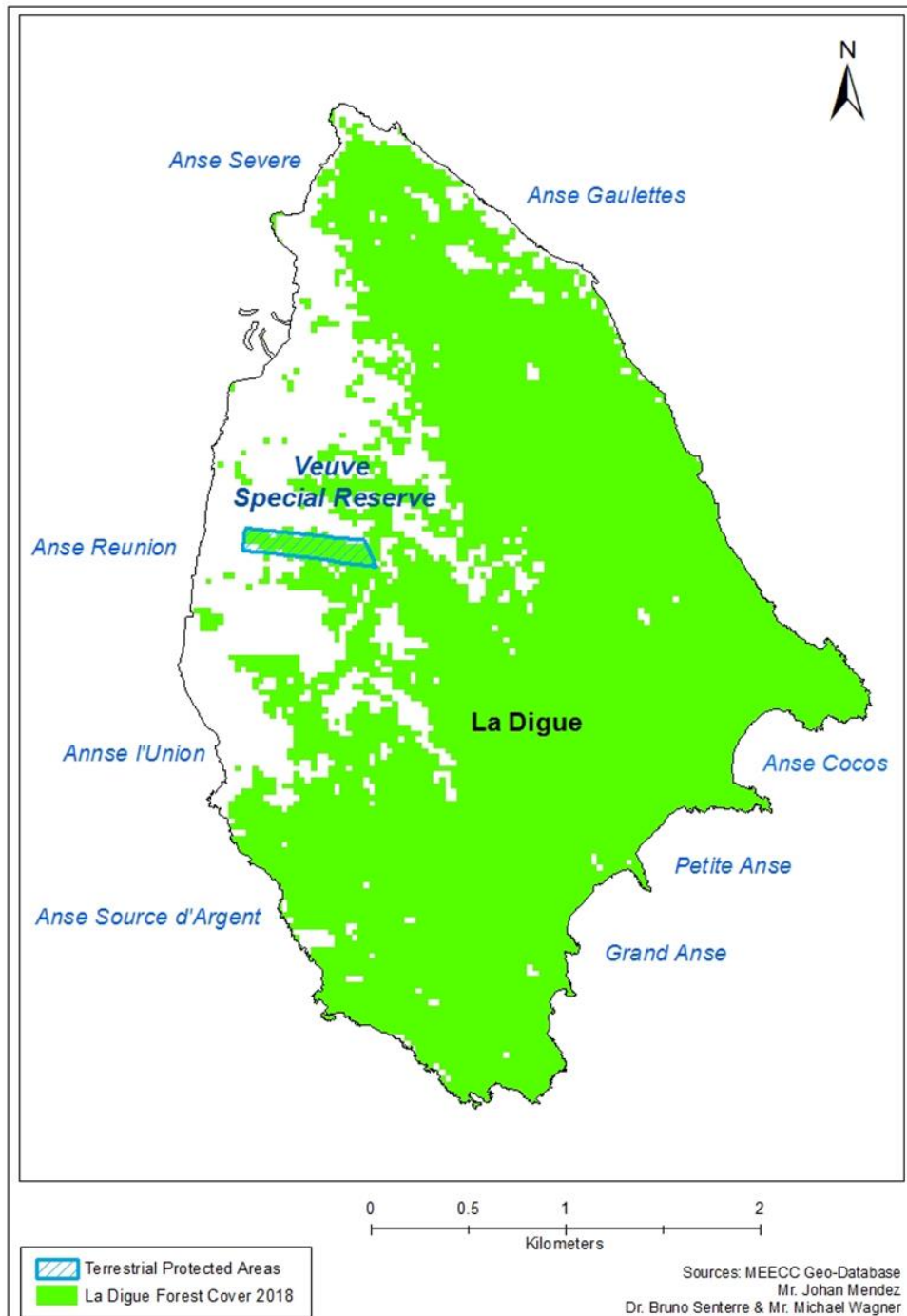
Map 6. Forest Cover and Protected Area Coverage on Praslin Island (MEECC Geo-Database)



Map 7. Forest Cover and Protected Area Coverage on Silhouette Island (MEECC Geo-Database)



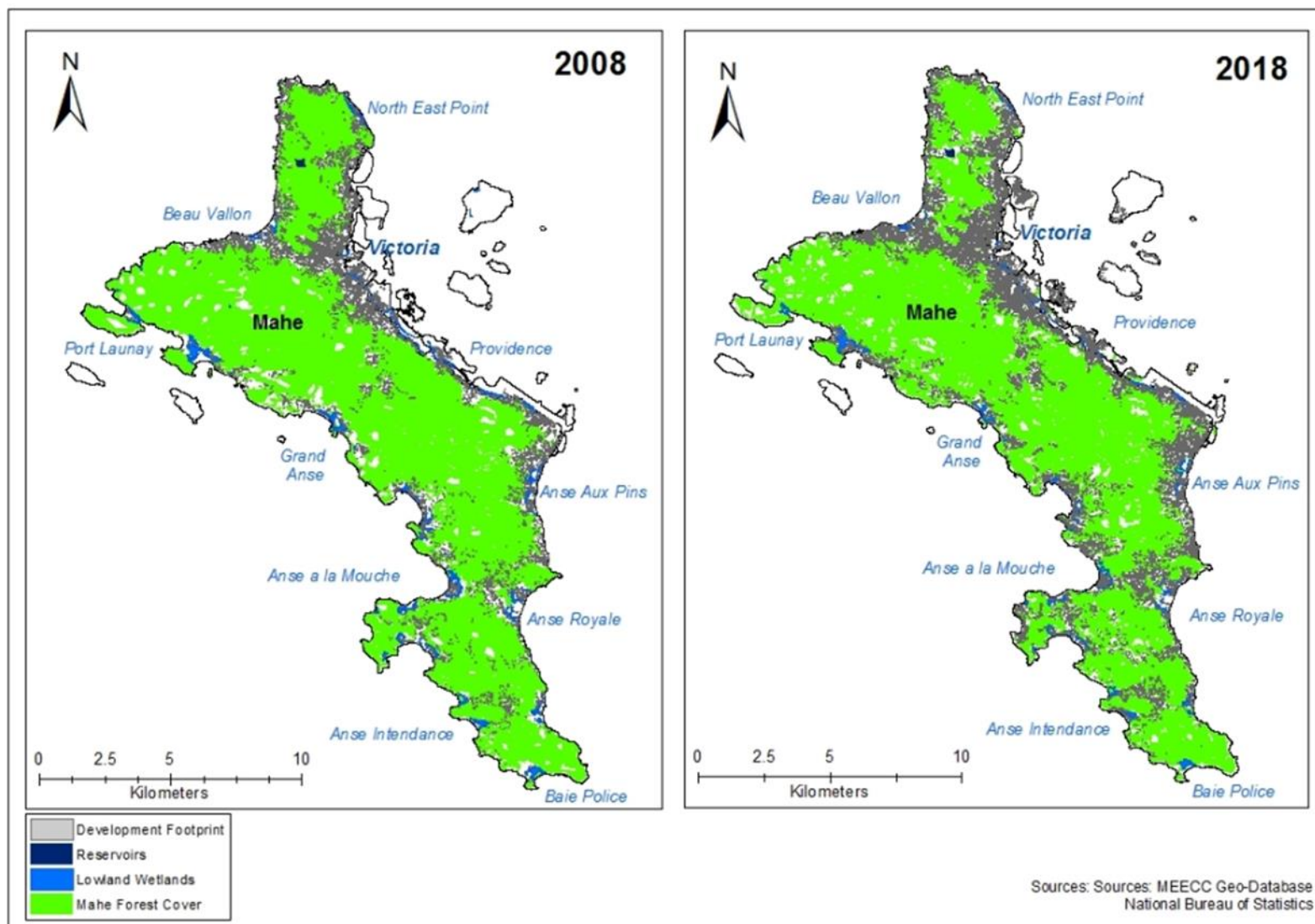
Map 8. Forest Cover and Protected Area Coverage on La Digue Island (MEECC Geo-Database)



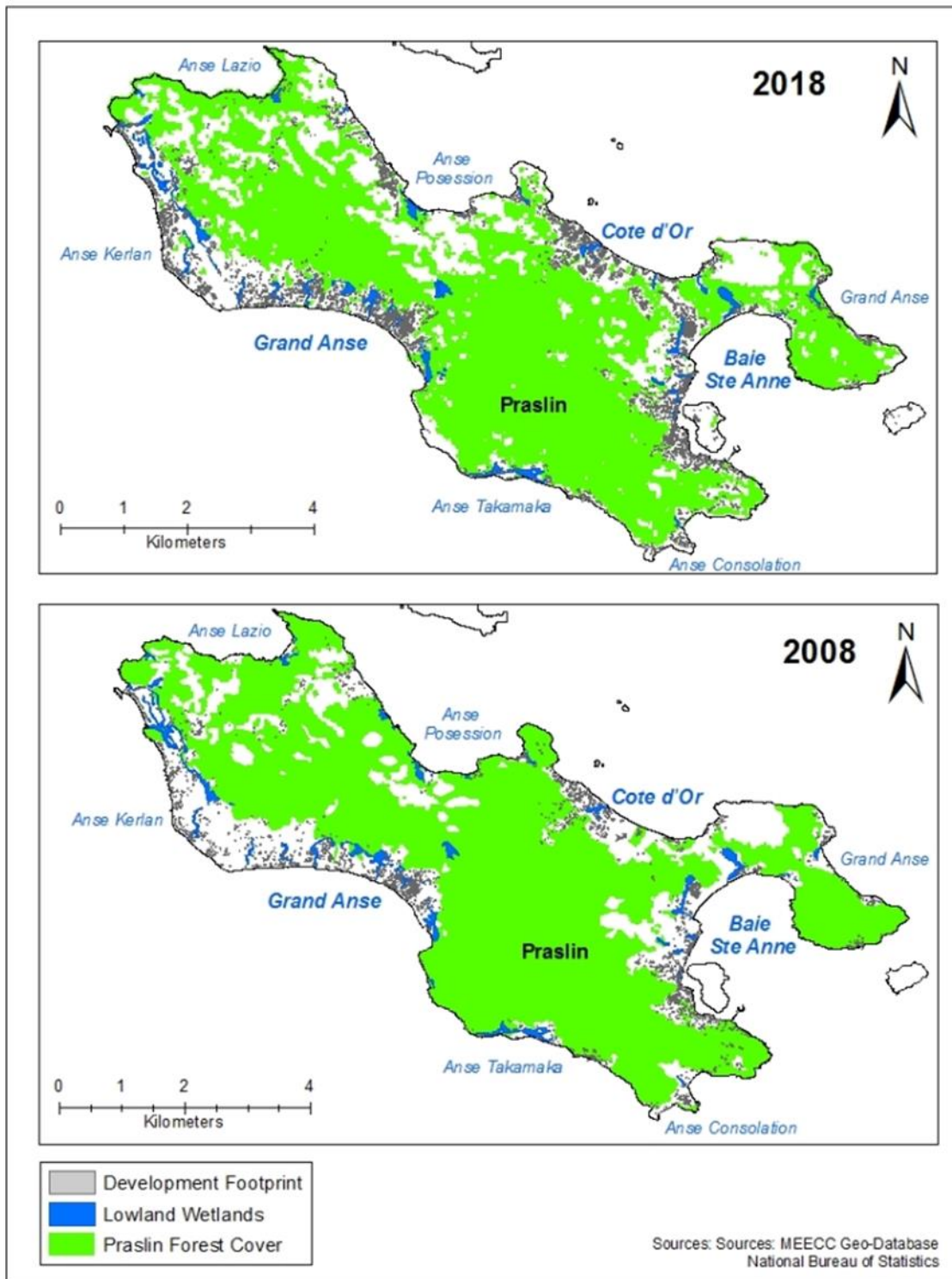
The current forest coverage of the granitic islands of Seychelles is 70.88% (MEECC GIS Unit). To give some indication of the terrestrial development pressure, **maps 9-11** show the physical development of the three main populated islands, their lowland forest coverage, and its change from 2008 to 2018.



Map 9. Mahe Island Development Footprint 2008 and 2018 (MEECC Geo-Database)



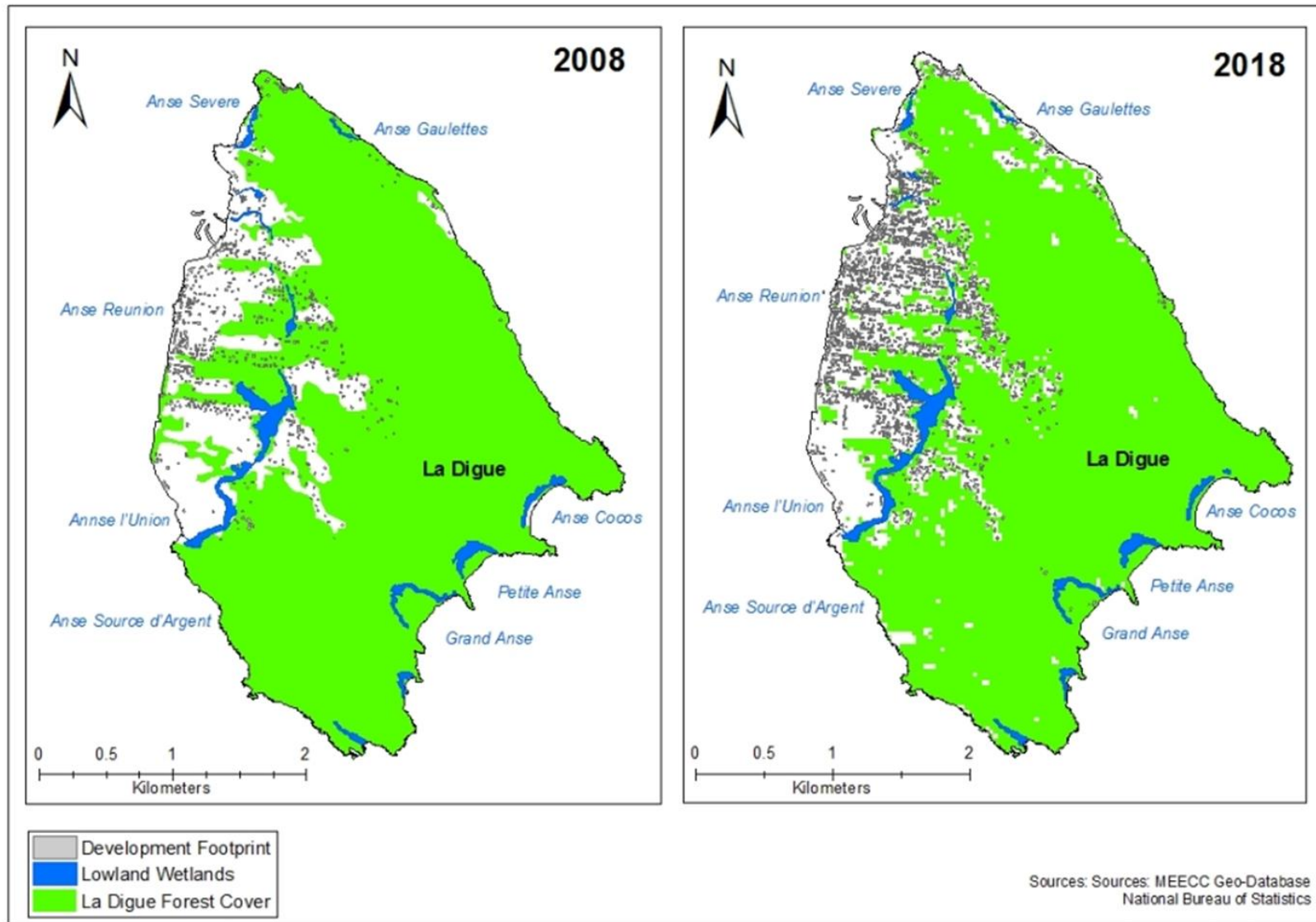
**Map 10. Praslin Island Development Footprint 2008 and 2018 (MEECC Geo-Database)**







Map 11. La Digue Island Development Footprint 2008 and 2018 (MEECC Geo-Database)



**Other relevant information (cont).**

The topography of the populated islands means the primary land use pressure applies to the coastal plateaus which are thus subject to the classic SIDS scenario of “coastal squeeze” with all main land use and economic activities competing for space in these narrow coastal strips.

The most threatened habitat types have therefore been previously identified as occurring in this area i.e. lowland wetlands, coastal/lowland forests and beach crest and beach habitats.

Likewise there is currently no qualitative analysis or data available to assess the ecological value to native species of the secondary forest habitat that dominates in the peak zone for endemic terrestrial biodiversity between elevation of 200 and 500m on the main granitic islands and the trends in terms of endemic biodiversity and the incursion and impact of IAS.

Lowland forest rehabilitation has been a focus on several of the smaller islands in the central archipelago, typically as a component of ecosystem rehabilitation along with the eradication of IAS (see **Section II 1.6 Fig 12**) and the subsequent introduction of threatened endemic species.

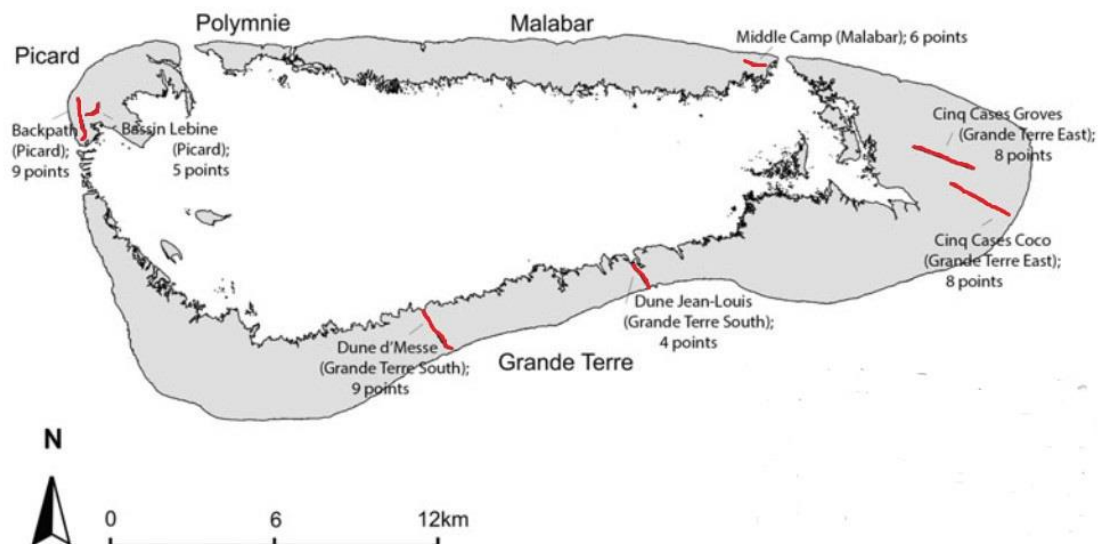
<b>Approximate Area of Lowland Woodland Rehabilitated on Smaller Granitic Islands.</b>				
Island	Total Area (Ha)	Woodland Area (Ha)*		IAS Status
		Re-planted	Recovered	
Aride	68	7	50	Rat & Cat Free
Bird	94	1	35	Rat & Cat Free
Conception	60	2	1	<i>Rattus rattus</i>
Cousin	29		27	Rat & Cat Free
Cousine	26	10	14	Rat & Cat Free
Curieuse	286	20		<i>Rattus rattus</i>
Denis	143	35	4	Rat & Cat Free
Felicite	268	40		<i>Rattus rattus</i>
Fregate	207	60		Rat & Cat Free
North	201	50		Rat & Cat Free
		225	131	
<b>Total</b>	<b>1,382</b>	<b>Ca. 356</b>		

Percentage Rehabilitated	Ca 25%	
*: Woodland Areas adapted from <b>Rocamora 2019</b>		

Forest rehabilitation has also been championed in the main granitic islands by the NGO Terrestrial Restoration Action Society of Seychelles (TRASS) a grassroots community and volunteer based agency committed to the restoration of degraded terrestrial sites in the Seychelles, which has been involved in restoration of habitat of some 45 ha on the island of Praslin alone (**Rocamora 2019**). This work has addressed erosion prevention and catchment rehabilitation utilising indigenous vegetation.

In the outer islands there are good but largely unquantified indications of natural forest and/or scrub recovery following the cessation of intensive agriculture in the islands and in particular the collapse of the coconut oil industry in the 1980s. There is some good substantive evidence however about recent trends in the habitats of Aldabra atoll. Aldabra is an isolated large raised coral atoll which at an area of 152.6 Km<sup>2</sup> constitutes more than one third of the country's terrestrial surface area. Aldabra has a mosaic of habitats including coastal scrub, mixed scrub, dense patches of *Pemphis acidula*, open savanna like areas of grassy turf, beach and dune systems, limestone rock and mangroves. Van de Cromenacker *et al* (**2016**) investigated the population indices of 7 land bird species on Aldabra using an 11 year dataset. The data was derived from a species survey of 7 monthly transects from 2002-2013 on the islands of Grande Terre, Malabar and Picard (see **Map 12**) The counting points along each transect were assigned one of four main vegetation types.

**Map 12: Sites of the 7 Landbird Monitoring Transects on Aldabra**



Adapted from Van de Cromenacker *et al* 2016

The results showed that there was an overall increase in land bird abundance from 2002 to 2013, with only one species showing no increase, but rather staying stable. The population increases of land birds from 2002 to 2013, most marked in White-eyes (*Zosterops maderaspatanus aldabrensis*) at approximately 100%, Blue pigeons (*Alectroenas sganzini minor*) approximately 95%, Turtledoves (*Streptopelia picturata coppingeri*) approximately 90% and Aldabra fodies (*Foudia aldabrana*) approximately 83%, are believed to be due to vegetation changes over time. One major change over and before this period which has affected the vegetation is the eradication of feral goats. The long presence of goats on Aldabra, followed by their gradual reduction and ultimate elimination from the ecosystem, impacted the vegetation on the atoll and could explain the suppression and subsequent recovery of land bird populations. The terrestrial ecosystem of Aldabra can be inferred to be on a positive trend in light of this information.

#### Inland Waters

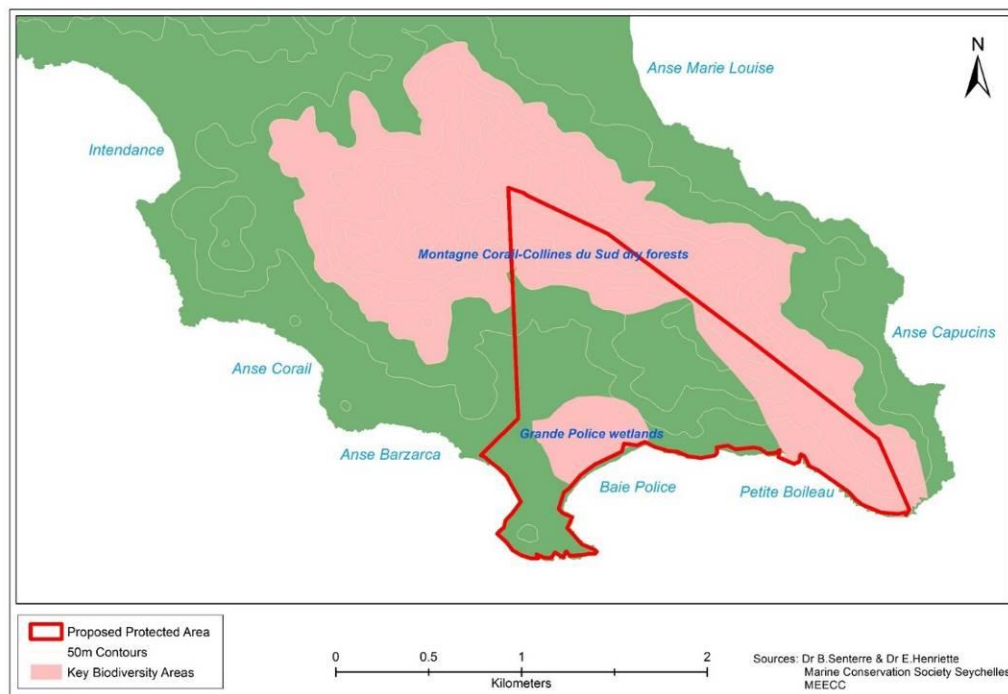
Lowland wetlands are considered the most threatened habitat type in Seychelles (Nevill *et al* 2015) with it being reported that more than 90% have been lost since 1770 and much of the remainder seriously degraded as land was drained and filled in for agriculture and construction. A lot of work has been undertaken during the reporting period on inland wetlands under the auspices of three distinct Ecosystem Based Adaptation (EBA) projects. This has included the ongoing development of a new National Wetlands Policy, management of lowland wetlands by removal of IAS and to enhance their flood mitigation capacity. Significant work has also been undertaken nationally on catchment restoration during the reporting period, including work by the NGO TRASS on the second island of Praslin. The UNDP EBA project also undertook in particular the mapping of previously undescribed upland wetland areas, this includes a marsh on Montagne

Planeau (upper Caiman River) which is currently unprotected and several recently mapped on Praslin including Glacis Noir which is in the Praslin National Park – unfortunately maps were not ready in time for inclusion in this report. Three highland wetland sites are well known: Mare aux Cochons on Mahé, La Plaine Hollandaise on Praslin and the Mare Aux Cochons on Silhouette.

All three sites were historically subject to extensive agricultural use and related species introduction but such activities have long since ceased. Rehabilitation work has been undertaken at the Mahé Mare aux Cochons site which lies within the Morne Seychellois National Park and was designated a Ramsar site in 2010. The Silhouette site, also called Mare aux Cochons, lies within the Silhouette National Park (declared in 2010). The third highland wetland is La Plaine Hollandaise on Praslin Island, this area is currently unprotected by national legislation, though it has been earmarked for designation.

One very significant advancement in the national wetland scenario has been the decision to set aside the Grande Police wetland and related watershed, in the South of Mahe, for subsequent designation as a Protected area. Grande Police the last intact mountaintop to coastline freshwater ecosystem in the country. This wetland had been threatened by a proposed hotel, golf course and marina development. This engendered significant public objection and protest that ultimately resulted in the Government of Seychelles announcing its plans to designate the area (see **Map 13** below).

**Map 13: Boundary Demarcation for Proposed Grande Police National Park**



## Marine Ecosystems

Coral Reefs. Previous reports (GoS 2011, 2014a, Nevill *et al* 2015) have covered coral bleaching events and further information is provided in **Sections II 1.3 and Section VII , 2** (status and trends of marine biodiversity- **see maps 29 and 30**) of this document. Another serious bleaching event took place in 2016, the data for which is not currently available in a processed form.

Seagrass. Maps of seagrass beds are included in **Section VII, 2** (status and trends of marine biodiversity).(See also **maps 24-28**)

Mangroves. Mangrove coverage has been relatively stable except for the small and ongoing expansion in the East Coast lagoons of Mahé.

The Seychelles Islands Foundation (SIF) recently published detailed maps of the lagoon of Aldabra Atoll.

The Atoll lagoon was mapped using satellite remote sensing techniques in conjunction with detailed in situ ground-referencing to create large-scale high resolution habitat and bathymetry maps of this important protected area. Eight habitat types were identified in the lagoon (see **Map 14**). The two dominant classes mapped were “sparse macroalgae and seagrass assemblage on sand” and “dense macroalgal mat on sand”, which covered 35% and 33% of the lagoon area respectively. Aside from algae and seagrasses, other notable habitat classes were bare carbonate sand (17% of the lagoon area) and, around the periphery of the lagoon in association with fringing mangroves, finer sand with organic matter. The remaining classes of coral, coral rubble, bedrock and seagrass beds occurred in the vicinity of the channels, particularly the northern channels of Grande Passe in the west and Passe Houareau in the east.

Estimates of lagoon floor elevation in relation to mean sea level ranged from -0.2 to -30 m (see **Map 15**). The deepest areas were associated with the channels, particularly Grande Passe in the northwest. Here, the channel subdivided into two main veins running into the lagoon centre to create a deeper basin (6–8 m deep) on the western side of the lagoon. Much of the lagoon in the east and around the rest of the periphery was shallow (<3 m). The shallowest areas of the lagoon were along the shorelines marking the inner margin of the southern lagoon boundary.

These maps represent a detailed record of the contemporary lagoon character against which future change can be monitored.

## **Relevant websites, web links and files**

N/A

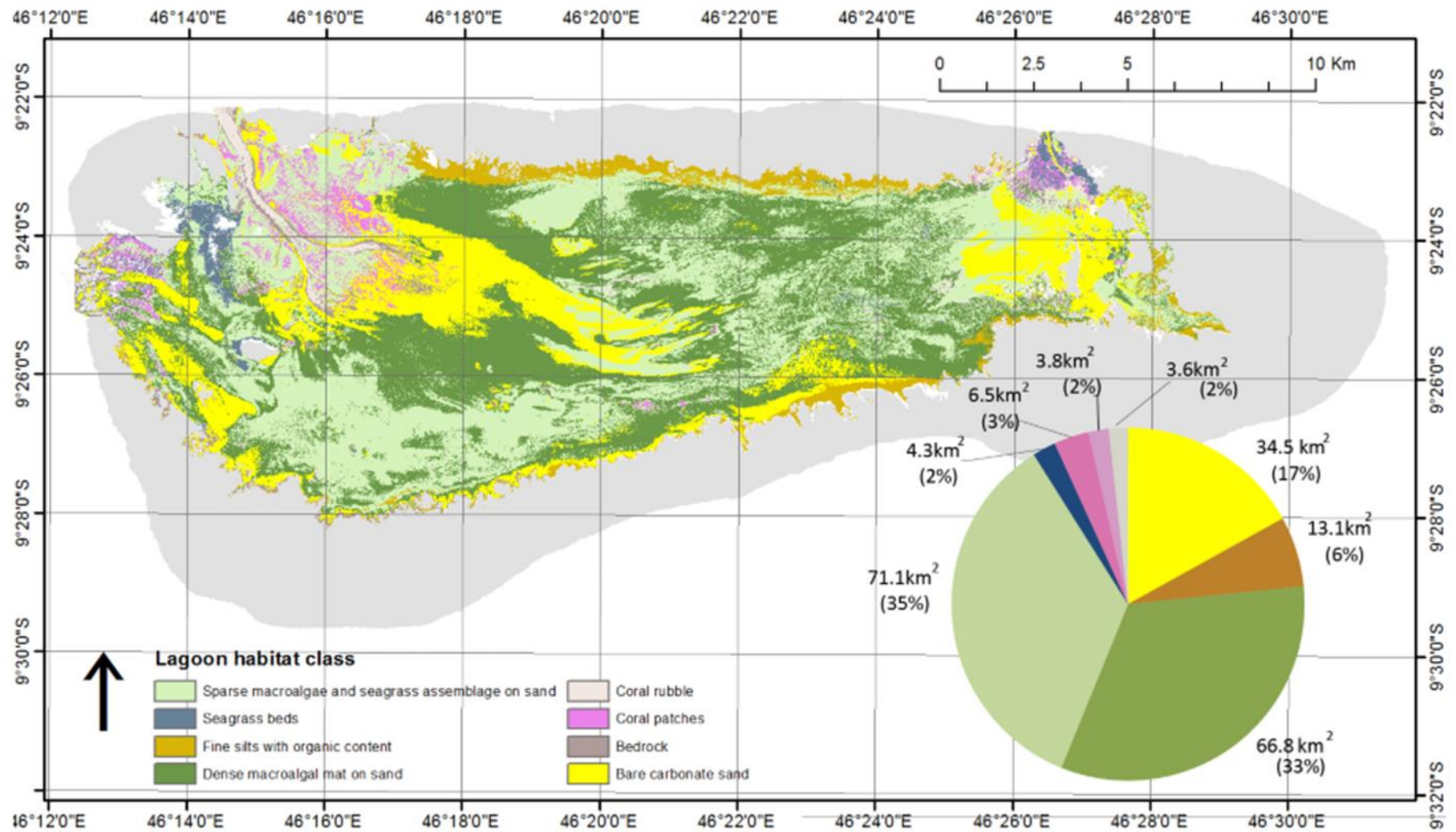
**Obstacles and scientific and technical needs related to the measure taken:** Please describe what obstacles have been encountered and any scientific and technical needs for addressing these, including technical and scientific cooperation, capacity development activities or the need for guidance materials.

The primary obstacles faced are the high demand for the very limited land available and the ongoing incursion and impact of invasive alien species on terrestrial ecosystems. In many cases techniques do not yet exist to address the divers' problems of IAS control and eradication.

**Relevant websites, web links and files**

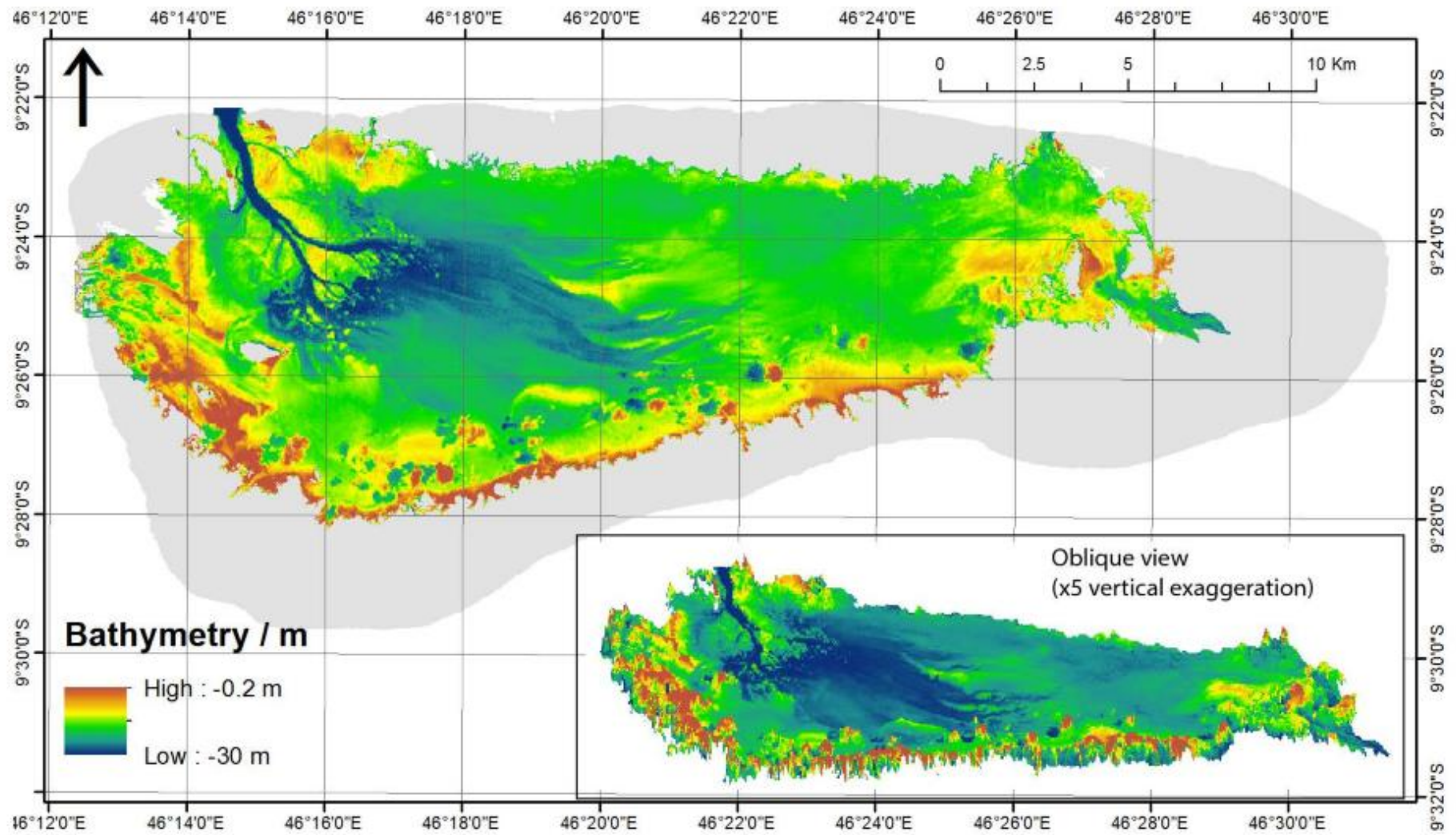
N/A

**Map 14: Habitat map of Aldabra Lagoon Showing 8 Classifications Categories with Indicative Proportional Coverage (Hamylton *et al* 2018)**





Map 15: Bathymetric map of the Aldabra Lagoon Floor from above and at an oblique angle (inset). (Hamylton *et al* 2018).



### 1.9 Financing and Innovative Financing

**For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes**

This measure addresses Aichi Biodiversity Target 20, with certain cross cutting contributions to several others (ABT 2, 3, 4)

**Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:**

- ☐ Measure taken has been effective
- ☒ Measure taken has been partially effective
- ☐ Measure taken has been ineffective
- ☐ Unknown

**Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above**

At the time of reporting, Seychelles is part of a Global UNDP Biodiversity Finance Initiative (BIOFIN) Project. Using the BIOFIN Methodology Seychelles undertook a Policy and Institutional Review, Biodiversity Expenditure Review and a Financial Needs Assessment focussed on the Costing of the NBSAP 2015-2020. From this project, Seychelles developed its Biodiversity Finance Plan that provides finance solutions across the main economical sectors of Tourism, Fisheries, and Biosecurity. The BIOFIN methodology was also used as the financial reporting framework for CBD.

Moreover through one of its ongoing Global Environment Facility (GEF\_UNDP) Project- Protected Area Financing, Seychelles was able, for the first time in 2015, to undertake a Baseline assessment of the Management Effectiveness of the Protected Area Network through a GEF METT scoring tool. From this project, also Seychelles was able to help the Protected Area Managers to assess their current income sources and identify new opportunities. Business plans were developed for the Persons Managing these protected areas.

At the time of reporting Seychelles had negotiated for a debt for nature swap facilitated by The Nature Conservancy. One of the main products of this Debt swap was the formulation of the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT)

**Relevant websites, web links and files**

**BIOFIN:** <https://www.biodiversityfinance.net/seychelles> (All deliverables from the Project are available on the page)

**PA Financing Project:** <https://www.pcusey.sc/index.php/pcu-projects/ongoing/202-paf>

**SeyCCAT:** <https://seyccat.org/>

Seychelles Marine Spatial Plan Initiative: <https://seymsp.com/the-initiative/>

## SECTION III

The Aichi Targets as adopted nationally:

**Target 1:** By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

**Target 2.** By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

**Target 3.** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

**Target 4.** By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

**Target 5.** By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

**Target 6.** By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

**Target 7.** By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

- 7.1. Agriculture
- 7.2. Aquaculture
- 7.3. Forestry

**Target 8.** By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

**Target 9.** By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

**Target 10.** By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their **integrity and functioning.**

**Target 11.** By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.

- **Target 11.1.** Terrestrial and Inland Water Areas.
- **Target 11.2.** Coastal and Marine Areas.

**Target 12.** By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

**Target 13.** By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

**Target 14.** By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

**Target 15.** By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks have been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

**Target 16.** By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

**Target 17.** By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

**Target 18.** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

**Target 19.** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

**Target 20.** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

**Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☒ On track to achieve target
- ☐ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

**Date the assessment was done: November 2018**

#### **Additional information**

Seychelles has integrated environmental education into the broader national educational curriculum since the mid-1990s. Likewise there has been a concerted national media effort over the last 25+ years to educate the public on the value and importance of biodiversity and the progress that Seychelles has made in conserving and sustainably using its biological diversity (see **Section II 1.2**). This has taken the form of regular weekly television programmes based on environment, radio programmes, regular newspaper columns and infomercials on the national television station. The choice of national media in Seychelles is limited and therefore television and radio channels realise high societal penetration (**Bunbury *et al* 2019, Nevill 2001**).

It is clear however that communicating the importance of biodiversity is not the same as engendering a change in public behaviour. This is very apparent for example with regard to public littering and solid waste dumping.

The increase in public awareness can be seen particularly in the growth of biodiversity-related non-governmental organisations (NGOs) (see **Section II 1.2**)

There have also been two very high profile national civil society campaigns against large tourism developments in recent years. These successfully halted major investments that would have intruded upon a protected area and developed the last intact (mountaintop to coast) freshwater ecosystem on the principal island of Mahé, respectively (see **Section II 1.2**).

#### **ABT 1. Gender and Biodiversity.**

In general, both women and men are aware of the values of biodiversity. Current level of awareness raising activity in the country is very high. Biodiversity issues are taught in all schools at all levels. There are programmes such as Wildlife clubs, eco schools etc... that teach students the value of Biodiversity. They even get hands on experiences such as visiting islands (some of which are protected areas), participate in mangrove/tree planting, beach cleanups, hikes, forums that allow them to voice their concerns and many other activities.

Female students studying BSc Environmental Science at the University of Seychelles has always been higher compared to males.

Community Based Organizations steer their own small projects/programmes that benefits most if not all people from their communities. In addition, E-NGOs are actively promoting biodiversity conservation and have extensive educational programmes/campaigns in schools, communities and international contributions. Most of the time female representation in awareness raising is higher when it comes to planning and coordinating events.

The Biodiversity Conservation and Management Division provides oversight for various projects and programmes across the country, the females lead the educational campaigns and marketing.

Women tend to organize more local environmental events. The PR officer is female as well as the Head of the Public Education and Community Outreach (PECO) Section.

Nature Seychelles Conservation boot camp records a higher number of female participants compared to males. During their annual holiday programmes PECO records active participation from both male and female students. For their eco schools programmes girls are active in activities involving poem, essay writing and outdoor activities whilst the boys tend to prefer the outdoor activities.

#### Indicators used in this assessment

In light of the lack of a national database or indices in this domain. Indicators were researched for the purposes of this report. In particular data was gathered on the development of the environmental NGO community and also the change in media coverage of biodiversity issues over time (see **Section II 1.2**).

#### Please describe any other tools or means used for assessing progress

The occurrence of successful public protests, - manifested through action groups, public petitions, public walks and gatherings, and extensive online activism - to prevent controversial developments in environmentally sensitive areas was also noted as an indicator of increased and growing public awareness of the value of biodiversity and the importance of biodiversity-related issues.

#### Relevant websites, web links and files

Civil Society Campaigns:

Grand Police Citizens Initiative: [https://www.facebook.com/pg/SezGPCI/about/?ref=page\\_internal](https://www.facebook.com/pg/SezGPCI/about/?ref=page_internal)

NGO websites:

Environment Education Association Seychelles (EEAS) (Registered 2013):

<https://www.facebook.com/Environment-Education-Association-Seychelles-500012833506101/>

Green Islands Foundation (GIF) (Registered 2006):

<https://www.facebook.com/greenislandsfoundation> & <https://greenislandsfoundation.blogspot.com>

Island Conservation Society (ICS) (Registered 2001):

<https://www.islandconservationseychelles.com> & <https://www.facebook.com/IslandConservationSociety/>

Marine Conservation Society, Seychelles (MCSS) (Registered 1997):

<http://www.mcsc.sc> & <https://www.facebook.com/MarineConservationSocietySeychelles>

Nature Seychelles (Registered

1998): <http://natureseychelles.org/> & <https://www.facebook.com/natureseychelles/>

Plant Conservation Action Group (PCA) (Registered

2002): <http://www.pcaseychelles.org> & <https://www.facebook.com/pcagroup2018/>

Seychelles Sustainable Tourism Foundation (SSTF) (Registered

2017): <http://seychellessustainable.org/> & <https://www.facebook.com/Seychellessustainable/>

Sustainability for Seychelles (S4S) (Registered

2007): <http://www.s4seychelles.com/> & <https://www.facebook.com/s4seychelles/>

Terrestrial Restoration Action Society of Seychelles (TRASS) (Registered 2009):

<https://www.facebook.com/TerrestrialRestorationActionSocietyofSeychelles/>

The Ocean Project, Seychelles (TOP) (Registered 2016):

<http://www.theoceanprojectseychelles.com/> & <https://www.facebook.com/theoceanproject.sey/>

WildLife Clubs of Seychelles (WCS) (Registered 1994):

<https://www.wildlifeclubsofseychelles.org> & <https://www.facebook.com/Wildlife-Clubs-of-Seychelles-136612136380257>

References:



Bunbury, N. *et al* (2019). Five eradications, three species, three islands: overview, insights and recommendations from invasive bird eradications in the Seychelles. In: Veitch, C.R., Clout, M.N., Martin, A.R., Russell, J.C. and West, C.J. (eds.) (2019). Island invasives: scaling up to meet the challenge. Occasional Paper SSC no. 62. Gland, Switzerland: IUCN. xiv + 734pp. ISBN: 978-2-8317-1962-7 <https://doi.org/10.2305/IUCN.CH.2019.SSC-OP.62.en>

Nevill, J.E.G. (2001). Using the Media to Create Awareness and Support for Management of Invasive Species: the Seychelles Experience. In: Wittenberg, R. & Cock, M.J.W. (eds.) 2001. Invasive Alien Species: A Toolkit of Best Prevention and Management Practices. CAN International, Wallingford, Oxon, UK, xvii – 228. ISBN 0 85199 569 1. <https://www.cbd.int/doc/pa/tools/Invasive%20Alien%20Species%20Toolkit.pdf>

#### Level of confidence of the above assessment

- ☐ Based on comprehensive evidence  
☒ Based on partial evidence  
☐ Based on limited evidence

#### Please provide an explanation for the level of confidence indicated above.

No systematic monitoring is undertaken. Indicators were developed as part of the reporting process in an attempt to adequately respond to this query.

#### Adequacy of monitoring information to support assessment

- ☐ Monitoring related to this target is adequate  
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☒ No monitoring system in place  
☐ Monitoring is not needed

#### Please describe how the target is monitored and indicate whether there is a monitoring system in place

During preparation of this report it became apparent that the lead national agency for public education and awareness on biodiversity-related issues, the division of Public Education and Community Outreach (PECO) in the Ministry of Environment, Energy and Climate Change (MEECC), does not maintain a database on national initiatives or a baseline to assess change in public awareness of biodiversity-related issues. This despite clear provision for such measures in the strategic plan (SSDS) it follows. It is strongly recommended therefore that such monitoring regimes be put in place and databases established to assess the status and trends of public education and awareness on biodiversity issues in Seychelles and their impact upon the general understanding of such issues by the general public, the private sector and decision-makers.

#### Relevant websites, web links and files

N/A



**Target 2. By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☐ On track to achieve target
- ☒ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information**

Environment and biodiversity values were incorporated into the development management cycle through the 1994 Environment Protection Act (EPA) and its 1996 Environment Impact Assessment (EIA) regulations. These provisions were carried over to, and expanded upon in, the 2016 Environment Protection Act. The legislation sets out 21 categories of sensitive area that require special consideration when undertaking the planning process for development or related activities. This mechanism functions by the environment ministry (MEECC) having a seat on the Planning Authority and the option of a veto against development proposals. EIAs are undertaken when developments or activities are proposed within sensitive areas as determined by the Sensitive Areas Atlas (SSA) and the 21 categories of sensitive area described in the associated manuals or if the proposed development exceeds a certain size. As such the EPA and its EIA regulations work in tandem with and complimentary to, on an equal basis, the 1972 Town and Country Planning Act (TCPA). This mechanism has been in place since 1996, but issues and concerns about proper integration remain. An attempt was made to harmonise these two pieces of legislation in order to make them equal, distinct and mutually supportive under the GEF mainstreaming biodiversity project. This project enabled a review of both laws with the overarching objective being that of harmonisation. Unfortunately this objective was not realised as each piece of legislation was reviewed separately and within their own sectoral contexts. This resulted in the promulgation of the 2016 Environment Protection Act and the development of the draft Physical Planning Bill which is now in the final stages of the Governmental approval process.

A civil society project also sought to enhance biodiversity integration and public involvement into development planning. The project entitled: *Coastal Development and Ecosystem Modelling as a Tool to Enable Improved Local and National Policy Decision-making Processes* was funded by the Mangroves for the Future (MFF) initiative and undertaken 2010-2012 by the local NGOs the Marine Conservation Society, Seychelles (MCSS) and the Green Islands Foundation (GIF). The project studied four coastal scenarios representative of the spectrum of coastal development in Seychelles. This allowed the modelling of developments relative to the different habitats and the production of criteria for evaluation of potential development by the Environmental Impact Assessment process. A digital database for Government for the planning and EIA process, which is currently being used, supported by MCSS expertise, was developed. A layman's handbook was also developed to facilitate public input into the EIA process.

Biodiversity values, however, are not incorporated into national accounting processes and indeed the country is severely lacking in environmental accounting capacity. Environmental accounting capacity has been recognised as a priority since the first NBSAP (1997) but has yet to be effectively addressed.

It is pertinent to note that the 2016 EPA significantly expanded the mandate of the Environment Ministry with regard to coastal and marine ecosystems including oil and gas exploration.

Furthermore, a new National Development Strategy (NDS), to replace the previous Seychelles Sustainable Development Strategy (SSDS) and its preceding National Environment Management Plans (EMPS 1990-2000 and 2000-2010), was drafted in 2018 including “Pillar 6” on environmental sustainability and resilience which reportedly incorporates biodiversity valuation and accounting measures.

The Seychelles BioFIN Project analysed, *inter alia*, certain aspects of biodiversity mainstreaming in the key development sectors of Tourism, Fisheries and Agriculture the salient points of which are incorporated in the table below supplemented by additional observations from this reporting process:

**Table 7. Integrating Biodiversity Values**

<b>Tourism Sector</b>		
Institution	Role	Constraints/Opportunities
Ministry of Tourism	Overall responsibility for developing the vision and policy for the tourism sector, i.e. sustainable tourism.	Does not have adequate capacity, or the budget to outsource, to properly mainstream biodiversity conservation into tourism (tourism masterplan, tourism policy and strategy). Capacity also lacking to ensure proper coordination with key stakeholders. As part of policy, it is considering small tourism developments within PAs.
Seychelles Tourism Board	Responsible for marketing Seychelles as a high end destination with strong emphasis on its “pristine” environment.	Not seen as participating actively in local biodiversity conservation initiatives (including the BIOFIN process). May not have sufficient awareness of conservation issues to effectively market sustainable tourism.
Ministry of Environment Energy and Climate Change (MEECC)	Works closely with tourism Ministry promoting sustainable tourism. Responsible for oversight & enforcement of EIAs.	EIAs are not always complied with or enforced. MEECC is responsible for PAs where there is pressure for new tourism projects including hotels.
Seychelles National Parks Authority (SNPA)	Responsible for managing marine and terrestrial national parks.	SNPA is scheduled to be returned financial autonomy at the beginning of 2019. In principle this should provide incentives for SNPA to properly collect fees and deliver expected products. Management strength and capacity is a concern in this regard.
Seychelles Planning Authority	Responsible for approving all building and construction projects.	A key constraint is that once plans are approved, there is no systematic monitoring to ensure compliance. The

		planning authority should ensure that all EIA requirements are met.
<b>Fisheries Sector</b>		
Ministry of Fisheries and Agriculture (MoFA)	Responsible for vision, policy and strategy for the fisheries sector. Its objective is to promote and develop sustainable fisheries.	MOFA one of the smallest ministries with a limited budget and capacity.
Seychelles Fishing Authority (SFA)	Responsible for implementation of fishery policy and strategy under the aegis of MoFA.	Chronic capacity shortfall in both management and technical personnel. Not currently addressing threatened species issues.
Ministry of Environment, Energy and Climate Change (MEECC)	Key role in supporting marine biodiversity conservation and sustainable fishing in Seychelles EEZ.	The conservation section has been dramatically reduced in size over the last 15 years. Its capacity now is inadequate to address even its most fundamental commitments.
<b>Agriculture Sector</b>		
MoFA	Responsible for vision, policy and strategy for the agricultural sector. Its objective is to promote and develop sustainable agriculture, including measures to minimise impact upon biodiversity.	Its capacity is limited even with regard to its policy formulation and monitoring role.
Seychelles Agricultural Agency (SAA)	Government agency with mandate to implement policy and strategy for the agricultural sector under the aegis of MAF.	Promote sustainable agriculture, <i>inter alia</i> , by encouraging use of local varieties which are better adapted to local conditions and pests. This in turn would limit damage to Seychelles biodiversity from IAS introduction and excessive chemical use.
Ministry of Finance	Responsible for setting tax and subsidy regime for all sectors.	Has not sufficiently taken into consideration the impact on biodiversity of subsidies accorded to the importation of pesticides and fertilisers.

## ABT 2. Gender and Biodiversity

Seychelles Strategic Land Use development Plan (2014-2040) approved at cabinet level sets the National strategic land use planning framework for Seychelles. The Planning Authority has 18 males, 31 female employees.

The Environment Protection Act (2016) ensures that actions or measures which may avoid, prevent, change, mitigate or remedy the likely effects of the activity or the project on the environment is implemented through its environment impact assessments. Under the EPA, the Environment Impact Assessment (EIA) Regulation requires that, for certain categories of projects

or activities, an EIA must be prepared and an environmental authorization issued. This Regulation aims to ensure that new infrastructure developments do not cause land degradation. The portfolio for EPA sits at the Environment Assessment and Permit Section (EAPS) the section consists of 5 male and 6 female staff.

Coastal management actions are implemented by the Coastal Unit, MEECC. The all-female unit currently contains 2 staff. Seychelles Coastal Management Plan 2019–2024 was developed to enhance understanding about the risks associated with climate change and development pressures around the coastal zones in Seychelles.

#### Indicators used in this assessment

*Indicator(s) used in this assessment*

Seychelles as yet has no mechanism for environmental accounting or economics, as such there are no national indicators in this regard.

or:

☒ No indicator used

#### Please describe any other tools or means used for assessing progress

Stakeholder consultation in national workshops.

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

1994 Environment Protection Act. <https://seylli.org/sc/legislation/consolidated-act/71>

2016 Environment Protection Act. <https://seylli.org/sc/legislation/act/2016/18>

1972 Town and Country Planning Act. <https://seylli.org/sc/legislation/consolidated-act/237>

GEF Mainstreaming Biodiversity Project. <http://www.pcusey.sc/index.php/pcu-projects/completed/86-biodiversity-projects>

Marine Conservation Society, Seychelles. [www.mcscs.sc](http://www.mcscs.sc) and <http://www.mcscs.sc/previous.html>

Green Islands Foundation. <https://greenislandsfoundation.blogspot.com/>

National Biodiversity Strategy and Action Plan 2015-

2020. <http://seychellesbiodiversitychm.sc/wp-content/uploads/2015/07/NBSAP-2.0-Final-Revised-Version-.pdf>

1997 NBSAP. <http://seychellesbiodiversitychm.sc/wp-content/uploads/2014/07/1st-NBSAP.pdf>

Seychelles BIOFIN summary analysis. <https://www.biodiversityfinance.net/seychelles>

#### Level of confidence of the above assessment

☒ Based on comprehensive evidence

☐ Based on partial evidence

☐ Based on limited evidence

#### Please provide an explanation for the level of confidence indicated above.

Recent assessments and most notably the BIOFIN reports confirm that this issue has yet to be substantively addressed.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☒ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

There is no monitoring system in place.

**Target 3. By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☐ On track to achieve target  
☐ Progress towards target but at an insufficient rate  
☒ No significant change  
☐ Moving away from target  
☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information**

No comprehensive national review of incentives has been undertaken to assess their role positive or negative with regard to the conservation and sustainable use of biological diversity. There is reason to believe that there are negative/perverse incentives in place in the context of the tourism industry, agriculture and fisheries (Barois 2018). In the fisheries sector fuel subsidies have been identified as being harmful to biodiversity (Vivid Economics 2015)

The Seychelles Fishing Authority (SFA) recently announced its intention to phase out fuel subsidies by 2022. The Ministry of Fisheries and Agriculture (MoFA), however, is currently undertaking a complete review of fishery policy, management and regulation, and this phase-out may also therefore be up for review. Fishery management is highly politicised in the Seychelles context due to the Seychellois people deriving the vast majority of their protein from fish. The price of fish on the local market is therefore a key socioeconomic and political concern.

**Indicators used in this assessment**

<input checked="" type="checkbox"/> No indicator used
<p><b>Please describe any other tools or means used for assessing progress</b></p> <p>No indicators are currently available to assess this target. Consequently information was gathered from various sectoral reports.</p>
<p><b>Relevant websites, web links and files</b></p> <p>Seychelles BIOFIN summary analysis. <a href="https://www.biodiversityfinance.net/seychelles">https://www.biodiversityfinance.net/seychelles</a></p>
<p><b>Level of confidence of the above assessment</b></p> <p><input type="checkbox"/> Based on comprehensive evidence</p> <p><input checked="" type="checkbox"/> Based on partial evidence</p> <p><input type="checkbox"/> Based on limited evidence</p>
<p><b>Please provide an explanation for the level of confidence indicated above.</b></p> <p>No significant action to assess, mitigate or remove perverse incentives has yet been undertaken. The BioFin initiative (<b>Barois 2018</b>) has identified the need for assessment in key sectors, namely tourism and agriculture, and scope for positive measures. The economics of the Artisanal fishery have been investigated and the fuel subsidy clearly identified as a perverse incentive (<b>Vivid Economics 2015</b>). The Seychelles Fishing Authority has indicated its intention to phase out the subsidy by 2022 however this may change under a current ongoing review by the Ministry of fisheries and agriculture<sup>17</sup>.</p>
<p><b>Adequacy of monitoring information to support assessment</b></p> <p><input type="checkbox"/> Monitoring related to this target is adequate</p> <p><input type="checkbox"/> Monitoring related to this target is partial (e.g. only covering part of the area or issue)</p> <p><input checked="" type="checkbox"/> No monitoring system in place</p> <p><input type="checkbox"/> Monitoring is not needed</p>
<p><b>Please describe how the target is monitored and indicate whether there is a monitoring system in place</b></p> <p>There is currently no monitoring in place and no substantive actions have been undertaken to date to address identified perverse incentives.</p> <p><b>Relevant websites, web links and files</b></p> <p>Seychelles BIOFIN summary analysis. <a href="https://www.biodiversityfinance.net/seychelles">https://www.biodiversityfinance.net/seychelles</a></p>

<sup>17</sup> Post 2018 developments suggest that the phase out has been delayed to 2026.

**Target 4. By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☐ On track to achieve target
- ☒ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

**Date the assessment was done:**

**November 2018**

#### **Additional information**

Seychelles has an established history of integrated environmental management with successive decadal national environmental management plans (EMPS 1990-2000, EMPS 2000-2010). This was followed by the development the Seychelles Sustainable Development Strategy (SSDS 2012-2020) which incorporated a thematic area on sustainable consumption and production. In 2014 Seychelles, with technical and financial support from UNEP, undertook the development of a National Program on Sustainable Consumption and Production (NPSCP) 2015-2024 (**GoS 2014b**). This document was elaborated in line with both the global and African 10 year framework programmes on sustainable consumption and production, and designed to be supportive of and build upon the SSDS. Unfortunately the SSDS was never implemented and neither to date has the NPSCP. This reflects lack of capacity in Government, and in this case specifically the Ministry of Environment, Energy and Climate Change (MEECC) to administer strategic national documents. The SSDS was late in formulation, further delayed in launching and then never actually implemented. Its executive committee met on a couple of occasions but the stakeholder forum was never formed and the document never actually utilised. It remained moribund through 2017, whereupon it was announced that it would be superseded by a new national strategic document to be developed – the National Development Strategy (NDS). At time of reporting the NDS is under development. There is, of course, still time to undertake the implementation of the NPSCP, but this seems unlikely as departmental knowledge of the document appears negligible. A copy could not be obtained from MEECC but was eventually sourced from the author. This is not to say however that various aspects of the SSDS and the NPSCP documents have not been implemented nationally through sectoral plans and initiatives, it is just that the crosscutting strategic documents have not been utilised to drive and/or coordinate that process. This also means however that information on the coordinated national implementation of sustainable consumption and production is unavailable. The NPSCP document, however, does give insight to the status of sustainable consumption and production in Seychelles in the 2014-2015 period and hence is useful here for reporting and is the primary source (**GoS 2014b**) of the information below:

1). Water and Sanitation. Seychelles has two seasons characterised by the north-west monsoon (November to April) and the south-easterly trade winds (May to October). The North-westerly is characterised by abundant rainfall of up to 2m. Whilst the dry season experiences water stress where there is not enough water to satisfy the population, commercial and industrial demand.



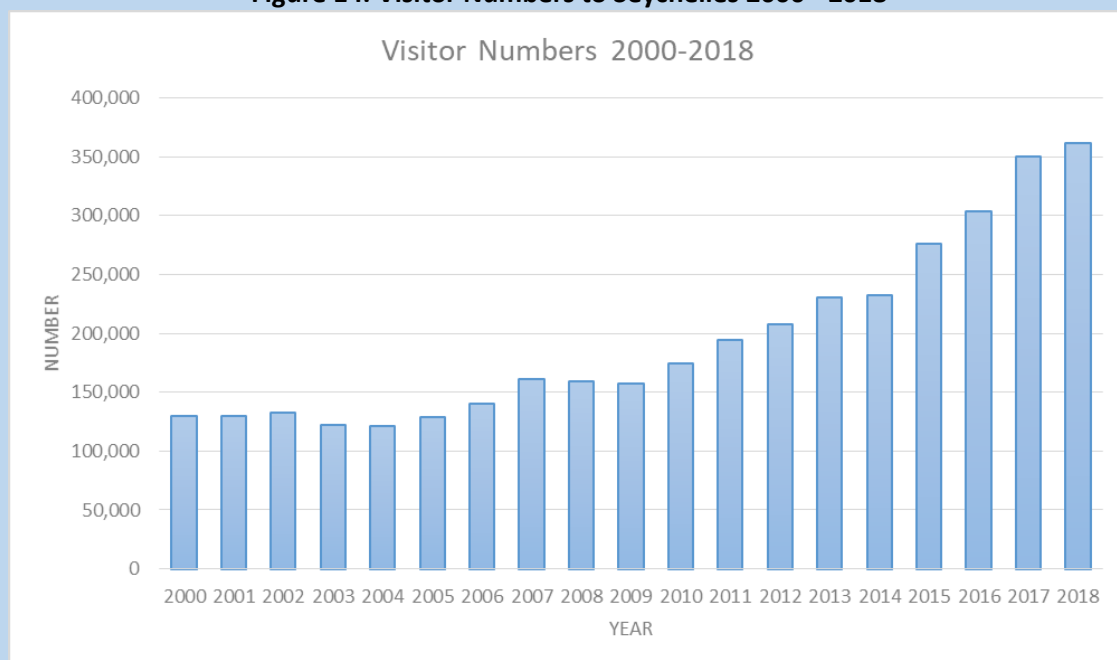
This situation has persisted for more than 30 years in part due to under investment in water storage and distribution capacity as well as subsidised low water tariffs. Water lost from treated source to point of use (unaccounted for water) is approximately 50% reflecting the very poor state of repair of the primary pipe network possibly augmented by faulty meters. It is clear therefore that extensive investment is required to reduce loss of treated water and hence unnecessary tapping of water from natural systems. Seychelles developed a national water plan in 2008 (Water Development Plan 2008 – 2030) to address this water shortage, which is now under implementation. Most notably through the extensive replacement of primary water piping around the island of Mahé and the raising of the La Gogue dam, the country's largest reservoir. The topography of the populated islands of Seychelles makes the provision of integrated sanitation treatment highly problematic. There is a modern wastewater treatment plant located at Providence on the main island of Mahé. This plant is fed through an extensive sewer network serving the capital Victoria and surrounding districts. Another plant is located in the north west of Mahé serving the Beau Vallon, Bel Ombre and Glacis districts. These two systems serve the most densely populated areas of the country. In other areas on Mahé, wastewater is being treated in septic tanks and then discharged into the environment. The Victoria sewerage system is in general in a poor state of repair with frequent breakages, leaks and accidental discharges. A combination of the old sewer network and extensive septic tanks has meant that most rivers in populated areas, at least in the lower reaches, are contaminated with wastewater. Enrichment pollution is widespread as evidenced by extensive algal growth on stream beds. The main priority for sanitation, in order to reduce these pollution events, is to renew the existing centralised sewer, and extend to other areas on the main island. Likewise it is planned to construct centralised sewerage systems on the islands of Praslin and La Digue.

The water and sanitation sector nationally is in need of large capital investment for which innovative financing strategies are required and this is now being actively pursued by the Public Utilities Company (PUC).

2). Waste Management. Solid waste production in its various forms, general littering and the management of collected waste is a key issue of growing concern on the populated islands. The amount of waste brought to landfill per annum between 2004 and 2014 increased by 45%. The majority of waste on Mahé is collected and disposed of in a controlled landfill at Providence. The islands of Praslin and La Digue have a controlled dump site and a sanitary landfill respectively. The extremely limited land area of the islands and multiple pressures for land use mean there are real pragmatic limitations to the amount of waste that can be treated in this manner. A national recycling program was launched in 2007 by MEECC targeting beverage containers (i.e. PET bottles and aluminium cans). This program uses a refundable deposit and in 2014 diverted about 18 million PET bottles from the landfill. The priority of the waste management's cycle in Seychelles is focused upon waste minimisation and recycling. Advanced waste processing such as waste-to-energy is costly due to the lack of national economies of scale in this regard. There is a need to extend the recycling schemes to other waste materials such as electronic waste and more comprehensively target other categories of hazardous material. An initiative is currently looking at the recycling and/or re-use of glass.

3). Tourism. Tourism is the primary industry of Seychelles and numbers visiting the country have grown significantly over the last 10 years.



**Figure 14. Visitor Numbers to Seychelles 2000 - 2018**

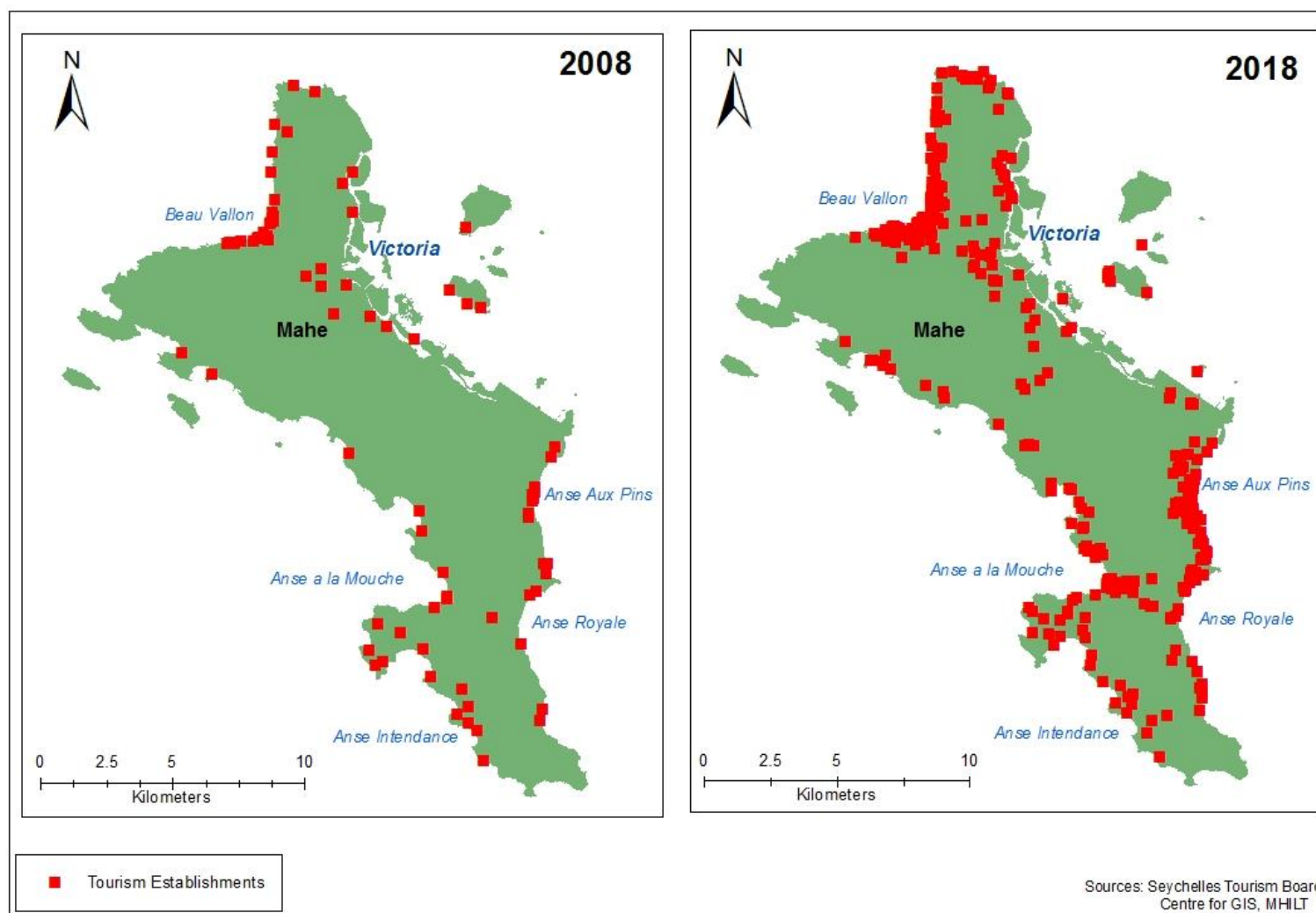
National statistics indicate that the *per capita* consumption of water and electricity is much higher in the tourism sector than the domestic population. Likewise the physical footprint of the tourism industry continues to expand with direct impacts upon natural habitats and national dynamics of production and consumption (See **Maps 16 & 17**).

The primary sustainable consumption and production priority for this sector is to support and further roll-out the Seychelles Sustainable Tourism Label (SSTL) and otherwise ensure that the sector remains sustainable. The SSTL was introduced in 2012 as a sustainability certification for medium and large tourism establishments. Only 20 hotels in Seychelles, however, have to date attained SSTL status significantly fewer than previously hoped. Plans are under development to re-invigorate the SSTL and increase its uptake.

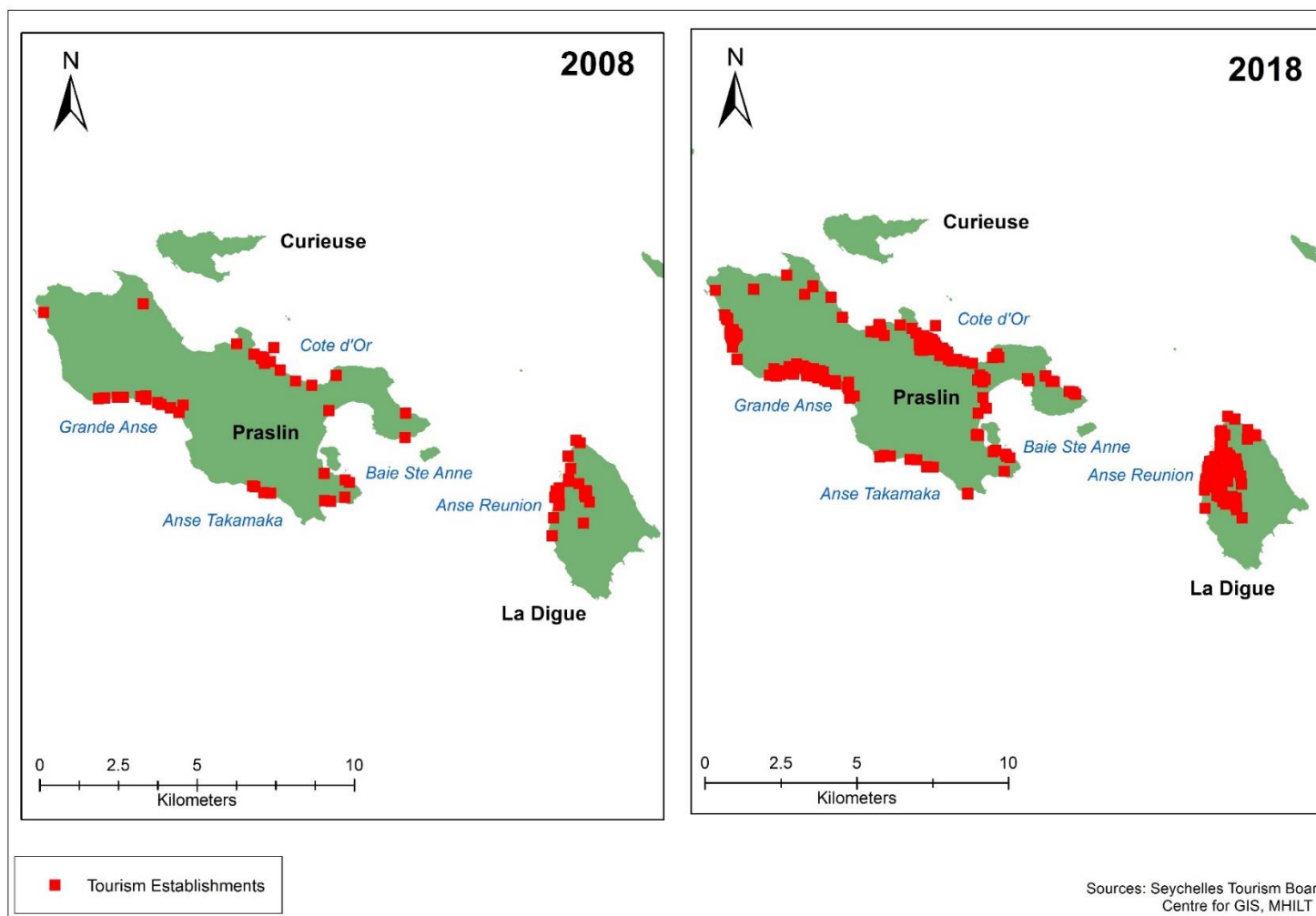
4). **Fisheries**. There is clear evidence of chronic overfishing in the artisanal fishery (see **Section II 1.3 and ABT 6**). Likewise there are legitimate concerns about the efficacy of pelagic stock management under the auspices of the Indian Ocean Tuna Commission (IOTC) (see **Section II 1.3 and ABT 6**). The key priority in this sector is to develop and implement policies which ensure long-term sustainability of the fishing industry, including improved monitoring control and surveillance.



**Map 16. Growth in Tourism Establishments, Mahe Island 2008 – 2018 (STB & GIS MHILT)**



**Map 17. Growth in Tourism Establishments, Praslin and La Digue Islands 2008 – 2018 (STB & GIS MHILT)**



<p><b>ABT 4. Gender and Biodiversity</b></p> <p>Gender Mainstreaming is one of the core principle of “The Seychelles National Agricultural Investment Plan 2015-2020 which emphasize the importance of sustainable local production within the context of the broader national development priorities and goals.</p>
<p><b>Indicators used in this assessment</b></p> <p>No specific indicators exist as there is no coordinated national administration of this domain.</p> <p><input checked="" type="checkbox"/> No indicator used</p>
<p><b>Please describe any other tools or means used for assessing progress.</b></p> <p>The NPSCP document provides some insight.</p> <p>Further information was obtained from various sectoral interviews and stakeholder workshops undertaken during the formulation of this report.</p>
<p><b>Relevant websites, web links and files</b></p> <p>N/A</p>
<p><b>Level of confidence of the above assessment</b></p> <p><input type="checkbox"/> Based on comprehensive evidence</p> <p><input checked="" type="checkbox"/> Based on partial evidence</p> <p><input type="checkbox"/> Based on limited evidence</p>
<p><b>Please provide an explanation for the level of confidence indicated above.</b></p> <p>No specific databases or indices are available for the implementation of sustainable consumption and production in Seychelles. The information presented here was obtained from stakeholder interaction and review of the NPSCP 2015-2024 document.</p>
<p><b>Adequacy of monitoring information to support assessment</b></p> <p><input type="checkbox"/> Monitoring related to this target is adequate</p> <p><input type="checkbox"/> Monitoring related to this target is partial (e.g. only covering part of the area or issue)</p> <p><input checked="" type="checkbox"/> No monitoring system in place</p> <p><input type="checkbox"/> Monitoring is not needed</p>
<p><b>Please describe how the target is monitored and indicate whether there is a monitoring system in place</b></p> <p>There is currently no national or strategic monitoring system in place for this target.</p> <p><b>Relevant websites, web links and files</b></p> <p>N/A</p>

**Target 5. By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☒ On track to achieve target - **terrestrial habitats (including inland waters)**
- ☐ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☒ Moving away from target - **marine habitats**
- ☐ Unknown

It was agreed by stakeholders to score marine and terrestrial habitats separately in this assessment as the circumstances and performance nationally are very different.

**Date the assessment was done: November 2018**

**Additional information**

1). Terrestrial habitats

Forests and inland waters, their sub-categories and the anthropogenic changes they have undergone through time have been described in the 4<sup>th</sup> and 5<sup>th</sup> national reports to the CBD (GoS 2011, 2014a). Detailed information is set out in **Section II 1.8** of this report entitled **Ecosystem Rehabilitation**. One of the key considerations in scoring Seychelles as on track with this target is the excellent work being undertaken on Aldabra atoll which constitutes approximately 1/3 of Seychelles' total land mass (See **Section II 1.8: "Other relevant Information"**).

2). Marine Habitats.

Coral Reefs. Previous reports (GoS 2011, 2014a, Nevill *et al* 2015) have covered coral bleaching events and further information is provided in **Section II 1.3** and **Section VII 2 & 2 vi** of this document - including **Maps 29 & 30** which show known Coral reef distribution. Another serious bleaching event took place in 2016, the data for which is not currently available in a processed form.

Seagrass. Maps (**Maps 24-28**) of known seagrass beds are included in **Section VII**.

Mangroves. Mangrove coverage has been relatively stable except for the small and ongoing expansion in the East Coast lagoons of Mahé. The Seychelles Islands Foundation (SIF) recently published detailed maps of the lagoon of Aldabra Atoll (see **Section II 1.8**).

ABT 5. Gender and Biodiversity

Biodiversity loss affects men, women, elderly people and youth in different ways.

Although the country has adequate legislation in place, capacity to enforce laws relating to habitat protection and conservation is often limited due to inadequate resources. For example the Biodiversity Conservation and Management Division has only 17 staff (10 males and 8 females). Male staff are usually the front line staff, responding to issues such as forest fires and or illegal lighting of fires, dangerous tree emergencies, poaching and illegal activities of timber harvesting. Female staff have some of these responsibilities but tend to focus more on policy development, impact assessments, restoration and rehabilitation of degraded habitats and education and awareness.

**Indicators used in this assessment**Terrestrial Habitats.

Forest cover on populated granitic islands.  
 Lowland wetland area protected.  
 Rehabilitation of small island ecosystems (area).  
 Enhanced ecosystem health indicators on Aldabra atoll.

Marine Habitats.

Percentage live coral cover on reefs.  
 Percentage algal dominated reefs.  
 Area of mangrove forest.

**Please describe any other tools or means used for assessing progress**

There have been extensive coral reef surveys undertaken in Seychelles many on a structured recurrent basis following the 1998 severe coral bleaching event. See **Section II 1.8 Coral Reefs** and associated references.

**Relevant websites, web links and files**

See **Section II 1.8 Coral Reefs** and associated references.

See **Section II 1.8: "Other relevant Information"** and associated references.

**Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence  
☒ Based on partial evidence – **Terrestrial habitats** (including inland waters), **Marine habitats coral reefs**  
☒ Based on limited evidence – **Marine habitats (excluding Coral reefs)**.

**Please provide an explanation for the level of confidence indicated above.**

There is significant information available (see **Section II 1.8** and **Section VII**) regarding terrestrial habitats and coral reefs. Information is however very limited with regard to sea grass beds and deep water benthic habitats.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☐ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

The national Geographic Information System (GIS) database, maintained by MEECC, is a repository for national mapping of habitat types and the change in area and distribution through time.

**Relevant websites, web links and files.**

N/A

**Target 6. By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☐ On track to achieve target  
☐ Progress towards target but at an insufficient rate  
☐ No significant change  
☒ Moving away from target  
☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information.**

Progress has been made in terms of establishing an enabling policy and legislative framework for sound fishery management this includes: the 2014 Fisheries Act which sets the framework for fishery co-management, the Mahé Plateau demersal fishery plan, the ongoing development of the Seychelles Marine Spatial Plan which will provide differing degrees of protection to 30% of the Country's waters (**see Section II**), the development of the Blue Economy Roadmap for Seychelles and the development of highly innovative new financing mechanism to support marine conservation, sustainable use and research (**see Section II 1.9**).

These activities bode well for the future, but current trends in fishery catch, specific catch management initiatives and ecosystem quality continue to be negative. Breaking down the elements of this target is illuminating.

**Table 8. Analysis of Implementation of ABT 6**

Clause	Text	Status
1	all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably,	Where data is available it indicates that the majority of stocks are not being harvested sustainably. This is apparent in overall declining catch in the artisanal fishery and in the regional industrial fishery where only five of 15 targeted stocks are considered to not be overfished or subject to overfishing. There is evidence to indicate that the lobster fishery is currently being sustainably managed even though that is on a boom and bust basis but anecdotal evidence would suggest that if allowed to rehabilitate sustainable catches could be much higher.
	legally and applying ecosystem based approaches	There is significant evidence to demonstrate that illegal fishing practices are widespread in the artisanal fishery (e.g. illegal net use, spear gun use, fishing in no fish areas, poaching of protected



		species). The ecosystem based approach whilst referred to in the Mahé plateau demersal fishery plan has no substantive activities for its application. The IOTC is clearly failing to address ecosystem issues such as by catch.
	so that overfishing is avoided	Overfishing is clearly not being avoided, indeed available data suggests that most targeted stocks are currently subject to overfishing.
2	recovery plans and measures are in place for all depleted species	Recovery plans are only currently in place for sea cucumber fishery and the yellowfin tuna. The demersal fishery plan lays the foundation the development of recovery measures for certain species but has yet to be implemented.
	and vulnerable ecosystems	There are currently no recovery plans in place for vulnerable marine ecosystems such as coral reefs and seagrass beds.
3	the impacts of fisheries on stocks,	There is clear evidence that fishing in Seychelles has fished down the food web with strong declines in populations of apex in secondary predators. Data suggest that the majority of targeted stocks are overfished and subject to ongoing overfishing.
	species	A 2017 survey recorded 24 threatened species (IUCN criteria) being legally caught in the artisanal fishery. Seychelles is furthermore not meeting its international obligations with regard to various threatened species.
	and ecosystems are within safe ecological limits.	Criteria for safe ecological limits are only applied for a few fisheries, notably for targeted stocks of the industrial tuna fishery, but even then with limited success.

So to conclude, an enabling framework for positive progress has been put in place but has yet to be implemented, in the meantime the status of marine stocks, key ecosystems and threatened species has in general continued to decline.

#### Indicators used in this assessment

Overall artisanal catch tonnage per annum  
 Lobster and sea cucumber catch per annum.  
 Catch by fish family per annum: Serranidae, Lethrinidae, Siganidae.  
 Shark as a percentage of artisanal catch through time.  
 Grey reef shark catch demographics.  
 IOTC species stock status.  
 IOTC shark By-catch stock status.  
 Percentage live coral cover.  
 (See **Section II 1.3** for details)

or:

☐ No indicator used

**Please describe any other tools or means used for assessing progress**

National stakeholder workshop consultation.

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Fisheries Act 2014: <https://seylli.org/sc/legislation/act/2014/20->

Conservation and Climate Adaptation Trust of Seychelles Act:

<https://seylli.org/sc/legislation/act/2015/18>

SeyCCAT: <https://seyccat.org/>

MSP website: <https://seymsp.com/>

SFA website: <http://www.sfa.sc/>

Blue Economy Roadmap: <http://thecommonwealth.org/project/seychelles-blue-economy-strategic-roadmap-and-implementation>

Sea references section appended to this report.

**Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence  
☒ Based on partial evidence  
☐ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

<Text entry>

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☐ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

This target is monitored through:

- The monitoring of fishery catches and the demographic nature of the catch.
- The monitoring of coral reef health in particular in terms of live coral cover.

**Relevant websites, web links and files.**

SFA website: <http://www.sfa.sc/>

Seychelles Seatizens: [www.seatizens.sc](http://www.seatizens.sc)

**Target 7. By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.**

**Target 7.1 Agriculture.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☐ On track to achieve target  
☒ Progress towards target but at an insufficient rate  
☐ No significant change  
☐ Moving away from target  
☐ Unknown

**Date the assessment was done:**

**November 2018**

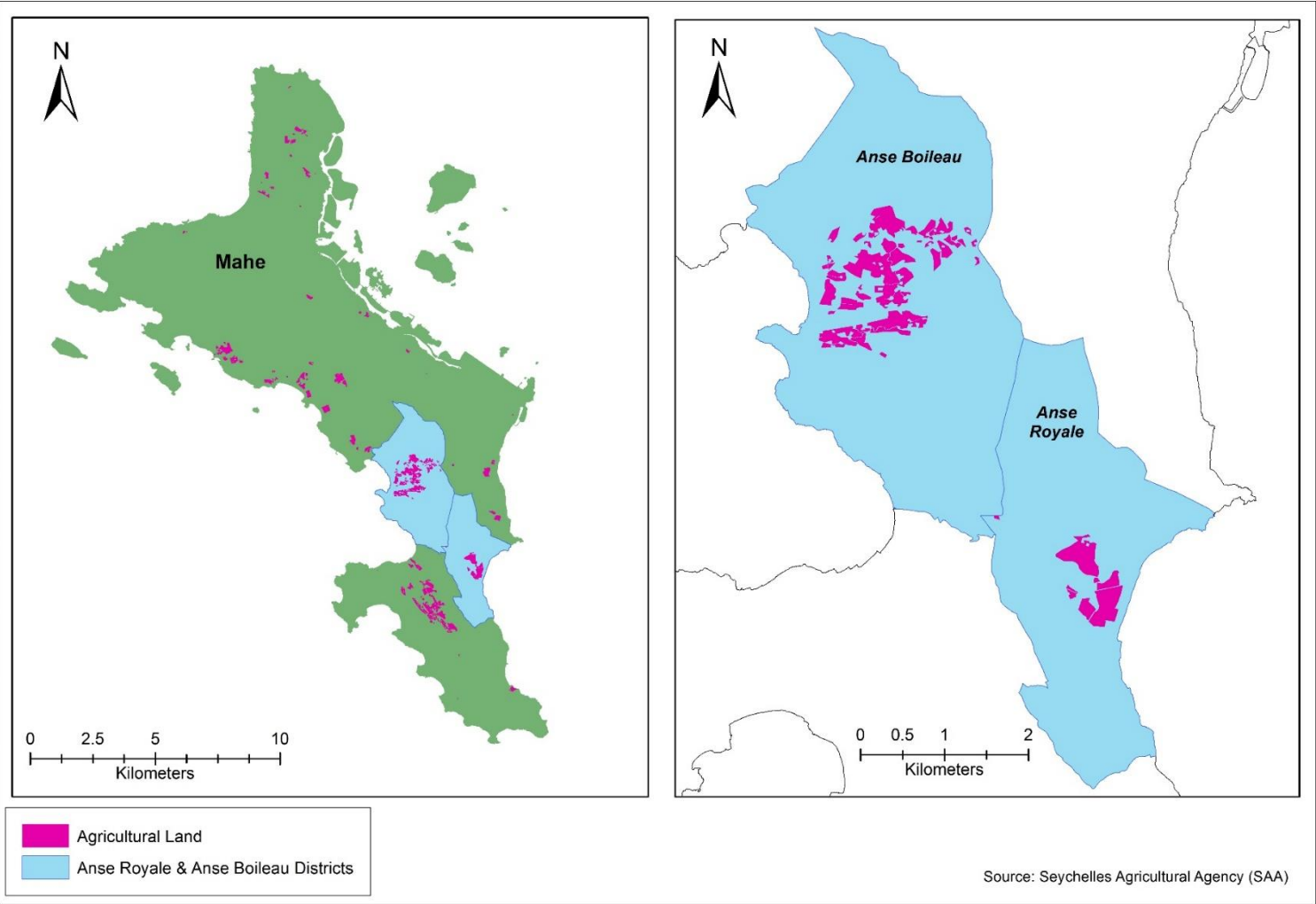
**Additional information**

The primary limiting factor in undertaking this assessment is that much of the requisite information is unavailable. Databases are not maintained regarding the key issues of water use/conservation, the application of plant protection products or pesticide use. Likewise whilst soil conservation is an issue of key importance in Seychelles due to the steep topography of many areas there is no database covering soil loss or run-off issues or events. Hence without a baseline data set or details of the amount of mitigation measures in place or their efficacy, progress towards the target cannot be readily assessed.

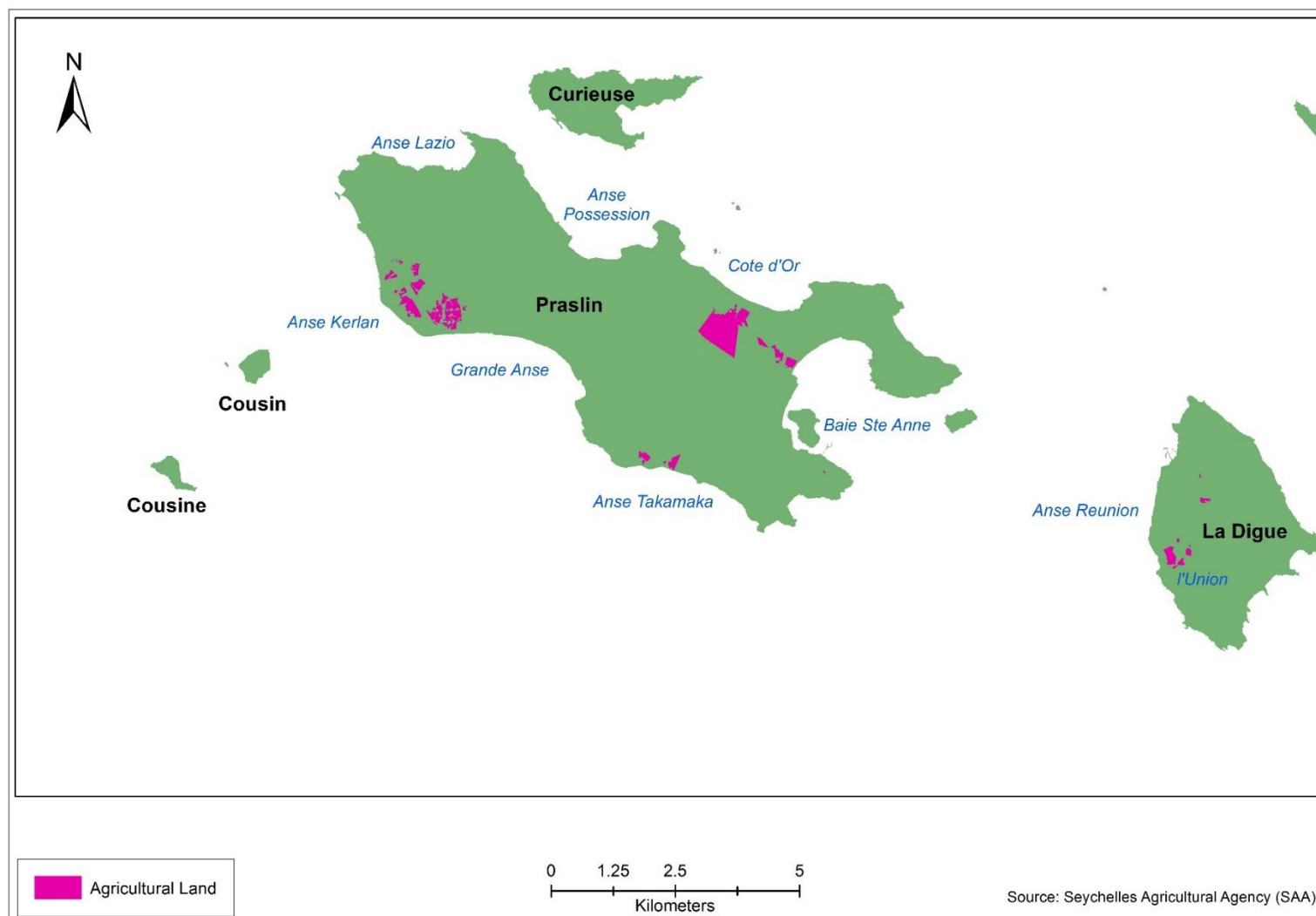
There are however various initiatives aimed directly or indirectly at supporting this target. These include:

- the mapping of agricultural land on the islands of Praslin and La Digue (see **Map 19**), and the recent updating of this process on the main island of Mahe - notably in the districts of Anse Royale and Anse Boileau (see **Map 18**)
- The promotion of use of plant protection products such as: netting, eco-friendly products *et cetera*.
- Whilst there is no certified system for sustainable agricultural land management, best practices for sustainable land management are in place and promoted.
- While there is no specific sustainable production and consumption plan for the agricultural sector there is a general approach that promotes sustainability.
- There is no information available on extinction risk and populations of forest specialist species in production forest areas but agroforestry as a form of sustainable agriculture is being investigated nationally. Since 2016, seven farms have been established, under planting canopy adjacent to existing open agricultural areas. There is a focus in this work of removal of alien species in the forest undergrowth. Training has been provided and under planting consists primarily of fruit production.
- Information is not available with regard to the impact of agricultural pesticides and excess nutrients to ecosystem function and biodiversity. There is however a centralised government record of the importation of such chemicals (see **Section III ABT 8**)

Map 18. Agricultural Land Mahe Island with focus on Anse Boileau and Anse Royale (SAA).



**Map 19. Agricultural Land on Praslin and La Digue Islands (SAA)**



**ABT 7. Gender and Biodiversity**

The Seychelles Agricultural Investment Plan (2015-2020) identifies gender mainstreaming as an important element in its five programmes which includes sustainable agriculture, fisheries and aquaculture as well as food security and human capacity development.

**Indicators used in this assessment**

Structured indicators are not available or maintained to support assessment of implementation of this target. Information on initiatives that support directly or indirectly the implementation of this target were obtained through interviews with senior officials in the agricultural sector and through stakeholder consultation in workshops.

or:

☒ No indicator used

**Please describe any other tools or means used for assessing progress**

Information on initiatives that support directly or indirectly the implementation of this target were obtained through interviews with senior officials in the agricultural sector and through stakeholder consultation in workshops.

**Relevant websites, web links and files.**

Ministry of Fisheries and Agriculture: <http://www.mofa.gov.sc/index.html>

Seychelles Agricultural Agency: <http://www.mofa.gov.sc/agency-saa.html> & <https://www.facebook.com/SeychellesAgriculturalAgency>

Seychelles' National Food and Nutrition Security Policy (NFNSP): <http://www.mofa.gov.sc/downloads/seychelles-national-food-nutrition-security-policy.pdf>

**Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence  
☐ Based on partial evidence  
☒ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

Structured information and indicators regarding the implementation of this target are not available. Baseline information regarding the impact of agriculture upon biodiversity is also not available. Therefore a quantitative assessment of progress in the implementation of this target is not possible. However there are various ongoing national initiatives that support the implementation of this target.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☒ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

There is no monitoring system in place.

**Target 7. By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.**

**Target 7.2. Aquaculture**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☒ On track to achieve target
- ☐ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information** (Please provide information on the evidence used in the assessment of this target, drawing upon relevant information provided in section II, including obstacles in undertaking the assessment).

Aquaculture is not new to the Seychelles islands. In 1989, the Island Development Company (IDC) and the Seychelles Marketing Board (SMB) established a prawn farm in Coetivy to produce black tiger prawns. It however ceased operation in 2009.

There is currently only one small-scale aquaculture operation in Seychelles which produces Giant clams (*Tridacna maxima*) and pearl oysters (*Pinctada margaritifera*). This has been operation since the early 1990s and has a small land based operation which doubles as a tourism attraction with various species on display and operates its pearl production area in the waters between the islands of Praslin and Curieuse.

The Government, however, through the Seychelles Fishing Authority has undertaken a lengthy and comprehensive process to develop a Mariculture Masterplan including: scoping studies, site identification (see **Map 20** overleaf), candidate species selection, economic modelling and stakeholder engagement. An Environment and Social Impact Assessment (ESIA) was undertaken with mitigation measures recommended to avoid or reduce negative impacts of the sector. 2018 saw the construction of an aquaculture facility in the providence industrial zone of the principal island of Mahé. This is expected to commence operation in 2019 with development of brood stock sourced from local waters. The project will start with 4 species: the brown marbled grouper (*Epinephelus fuscoguttatus*), Emperor red snapper (*Lutjanus sebae*), Mangrove snapper (*Lutjanus argentimaculatus*) and the Snubnose pompano (*Trachinotus blochii*).

**ABT 7. Gender and Biodiversity**

The Aquaculture Section within the SFA was established with the aim of managing, coordinating, undertaking research and development, and ensuring that the regulations for aquaculture are properly adhered to. Currently, 7 men and 6 women work within the section. Raising awareness amongst youths for potential employment opportunities is of critical importance. For that reason an Aquaculture Education and Awareness Programme was developed by the SFA to sensitize the

public about the sector and the benefits and opportunities that can arise from it. A Mariculture Master Plan was developed in 2017.

As the sector grows SFA plans to ensure that research and development interventions are inclusive and meet the needs of everyone.



Map 20. Aquaculture Farm Sites and development Zones (SFA)



**Indicators used in this assessment**

Comprehensive nature of the scoping and planning for the projected development of the sector.

or:

☐ No indicator used

**Please describe any other tools or means used for assessing progress****Relevant websites, web links and files**

Seychelles Fishing Authority. <http://www.sfa.sc/index.php/sections/aquaculture>

Pearl and Clam farm.

<https://www.blackpearlseychelles.com/about>&<https://www.youtube.com/watch?v=XmAuJdXpfCI>

**Level of confidence of the above assessment**

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

Aquaculture in Seychelles is currently restricted to one small private sector operation. The authorities however have undertaken an extensive and structured approach to developing in mariculture masterplan in line with best international practice. A facility has been constructed on the main island of Mahé to investigate the feasibility of developing locally sourced food stocks with which to facilitate private investment in this industry in line with the masterplan. The industry therefore is still very much in its embryonic phase and only partial evidence is available. This evidence however is positive with regard to how the development of this industry is being structured and prepared for in particular with regard to environmental and socio-economic impacts on the minimisation and/or mitigation thereof.

**Adequacy of monitoring information to support assessment**

☐ Monitoring related to this target is adequate

☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☐ No monitoring system in place

☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place****Relevant websites, web links and files**

Seychelles Fishing Authority. <http://www.sfa.sc/index.php/sections/aquaculture>

**Target 7. By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.**

**Target 7.3. Forestry.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☐ On track to achieve target  
☐ Progress towards target but at an insufficient rate  
☐ No significant change  
☐ Moving away from target  
☒ Unknown

**Date the assessment was done: November 2018**

**Additional information.** The Seychelles National Parks Authority (SNPA) is responsible for forestry in Seychelles. Unfortunately despite repeated correspondence and telephone calls, over a period of 12 months, no substantive response has been received with regard to SNPA's implementation of any of the ABTs. The BIOFIN reports (**Barois 2015 & 2018a**) cite lack of executive and technical capacity within SNPA as representing key concerns regarding the return of the SNPA to financial independence and its ability to meet its "expected deliverables". The lack of feedback to a national reporting process central to the role of SNPA would appear to support such concerns.

**ABT 7. Gender and Biodiversity**

Forestry is a male dominated sector. The Seychelles National Parks Authority (SNPA) currently manage six marine and three terrestrial national parks spread over the three main islands. Its Board is chaired by a woman and is comprised of 6 women and 2 men. All CEOs to date have been male. The Authority currently has 13 women and 25 men working in its Forestry Section. One of the roles of the section is to undertake routine maintenance, integrated management, development and extension of forest plantations and reserves.

**Indicators used in this assessment.** Areas designated as being under active forestry management administered by SNPA (see **Maps 21 & 22**)

**Please describe any other tools or means used for assessing progress** N/A

**Relevant websites, web links and files**

SNPA Forestry: <https://www.snpa.gov.sc/index.php/national-parks/forestry>

**Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence  
☐ Based on partial evidence  
☒ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

Status is unknown as no feedback received from agency responsible for Forestry.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate
- ☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
- ☒ No monitoring system in place
- ☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

No monitoring system in place.

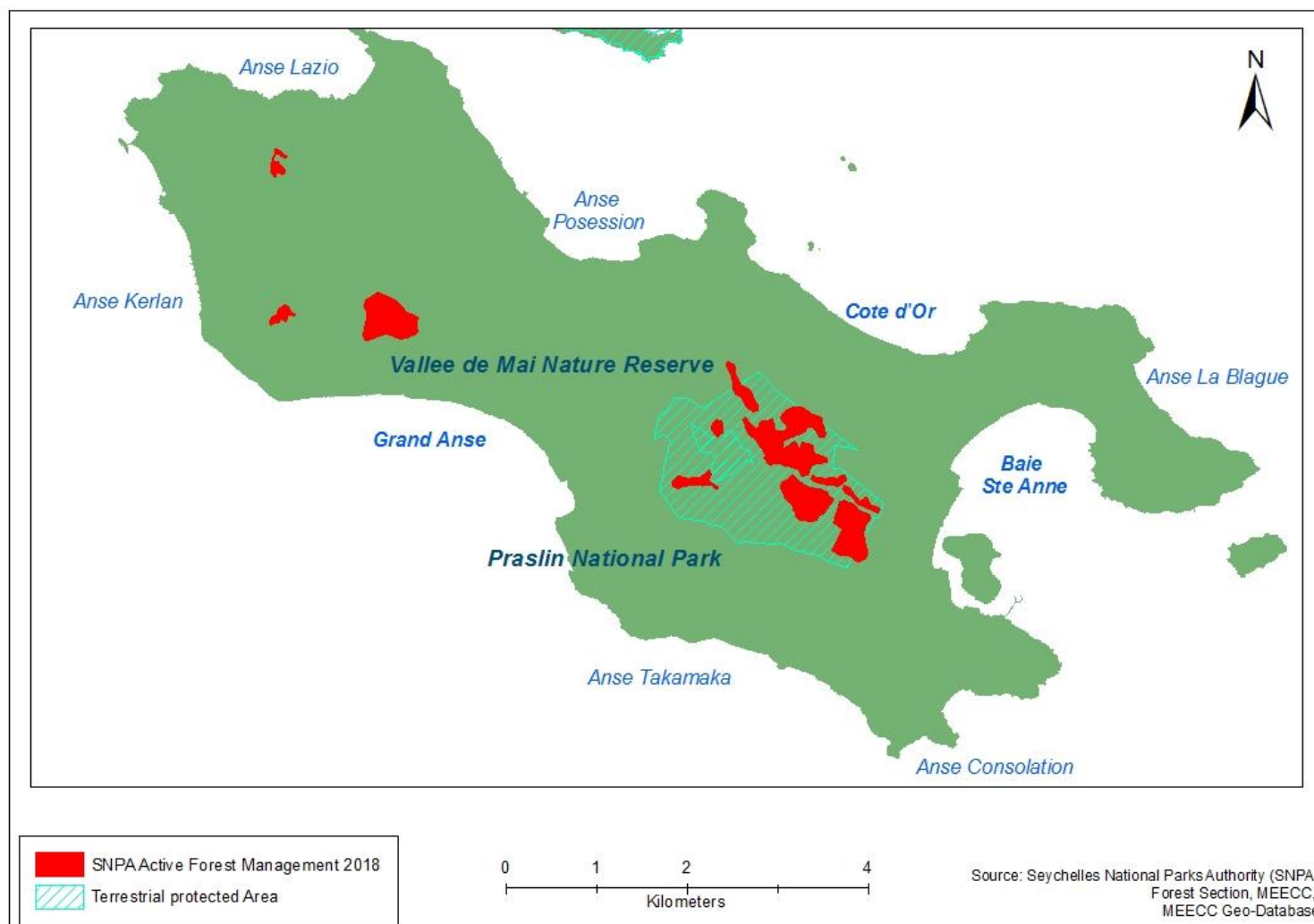
**Relevant websites, web links and files** N/A

**Map 21. Areas on Mahé Designated as being under Active Forestry Management (MEECC GIS)**





**Map 22. Areas on Praslin Designated as being under Active Forestry Management (MEECC GIS)**



**Target 8. By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☐ On track to achieve target  
☒ Progress towards target but at an insufficient rate  
☐ No significant change  
☐ Moving away from target  
☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information.**

There is no national monitoring regime<sup>18</sup> or database on ambient environmental quality so it is not possible to ascertain changes in that status or determine whether the current situation is detrimental to ecosystem function. As such there is no database or baseline on the ambient environmental quality. Permissible effluent standards are however stipulated in the Environment Protection Act (GoS 1995). Seychelles' small population, limited industrial base and isolation from exterior pollution sources means that in general it is believed that ambient environmental quality is in general good.

Records are maintained on chemical imports but the information provided for this assessment did not separate imports by usage or, in many cases, provide the actual amount or chemical composition of the product. There is also no comprehensive database on chemical storage sites and their location. Records are maintained of detected pollution events, but this information is not publicly available and is not compiled into databases to enable assessment of change in occurrence. Neither is there mapping of pollution or sedimentation events which would assist in the development of baselines from which to target action and judge the efficacy thereof.

There are however various national initiatives targeting the reduction of pollution in Seychelles. These include:

- Priority areas are monitored for effluent standards such as: large hotel sewerage treatment plants, public sewage treatment plants, major factories e.g. the Indian Ocean Tuna factory complex at Port Victoria and the main landfill site at Providence.
- There are tax exemptions for the purchase and importation of equipment for recycling operations e.g. scrap metal, glass et cetera. No assessment of perverse incentives has been undertaken however.
- There is a national PET bottles and aluminium can redemption scheme, the programme uses a partial refundable deposit to divert about 18 million PET bottles from the landfill every year (GoS 2014b).

<sup>18</sup>There is a plan for monitoring ambient environmental quality but in reality there is insufficient capacity to undertake it. There are only three pollution officers on staff and the section in question no longer has a mobile laboratory but rather must seek to undertake testing through laboratories held by other agencies with differing priorities.



- Single-use plastic bags were banned in 2017 nationally and there are proposals underdevelopment and consideration to phase out the use of other non-biodegradable single-use items such as plastic straws.
- The Ministry of Environment (MEECC) through its Waste, Enforcement and Permit Division screens applications for chemical imports and controlled substances entering the country through this mechanism.
- The national Public Utilities Corporation (PUC) has a sanitation masterplan which is actively extending the integrated sewage treatment throughout the Seychelles.

#### ABT 8. Gender and Biodiversity

Women and men alike play a critical role in managing natural resources as everyone is affected by environmental degradation.

In response to the issues of marine plastic pollution affecting Seychelles, two young women, co-founded The Ocean Project Seychelles (TOP) in 2016. Since its establishment the Ocean Project has hosted around 41 coastal clean ups and have engaged more than one thousand volunteers. A Seychelles Free from Plastic Bags was a campaign launched by the SIDS Youth AIMS Hub in 2015. Most of SYAH members are female, 62 compared to 13 males.

#### **Indicators used in this assessment**

*Indicator(s) used in this assessment*

or:

☒ No indicator used

#### **Please describe any other tools or means used for assessing progress**

No structured indicators were available for use in the undertaking of this assessment. Rather information was gathered through interviews with senior management and technical staff and stakeholder consultations.

#### **Relevant websites, web links and files.**

**GoS (1995).** Seychelles Effluent Discharge Quality Standards. Environment Protection (Standards) Regulations, 1995. S.I. 83 of 1995. <http://www.water-treatment.com.cn/resources/discharge-standards/seychelles.htm>

GoS (2014e). Republic of Seychelles. Wastes Management Policy 2014-2018. Managing for sustainability. <http://www.meecc.gov.sc/index.php/mdocs-posts/seychelles-waste-management-policy-2014-2018/>

Ministry of Environment, Energy and Climate Change. <http://www.meecc.gov.sc/>

Public health act. <https://seylit.org/sc/legislation/consolidated-act/189>

**GoS (2011a).** National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants. <https://www.informea.org/en/action-plan/republic-seychelles-national-implementation-plan-0>

#### Files:

GoS (2014b). National Programme on Sustainable Consumption and Production 2015-2024. Republic of Seychelles.

#### **Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence  
☐ Based on partial evidence  
☒ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

There is a lack of structured data available upon which to base any assessment of progress with regard to this target. There are however various substantive national initiatives that seek to reduce instances of pollution, point source or otherwise, and improve ambient environmental quality.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☒ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

There is currently no structured monitoring of ambient environmental quality from which to base assessment of positive change. Records are maintained of pollution events but these are not available in a format that could be used to generate indicators with regard to this target. It should be noted however that Seychelles' small population, limited industrial base and isolation from exterior pollution sources means that in general it is believed that ambient environmental quality is in general good.

**Relevant websites, web links and files.**

N/A.

**Target 9. By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☐ On track to achieve target  
☒ Progress towards target but at an insufficient rate  
☐ No significant change  
☐ Moving away from target  
☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information**

Seychelles embodies the criteria of an evolutionarily and geographically isolated ecosystem and is thus particularly vulnerable to IAS. Indeed IAS is recognised as posing the primary threat to Seychelles terrestrial biodiversity (Nevill *et al* 2015). Seychelles has made great progress over the last 20 years in the management of IAS specifically in the context of alien mammalian predators (rats and cats) in small island ecosystems (see Section II 1.6) but increasingly with avian invaders on larger islands as well (see Case study 2).

A dedicated National Biosecurity Agency was formed in 2016 to focus on this high impact issue for Seychelles (see Section II 1.1) examples of its successes and challenges are included in **Table 5** and **Info Boxes 1 -4** in **Section II 1.6**.

Fundamental challenges are posed by hillside forest between 200-500m elevation which is known to be the key habitat band for endemic biodiversity but is over run with invasive tree and plant species. The status of endemic biodiversity in this habitat and the ongoing impact of IAS is unknown and research is required to identify priority actions and develop biodiversity indicators to guide management measures.

The lack of survey and assessment of marine IAS in Seychelles is also potentially a matter of key concern particularly with regard to Seychelles' growing role as a shipping hub in the region.

**ABT 9. Gender and Biodiversity**

The National Biosecurity Agency had 32 females and 27 males employed (NBA 2018). The Agency is responsible for biosecurity protection in Seychelles with the mandate to prevent the introduction and spread of animal and plant pest and disease including Invasive Alien Species.

**Indicators used in this assessment**

Area of mammalian predator free land in Seychelles.

Successful eradications of alien species populations (**Case Studies 1 & 2, Figure 12, Info Box 2**)

Population status of key endemic species threatened by IAS. (see **ABT 12** and **section II 1.7**)

Number of new agricultural pests through time and their control or spread.

or:

☐ No indicator used**Please describe any other tools or means used for assessing progress**

Establishment of legislation and governance agency for biosecurity.

**Relevant websites, web links and files.**

[https://www.researchgate.net/publication/331743335\\_Five\\_eradication\\_three\\_species\\_three\\_islands\\_overview\\_insights\\_and\\_recommendations\\_from\\_invasive\\_bird\\_eradication\\_in\\_the\\_Seychelles](https://www.researchgate.net/publication/331743335_Five_eradication_three_species_three_islands_overview_insights_and_recommendations_from_invasive_bird_eradication_in_the_Seychelles)

**Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence  
☒ Based on partial evidence  
☐ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

Significant progress has been made in Seychelles with regard to specific cases and instances of IAS and these have been reported on in detail in previous reports with some expanded upon here. Also the establishment of the Biosecurity Agency and its associated legislation highlights the institutional progress being made towards realising this target. There are however significant areas where information is lacking most particularly what is the status of IAS impact upon endemic species in the priority area of 200 to 500 m elevation on the islands of Mahé and Silhouette, and what are the status and trends of marine IAS in Seychelles. Without information on those two key matters evidence can only be considered to be partial at best.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☐ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

There is no specific national monitoring system to assess implementation of this target. Rather pertinent databases are maintained by various agencies, governmental and civil society. Information on agricultural pests is maintained by the National Biosecurity Agency, however this is not available in spreadsheet or tabulated form to enable, for example, rapid assessment of change through time. Information regarding invasive species which have a primary impact upon indigenous biodiversity are maintained by the Ministry of Environment, Energy and Climate Change, and various civil society agencies (e.g. NGOs, private individuals, private companies). These data are likewise often difficult to access and when available typically are not formatted in a way suitable for ready application to assessment of the implementation of this target.

**Relevant websites, web links and files.**

N/A

**Target 10. By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.** (This response pertains to national efforts to address direct local anthropogenic pressures, and does not relate to national efforts to reduce CO<sub>2</sub> emissions etc... and increase carbon sinks)

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☐ On track to achieve target
- ☐ Progress towards target but at an insufficient rate
- ☒ No significant change
- ☐ Moving away from target
- ☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information.**

The Seychelles NBSAP (Nevill *et al* 2015) identified overfishing as the primary threat to marine biodiversity followed by climate change. To mitigate the impact of climate change on marine biodiversity and coral reef ecosystems it is key that fishing pressure and impact be managed effectively. (See ABT 6 and Section II 1.3). Physical damage, siltation and reclamation are secondary issues but disproportionately impact reefs of critical habitat importance (See Section II 1.3).

It is estimated that Seychelles has some 1,700 km<sup>2</sup> of coral reef (Nevill *et al* 2015) with the vast majority occurring around the south western islands. Analysis of recent Vessel Monitoring System (VMS) data however, shows significant fishing effort throughout the Mahé plateau indicating that coral occurrence is far more extensive than thought and in particular in what were previously considered as the largely coral free mid-regions of the Mahé plateau.

Marine and coastal habitats were described in Seychelles' fourth national report to the Convention on Biological Diversity (GoS 2011) and updated and summarised in Seychelles National Biodiversity Strategy and Action Plan (NBSAP) 2015-2020 (Nevill *et al* 2015). This information has been reviewed and updated in Section VII 2 Tables 14-16. It is clear from the summary assessment that coral reefs and shallow marine ecosystems around the central archipelago and throughout the Mahé Plateau face two primary issues namely overfishing and the impacts of climate change; and secondary issues of physical damage/reclamation/siltation<sup>19</sup>.

Overfishing

It has been recognised since the late 1980s that the inshore demersal fishing grounds around the central archipelago were over-exploited (Lablache *et al* 1988). The strategic response to this was to encourage exploitation of the outer banks of the Mahé plateau which was assessed to have scope for further exploitation (e.g. Kunzel *et al* 1983). The 1998 national inshore fisheries management strategy (Mees *et al* 1998) maintained this assumption but, noting that the catch had declined since 1991, cautioned that the outer banks may have been sequentially depleted

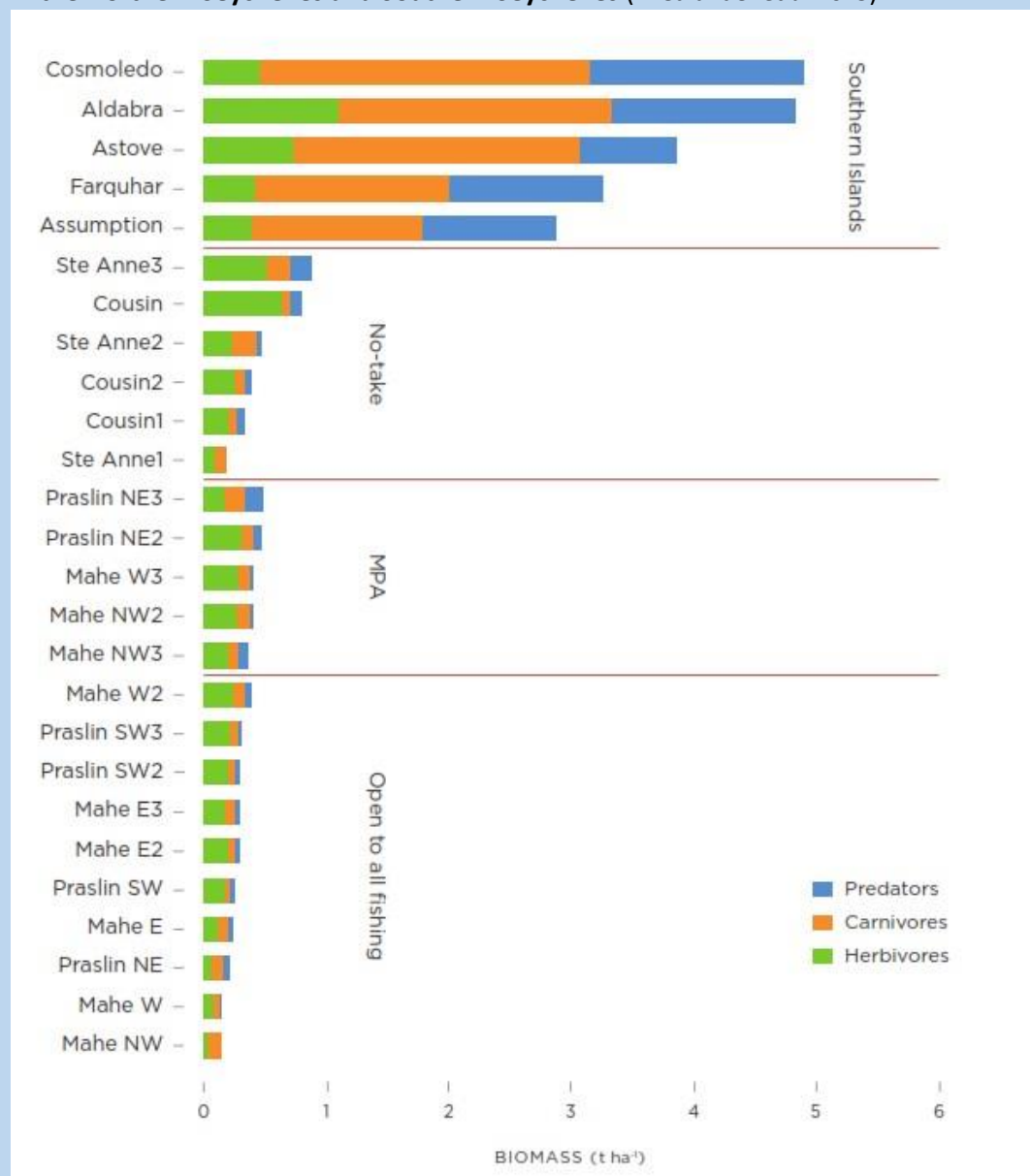
<sup>19</sup>The issue of oil exploration and extraction is not addressed in this report.

by the expanding geographic action of the fleet through time, giving the impression of sustainably maintained catch rates. If this was the case it stated a fundamental change in fisheries management approach may be necessary. Vessel monitoring data gathered by SFA has subsequently shown that the entire plateau is subject to fishing pressure indicating the declining catch trend reflects overfishing of the entire area. There is strong evidence to show that the Mahé plateau has been overfished for several decades. Fishery statistics show that the overall artisanal catch peaked in 1991 and has declined steadily since that time (**See Section II 1.3 Artisanal Fishery Figs 5 – 11**). Another excellent depiction of the depleted fishery stocks of the Mahé plateau, even within Marine Protected Areas<sup>20</sup>, is provided by **Friedlander *et al* 2015** who compared fish biomass on the isolated outer coral islands with those of the Mahe Plateau (see **Fig 15**).

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<sup>20</sup> The MPAs on the Mahe Plateau are typically too small to reap broader fishery benefits, typically only protecting species with very restricted ranges/territories.

**Fig 15: Comparison of Fish Biomass among Open Areas, Multi-use MPAs, and no take Reserves in the Northern Seychelles and Southern Seychelles (Friedlander *et al* 2015).**



Decline in catches will also have likely been exacerbated due to the extensive coral bleaching and death in 1998 that lead to bio-erosion and phase shift to a much less structurally complex and productive macroalgae dominated ecosystem in many former coral reefs (Engelhardt 2004, Graham *et al* 2007, Rogers *et al* 2014).

#### Fishing down the Marine Food Web

The marine food web of the Mahé Plateau has been “fished down”<sup>21</sup> (Pauly *et al* 1998) for well over a century<sup>22</sup>. The granitic islands originally supported populations of salt water crocodile and

<sup>21</sup>i.e. Resident and/or demersal high trophic level species have been fished to scarcity or extinction.

<sup>22</sup> **Fishing down the marine food webs** is defined as: “the process wherein fisheries within a given marine ecosystem, having depleted the large predatory fish on top of the food web, turn to increasingly smaller species, finally ending up with previously spurned small fish and invertebrates” (Pauly & Watson 2009).

2 species of seal were found on the smaller granite and more isolated islands of the central archipelago. The coral reefs teemed with fish, rays and sharks; and the beaches supported huge rookeries of hawksbill and green turtle which foraged on the reefs and seagrass beds respectively. The coastal environment today however is very different from that found by the first settlers in the 18<sup>th</sup> Century. Crocodiles and seals were early victims of human activity and were rapidly extirpated. Marine turtles supported prolonged exploitation that drastically reduced their occurrence and abundance. Marine turtles received full protection under the law in 1994 but poaching remains an issue and their nesting habitat is unprotected outside of protected areas. Sharks a vitally important component in marine ecosystems were dramatically reduced in abundance on the Mahé plateau by a targeted fishery in the 1940s-1960s and the populations on the smaller banks of the outer islands soon followed suit. The rising commodity value of shark fin has maintained fishing pressure and the downward trend in shark populations continues such that shark as a component of overall artisanal catch has declined by an order of magnitude over the last 80 years (see **Section II 1.3 Fig 9**). The Seychelles National Plan of Action for the Conservation and Management of Sharks 2007 (**SFA 2007**) characterised the shark fishery in general as “overexploited”.

Decline is also apparent in secondary predators and other high trophic level demersal species. This is particularly apparent in the decline of the occurrence, diversity and abundance of Serranidae with several species now very scarce or absent from the Mahé plateau catch. There has been a significant decline in Serranid catch (see **Section II 1.3 Fig 6**) not only in quantity but also as a proportion of the overall catch.

Serranids with their longer lifecycle and late maturity are less resilient to fishing pressure. It is worrying to note however that even the Brownspotted grouper (*Epinephelus chlorostigma*) the most abundant serranid in the catch and a relatively small grouper with lifecycle characteristics that should make it more resilient to fishing pressure, has actually declined more rapidly as a component of the catch than Serranidae in general presumably because of the effective targeting of its aggregations.

The removal of so many key species, entirely (extirpation) or functionally (numbers so reduced that they no longer fulfil their ecological role), and the progressive fishing down of the food chain has a destabilising effect on the ecosystem with likely impacts upon: future diversity, productivity, coral reef recovery from the 1998 major bleaching event and future reef resilience to climate change (**Jennings & Polunin 1996, Jackson et al 2001, Pandolfi et al 2003, Palumbi et al 2008, Sandin et al 2008, Stallings 2009, Hughes et al 2010, McClanahan et al 2012, Ruppert et al 2013, Brown & Mumby 2014, Roff et al 2016**).

#### ABT 10. Gender and Biodiversity

Women and men are engaged in all aspects of interaction with our ocean. A lot of programs and projects implemented by different organizations have targeted a broad range of stakeholders at all levels to empower each and every citizen to take care of the ocean and enable them to contribute towards transformative actions. A common message is that we have equal roles to play in safeguarding our ocean.

The identification of ecosystems that are vulnerable to climate change in the country has already been done.



Several organizations are leading coral reef restoration projects. The Marine Conservation Society Seychelles maintains a coral nurse on Cerf Island by 2 males and two female staff.

Terrestrial Restoration Action Society of Seychelles (TRASS) is leading forest restoration efforts by planting 15, 000 trees annually on Praslin Island whereby most of its mountain peaks have been destroyed by continuous forest fires. TRASS has more female volunteers compared to males.

Seychelles is leading the Commonwealth Blue Charter Action Group on Marine Protected Areas (MPAs). The country has made significant progress in ensuring its species and habitats of national and international importance are safeguarded in a network of marine and terrestrial protected areas. MEECC is the lead organization working on the action group and the team is mostly female.

Almost if not all organizations addressing pressures on vulnerable ecosystems such as coral reefs, mangroves etc. have equal participation of men and women.

Seychelles Intended Nationally Determined Contribution 2015 adopts a gender sensitive approach to climate change adaptation and will enable the country to attain the broader aspiration of the country's sustainable development goals. In addition it highlights the fact that Seychelles needs to build gender-sensitive capacity and social empowerment at all levels to adequately respond to climate change.

#### Indicators used in this assessment

Percentage live coral cover in reefs.

Evidence of overfishing.

Evidence of fishing down the food web.

or:

☐ No indicator used

#### Please describe any other tools or means used for assessing progress

Stakeholder input and agreement during national workshops.

#### Relevant websites, web links and files

See **Section II 1.3** and associated references.

Also reference section appended to this report.

#### Level of confidence of the above assessment

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

#### Please provide an explanation for the level of confidence indicated above.

There is significant information available on coral reefs in Seychelles but it cannot be considered as comprehensive.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☐ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

There is annual transect monitoring by various national agencies and NGOs as well as recurrent coral research by international Universities in partnership with local partners.  
National CORDIO reporting etc...

**Relevant websites, web links and files**(Please use this field to indicate any relevant websites, web links or documents where additional information related to the monitoring system can be found)

See **Section II 1.3** and associated references.

Also see the **References** section appended to this report.

**Target 11. By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.**

**Target 11.1. Terrestrial and Inland Water Areas.**

**Category of progress towards the implementation of the selected target:**

- ☒ On track to exceed target (Area)  
☒ On track to achieve target (Management<sup>23</sup>)  
☐ Progress towards target but at an insufficient rate  
☐ No significant change  
☐ Moving away from target  
☐ Unknown

**Date the assessment was done:** November 2018

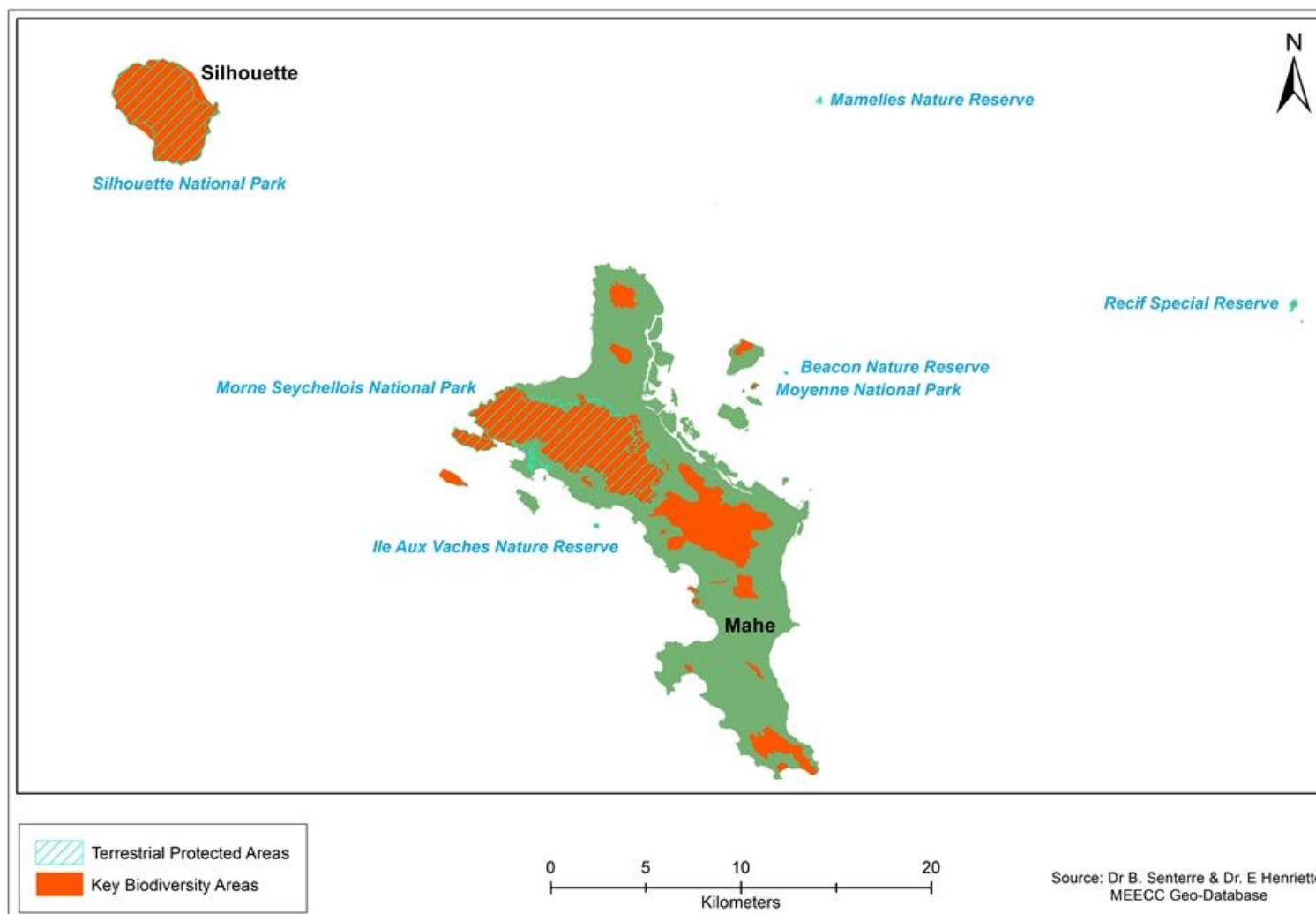
**Additional information.** This a complex and multifaceted question. In terms of area Seychelles has long exceeded the target, currently some 47% of Seychelles terrestrial land mass is protected for environmental reasons, with another 4% identified and scheduled for designation. The factors of ecosystem service, ecological representativeness, and effective and equitable management are different matters however.

<sup>23</sup> See proviso to this score in section b of Additional Information below.

a). Ecosystem Services. The process to protect terrestrial ecosystem services and in particular the water cycle was initiated by the 1903 State (formerly Crown) Land and River Reserves Act (**GoS 1903**). This created reserves around some 146 rivers and streams, on the main islands of the central archipelago, where vegetation was to be left intact. This reflected the severely deforested nature of the islands at that time and concerns about water sources drying up. A shift in the economy of the islands from an agrarian base to one of service industries and fisheries commencing in the mid-20<sup>th</sup> century saw a steady increase in secondary forestry cover and this was further secured by the designation of two National Parks, namely the Morne Seychellois (GoS 1979) and Praslin (GoS 1979a) National Parks respectively (see **Section II 1.5 Maps 5 & 6**). The protection of these upland areas has been effective in securing, to a great extent, the key ecosystem services of the soil and water cycles on the two main populated islands in the country.

b). Ecological Representativeness. The terrestrial national parks were originally selected for the purposes of environmental and biodiversity protection but on an ad-hoc, and often opportunistic, basis rather than in the context of a comprehensive assessment of Seychelles' biodiversity distribution and conservation needs. Senterre *et al's* (2013) biodiversity assessment that built upon various preceding sectoral analyses (*inter alia* **Carlstrom 1996 & 1996a, Duncombe 1996 & 1996a, Friedmann 1986 and Robertson 1989**) and his own data review (**Senterre 2010**) and gap analysis (**Senterre 2010a**) has provided a sound basis with which to assess the current coverage of key Biodiversity Area by the PAN in the central archipelago and how it might be altered in the future to improve ecological representation (e.g. **Map 23 overleaf**).

Map 23. Key Biodiversity Areas and Protected Area Coverage in the Mahé Group and Silhouette Island



A notable shortcoming in this respect is that of lowland wetlands, recognised as the most threatened habitat type in Seychelles (Nevill *et al* 2015), it is estimated that more than 90% of lowland wetlands have been lost since colonisation by man in 1770, and many that remain are fragmented and otherwise degraded (see **ABT 5 Inland Waters** for further information). The recent blocking of a development proposal for the Grande Police wetland system and the Government's stated intent to designate the area a National park is a major step forward to incorporate into the PAN perhaps the single most important remaining lowland wetland in the country.

c). Effective Management. Effective management to meet identified conservation objectives has always been problematic in Seychelles. Some small island protected areas (notably Aride Island Special Reserve and Cousin Island Special Reserve) are internationally recognised as exemplars of excellent management. Likewise in the last 20 years several private islands have undertaken successful IAS and ecosystem rehabilitation programmes, realising significant conservation success stories and operating now as private PAs. On a larger island the Nature Reserve of Vallee-de-Mai is also considered to be managed very effectively. The larger areas have always proven much more difficult to manage. The key area for endemic biodiversity interest in Seychelles lies between 200-500m elevation on the principal granitic islands. The terrain is typically very demanding and the vegetation often near impenetrable to human management activities, but offers little or no impediment to the ongoing incursion and spread of IAS which represents the primary threat to the endemic biodiversity. Nationally Seychelles has neither the resources, personnel nor the techniques to address these problems at the time of reporting. The other main protected area constituting over 30% of Seychelles total landmass is the Aldabra Atoll. Aldabra is one of the most isolated locations on the planet and lies over 1,100km from the principal island of Mahé. Therefore posing huge logistical difficulties to its management. The Seychelles Island Foundation, which manages Aldabra, has over the last 10 years however greatly reinforced and enhanced its management capacity and efforts, complemented by great progress in its scientific research to support informed management initiatives. This coupled with several highly successful IAS eradication project in recent years has resulted in an IUCN global assessment on management rating the management of Aldabra as "Highly Effective". This score pertaining as it does to such a large proportion of the country's surface area results in a score of on track to achieve the target as it pertains to effective management, with the note of concern about the key 200-500m asl zone for endemic biodiversity on the islands of Mahé and Silhouette.

#### ABT 11. Gender and Biodiversity.

E-NGOS are creating an environment where women and men conservation professionals stand on equal ground and thrive. We all depend upon the natural resources for survival, therefore biodiversity conservation involved every stakeholder.

Protected area management is done by both men and women. The Seychelles National Park Authority has 4 women and 7 men working in the National Parks. There are 7 males and 3 females working on Aldabra. 12 males and 10 females work on Aride.

#### **Indicators used in this assessment**

Percentage of Seychelles landmass designated as protected areas.

Percentage of landmass identified for promulgation and in process - including boundary changes to better incorporate key biodiversity areas identified by Senterre *et al* 2013.

Management effectiveness scores from protected areas project.

Changing area of lowland wetlands through time.

or:

☐ No indicator used

**Please describe any other tools or means used for assessing progress**

Stakeholder discussion and agreement during National Stakeholder workshops.

**Relevant websites, web links and files**

See reference section at end of this report for documents cited above.

**Level of confidence of the above assessment**

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

Evidence and thus confidence is good in general, with the exception being a lack of data pertaining to the impact of IAS and its trend on Biodiversity in the 200-500m asl on the islands of Mahé and Silhouette.

**Adequacy of monitoring information to support assessment**

☐ Monitoring related to this target is adequate

☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☐ No monitoring system in place

☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

Management effectiveness assessments have been undertaken for all protected areas during the reporting period under the auspices of the UNDP-GEF Protected Areas Financing project.

**Relevant websites, web links and files**

N/A

**Target 11. By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.**

**Target 11.2. Coastal and Marine Areas.**

**Category of progress towards the implementation of the selected target:**

- ☒ On track to exceed target (Area)
- ☐ On track to achieve target
- ☒ Progress towards target but at an insufficient rate (Management)
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information**

The Seychelles Marine Spatial Planning Initiative (See **Section II 1.4**) has meant that Seychelles has significantly surpassed the target for coastal and marine areas in all aspects except for that of effective management. This because in 2018 Seychelles marine protected area increased from 0.04% of marine area to 15%. Such a vast increase requires an equivalent increase in management capacity and this will take some considerable time to realise. The process has begun to address this with the stakeholder elaboration of a governance structure for submission to government.

In the meantime the management of, by far, the largest pre-existing MPA of Aldabra Atoll has recently been assessed as 'Highly effective' by an IUCN global assessment.

**ABT 11. Gender and Biodiversity**

Seychelles has a long history of conservation and management measures in place. The guiding principles of the Seychelles Marine Spatial Plan includes transparency, inclusivity and participation of all stakeholders and decisions made in the interest of the whole community and not any one group.

The MSP Policy seeks "To support a healthy productive marine environment, local communities and the development of the Blue Economy through improved and integrated management for conservation, sustainable use and ecosystem resilience. 13 men and 13 women were involved in the Stakeholder Consultation Workshop to Review the Draft MSP Policy back in 2017. In another workshop to Define Governance Arrangements for the Seychelles Marine Spatial Plan 18 men, 13 women attended. This MSP process is led by a female project Manager.

**Indicators used in this assessment**

Area of waters designated as protected under Seychelles law is 15%.

The process to declare another 7.5% as protected has begun and it is intended that in total 30% will be protected by 2020 (See MSP Initiative in **Section II 1.4**).

or:

☐ No indicator used

**Please describe any other tools or means used for assessing progress**

IUCN assessments of management effectiveness in MPAs.

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

1). Seychelles Marine Spatial Plan Website. <https://seymsp.com/>

**Level of confidence of the above assessment**

☒ Based on comprehensive evidence

☐ Based on partial evidence

☐ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

The new marine protected areas have been identified through a process of best current practice in terms of consultation and inclusion of representative biodiversity (**Section II 1.4**). The process to develop national capacities to manage these areas has been initiated.

**Adequacy of monitoring information to support assessment**

☒ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☐ No monitoring system in place

☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

See criteria above and full details of Seychelles marine spatial planning initiative in **Section II 1.4**.

**Relevant websites, web links and files**

The overall process of Marine Spatial Planning Initiative is described in detail on its website: <https://seymsp.com/>



**Target 12. By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☐ On track to achieve target
- ☒ Progress towards target but at an insufficient rate (**Terrestrial**)
- ☒ No significant change (**Marine**)
- ☐ Moving away from target
- ☐ Unknown

As per the scoring above it was decided to treat this question separately for terrestrial and marine biodiversity respectively, as the circumstances and progress are quite distinct.

**Date the assessment was done:**

**November 2018**

**Additional information** (Please provide information on the evidence used in the assessment of this target, drawing upon relevant information provided in section II, including obstacles in undertaking the assessment).

Terrestrial Threatened Species

Seychelles has made outstanding progress in the conservation of threatened endemic bird species with positive trends and population recoveries ongoing (see **Section II 1.7 Table 6, Fig 13 and Case Studies 3-5**).

Aldabra Atoll Special Reserve and UNESCO world heritage site which constitutes approximately third of the entire landmass of Seychelles is effectively managed and harbours diverse rare and threatened species not least a population of some 100,000 Giant tortoises (*Aldabrachelys gigantea*).

Significant progress has been made in the protection of Seychelles endemic palms, including the endangered Coco-de-mer (*Lodoicea maldivica*)

In contrast however, and as previously mentioned under ABTs 9 (IAS) and 11 (Protected Areas), the status and trends of much of Seychelles terrestrial endemic biodiversity (i.e. that occurring between 200 and 500 m elevation on the islands of Mahe and Silhouette) is unclear. It can however be reasonably assumed that the situation is poor and worsening due to ongoing IAS incursion and impact. An issue for which the finances, personnel and technical capacity to address it are currently lacking, not least because of the difficult terrain and dense vegetation.

Marine Threatened Species

Seychelles has realised notable successes with some key marine turtle populations (namely Aldabra and Cousin island) but this reflects the effective protection of their terrestrial rookeries. There are, however, initial indications that populations on some uninhabited islands may also be starting to increase. On populated islands issues of poaching and disturbance remain prominent and the outlook is not good (see **Section II 1.7**).

Seychelles has a small but growing Dugong (*Dugong dugon*)(IUCN VU) population fully protected at Aldabra atoll.

There are however significant shortcomings in Seychelles management of numerous marine threatened species (see **Section II 1.3 & 1.7**) and its implementation of its international commitments in this regard (See **Section II 1.1**)

Chondrichthyans likewise remain a major concern with Threatened species regularly landed, datasets showing ongoing decline and implementation of the Seychelles National Plan of Action for the Conservation and management of Sharks limited.

#### ABT 12. Gender and Biodiversity

Men and women are almost equally active when it comes to biodiversity conservation. From the implementation of key conservation projects to working to policy making, contributions have been observed from both genders.

Women are proving themselves as experienced leaders and strong field workers against many challenges female conservationists/scientists have to face. A lot of E-NGOs are encouraging women to apply for Jobs within their organizations e.g. SIF, Nature Seychelles.

There are in place committees set up to provide oversight and advice on the conservation of threatened species for example: The Seychelles Magpie Robin Steering Committee chaired by Nature Seychelles has 7 members, 3 men and 5 women. The Turtle Action Group Seychelles consists of 5 females and 4 males (Board of Trustees). The chairperson is a woman.

Men are particularly strong candidates when applying for certain consultancies that involve work with threatened species and or their habitats. For example for 2019- 2020, more men applied for the MEECCs annual endangered species census (3 men and 1 woman).

#### **Indicators used in this assessment**

*Indicator(s) used in this assessment*

Populations and status of endemic threatened bird species (see **Section II 1.7**)

Data on standing population of Coco-de-Mer palms and nut production.

Catch trends in threatened marine species subject to the Artisanal fishery.

or:

☐ No indicator used

#### **Please describe any other tools or means used for assessing progress**

National Stakeholder workshops and consultations.

#### **Relevant websites, web links and files**

**See Section 11 1.7**

#### **Level of confidence of the above assessment**

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

#### **Please provide an explanation for the level of confidence indicated above.**

There are significant aspects of endemic and threatened species status and trends for which there is not data available.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☐ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

Various agencies are involved in the monitoring of the status of threatened bird species, governmental, NGO and private sector. In the case of the Seychelles magpie robin these are coordinated by national stakeholder body (SMART).

Total rookery and nesting data is collected by some 17 agencies nationally there was formerly a centralised database but this has fallen moribund in recent years.

There is no national monitoring of threatened species in the artisanal fishery. The Green Islands Foundation (NGO) has undertaken project in this regard 2017-2018 and identified 23 threatened species currently being legally caught in the fishery. A private operator maintains a longer-term (2012- onwards) database on the artisanal fishery and has recorded 25 threatened species being caught legally in the artisanal fishery.

**Relevant websites, web links and files**

Endemic Bird Species (Nature Seychelles). <http://www.natureseychelles.org/knowledge-centre/seychelles-wildlife-2/endemic-bird-species>

Seychelles Magpie Robin recovery Team (SMART). <http://www.natureseychelles.org/what-we-do/54-what-we-do/conservation-networks/80-smart-seychelles-magpie-robin-recovery-team>

Seychelles Biodiversity Clearing House Mechanism. <http://www.seychellesbiodiversitychm.sc>

GIF Threatened species project. <http://gef-satoyama.net/subgrantprojects/gif/>

Dugong reports. <https://www.cms.int/dugong/en/country/seychelles>

Seychelles Seatizens website. [www.seatizens.sc](http://www.seatizens.sc)

Also See **References** section.

**Target 13. By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☒ On track to achieve target  
☐ Progress towards target but at an insufficient rate  
☐ No significant change  
☐ Moving away from target  
☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information**

Seychelles is not a centre for agro-biodiversity and there are no endemic species in mainstream production. Human history of Seychelles is also a relatively short 250 years, as such the development of varieties adapted to local conditions is somewhat limited. In recent years farming production has been almost entirely overhauled by introduced hybrid varieties that have proven to be more productive in and tolerant of local conditions than the traditional local varieties. Efforts have been made however to preserve the diversity of local varieties in light of the fact that many of them are no longer in mainstream production. There is a centre set aside for the cultivation of these local varieties (Beoliere, Grand Anse, Mahe) and many are also propagated in the national biodiversity centre at Barbarons. There is also an active garden farming scheme where many local producers maintain the less used varieties in back garden allotments. In light of this it is considered that adequate measures have been undertaken to retain the genetic diversity of local varieties that were used in the past in agricultural production. There are also efforts to produce various indigenous plants that are considered to have traditional medicinal usages at the botanical Gardens, the national biodiversity centre and in the allotments of local practitioners.

**Indicators used in this assessment**

Number of local varieties preserved in national centre, the Val D'endorre project and in private allotments.

or:

☐ No indicator used

**Please describe any other tools or means used for assessing progress**

General information and specific data is not available on this target. There is no overarching database or spreadsheet dealing with these issues. This largely reflects the limited administrative capacity and multiple responsibilities of the Agriculture Department and the Seychelles Agricultural Agency. Information was therefore gathered through direct interviews with senior staff from both agencies. This also provided additional contacts for technical input on specific projects in this domain who were in turn subsequently interviewed for additional information.

**Relevant websites, web links and files**

Ministry of agriculture and fisheries: <http://www.mofa.gov.sc/>  
 Seychelles agricultural agency: <http://www.mofa.gov.sc/agency-saa.html> & <https://www.facebook.com/SeychellesAgriculturalAgency>

**Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence  
☒ Based on partial evidence  
☐ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

See text above.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☐ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

Various centres and projects retain information of species maintained but this is not formalised and there is no central national database.

**Relevant websites, web links and files**

N/A

**Target 14. By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☒ On track to achieve target (Terrestrial)  
☐ Progress towards target but at an insufficient rate  
☒ No significant change (Marine)  
☐ Moving away from target  
☐ Unknown

Stakeholders agreed to divide this target into terrestrial and marine aspects, as the progress towards the target differs quite considerably between the two.

**Date the assessment was done:**

November 2018

**Additional information.**

The historical exploitation of forests and its impacts were covered in detail in Seychelles 4th National report. In terms of essential ecosystem services management of the terrestrial domain has been highly successful in restoring and safeguarding the soil and water cycles which are so important in small islands ecosystems particularly those with steep topographic relief. The water catchments on the two main populated islands of Mahé and Praslin have been effectively restored and maintained in large part by natural reforestation due to change in land use patterns through the early and mid-20th century and subsequently by the designation of large national parks. The same is true for the soil cycle (see **Section II 1.8 maps 5-8**). Mahé has been more successful than Praslin the key factor here being that Praslin is typically drier for longer periods

and has been repeatedly prone to forest fires leading to loss of vegetation and subsequent soil erosion.

Information pertaining to other habitat types notably Inland waters and the lowland scrub of coral atolls is covered in detail in **Section II 1.8**.

In the marine context the primary essential service is of course fisheries. In this sense therefore it again relates to a significant extent to coral reefs and live coral cover – these topics have been covered in depth in **Section II 1.3** and **Section III ABTs 6 & 10**.

#### ABT 14. Gender and Biodiversity

Ecosystem Based Adaptation to climate change in Seychelles project has a Gender Action Plan 2019-2021. Some of the activities included is to conduct certified trainings targeting women in communities for example women on the watershed committee and encourage women to apply for project consultancies.

There were 122 consultancies done for the EBA project by January 2019, 112 male and 10 females were recorded (PCU, 2019).

2 out of the 4 watershed committees have female chair persons. For example the Baie Lazare committee contains 7 men and 6 women, the Caiman Committee 8 men 6 women. The Mont Plaisir Committee contains 10 females and 3 males (EBA Project, 2018).

The Seychelles Wetland Policy and Action Plan 2019-2022 empowers all stakeholders to contribute to the conservation and sustainable use of wetlands.

#### **Indicators used in this assessment**

Change in percentage forest cover through time on main populated islands.

Increase in protected area coverage of catchments through time.

Area of low land wetlands rehabilitated.

Declining artisanal catch through time.

Declining live coral cover through time.

or:

☐ No indicator used

#### **Please describe any other tools or means used for assessing progress**

Historical accounts and photographs of vegetation cover.

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

<Add link><Add file>

#### **Level of confidence of the above assessment**

☒ Based on comprehensive evidence (**terrestrial**)

☒ Based on partial evidence (**marine**)

☐ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

Historical accounts, photographs and other information related to forest cover and the subsequent designation of extensive protected areas provide comprehensive evidence with regard to terrestrial ecosystem services.  
Coral reef surveys are based upon limited site monitoring which is then extrapolated to provide an overview.

#### Adequacy of monitoring information to support assessment

- ☒ Monitoring related to this target is adequate (**terrestrial**)  
☒ Monitoring related to this target is partial (**marine**)  
☐ No monitoring system in place  
☐ Monitoring is not needed

#### Please describe how the target is monitored and indicate whether there is a monitoring system in place

Historical accounts, photographs and other information related to forest cover and the subsequent designation of extensive protected areas provide comprehensive evidence with regard to terrestrial ecosystem services.  
Coral reef surveys are based upon limited site monitoring which is then extrapolated to provide an overview.

#### Relevant websites, web links and files

**Target 15. By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks have been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.**

#### Category of progress towards the implementation of the selected target:

- ☐ On track to exceed target  
☐ On track to achieve target  
☒ Progress towards target but at an insufficient rate (**Ecosystem resilience**)  
☒ No significant change (**Carbon sinks**)  
☐ Moving away from target  
☐ Unknown

Stakeholders

#### Date the assessment was done:

November 2018

#### Additional information

There is no reason to believe that there has been any significant change in terms of enhancing carbon sinks during the reporting in particular because of the typically very small areas that are referred to.

In the terrestrial domain there has been significant work undertaken with regard to enhancing ecosystem resilience – this reflect various issues *inter alia* rehabilitation of small island ecosystems (including through IAS eradication and re-planting), wetlands and hillsides (see **Section II 1.8** for details). There has also been the longer ongoing trend of secondary forest and scrub regeneration occurring on many islands. Recent research also indicates broad terrestrial ecosystem recovery and enhanced resilience on Aldabra Atoll which constitutes a little over a third of the country's landmass (see **Section II 1.8**).

In the marine domain the primary activity that offers scope for enhancing marine ecosystem resilience is the reduction of overfishing, this however still remains an objective (see Section II 1.3 and Section III ABT 6) rather than an achievement.

There has over the last 20 years been a recovery of mangrove and muddy substrate habitats along much of the east coast of the principal island of Mahé. Following the creation of lagoons by the different phases of reclamation (see **Map 1 Section II 1.3**). These habitats were naturally present when man first colonised the islands and so this can be reconsidered a recovery/enhanced resilience and a contribution to carbon sinks, but the area is too small to be significant in the latter case.

There have also been three main coral reef gardening/restoration projects ongoing nationally which have produced and planted out tens of thousands of coral nubbins and are seeking to propagate species that show resistance to bleaching in local conditions. The question here is again one of the relatively small area affected and whether there is scope for scaling up operations in the future.

#### Indicators used in this assessment

Percentage (in terms of overall area) of small island ecosystems restored in central archipelago.

Trends in forest cover on main islands.

Percentage of lowland wetlands rehabilitated.

Numbers of coral nubbins produced and planted/area of coral reef replanted.

or:

☐ No indicator used

#### Please describe any other tools or means used for assessing progress

N/A

#### Relevant websites, web links and files

See links in **Section II parts 1.3 & 1.8**

#### Level of confidence of the above assessment

☐ Based on comprehensive evidence



<input type="checkbox"/> Based on partial evidence <input checked="" type="checkbox"/> Based on limited evidence
<b>Please provide an explanation for the level of confidence indicated above.</b> The indicators described are limited in scope and scale.
<b>Adequacy of monitoring information to support assessment</b> <input type="checkbox"/> Monitoring related to this target is adequate <input type="checkbox"/> Monitoring related to this target is partial (e.g. only covering part of the area or issue) <input checked="" type="checkbox"/> No monitoring system in place <input type="checkbox"/> Monitoring is not needed
<b>Please describe how the target is monitored and indicate whether there is a monitoring system in place</b> N/A. <b>Relevant websites, web links and files</b> N/A

<b>Target 16. By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.</b>
<b>Category of progress towards the implementation of the selected target:</b> <input type="checkbox"/> On track to exceed target <input checked="" type="checkbox"/> On track to achieve target <input type="checkbox"/> Progress towards target but at an insufficient rate <input type="checkbox"/> No significant change <input type="checkbox"/> Moving away from target <input type="checkbox"/> Unknown
<b>Date the assessment was done:</b> November 2018
<b>Additional information</b> Seychelles as part of the GEF-UNDP Global ABS Project benefited from both financial and technical assistance to develop its policy and legislative framework. A National Access and Benefit Sharing Policy was developed through extensive stakeholder input and review and was launched in 2018.

**ABT 16 and Gender**

Seychelles became the fourth country to ratify the Nagoya Protocol in 2012. Women's participation in ABS issues has been key. The country launched its ABS policy in 2018. The Focal point for ABS is male whilst the National Project Coordinator for the ABS project is female. Most consultants who worked on ABS guidelines, scoping either National or international were women.

Within MEECC, Women lead the approval process for providing access to genetic resources in Seychelles as well as negotiating Mutually Agreed Terms (MATs).

There is now and more women in local communities and community based organisations working on ABS and environmental issues such as in farmer's associations, herbalist grouping, culture and associated traditional knowledge based groupings, etc...

**Indicators used in this assessment**

*Indicator(s) used in this assessment*

- National Policy for ABS established
- National Act and subsidiary legislation

**Please describe any other tools or means used for assessing progress**

The Seychelles used the global ABS project to review many of its existing administrative measures, and despite having the main indicators (above) a lot of emphasis was put on monitoring the process. For example the process of stakeholder engagement in the formulation of the policy, establishment of the national ABS committee, involvement of local communities representatives and culture folks in the planning of the ABS policy, etc...

**Relevant websites, web links and files**

**Seychelles country profile and information on ABS under the Global ABS Project:** <https://abs-sustainabledevelopment.net/country/seychelles/>

**Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence
- ☒ Based on partial evidence
- ☐ Based on limited evidence

**Please provide an explanation for the level of confidence indicated above.**

Many of the activities are ongoing and hence why at the time of reporting only some of the evidence is available.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate
- ☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
- ☐ No monitoring system in place
- ☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

Monitoring is done through the competent authority and is currently only administrative given the fact that the legal framework is not yet finalised. Under the draft legal framework being designed there are key compliance, checks and balances that have been introduced

**Relevant websites, web links and files**

N/A

**Target 17. By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☒ On track to achieve target
- ☐ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information**

Seychelles Government approved its second generation NBSAP 2015-2020 late 2014. The NBSAP was developed in a participatory, multi stakeholder, bottom-up approach which took over two and half years to finalise. The NBSAP presents 31 projects that cut across several sectors that affect biodiversity in the Seychelles, including Fisheries, Agriculture, Land Use Planning, Biosecurity and

data management. At the time of reporting Seychelles had over 50% implementation of the projects (most ongoing and with a few in the pipelines). A more comprehensive review of the success of implementation of the NBSAP will be done at the end of 2020 (end of term of the plan).

#### NBSAP and Gender

Seychelles is one of the 67 countries with no distinct mention of gender and or women keyword in its NBSAP. The country does however recognize biodiversity as a crosscutting socio-economic issue and therefore has a broad and complex stakeholder community.

The NBSAP steering committee membership comprised of 7 women and 12 men and contributors to the overall process involved 47 men and 33 women.

Seychelles has made remarkable improvement in terms of gender reporting, considerations etc. since the development of the 2nd NBSAP. The Gender and Biodiversity Report has been compiled for the first time and will enable gender issues to be included in future CBD and other reporting.

#### **Indicators used in this assessment**

*Indicator(s) used in this assessment*

*The indicators used were those provided in the NBSAP (See reference link below)*

- **NBSAP developed**
- **Percentage implementation of the NBSAP**

#### **Please describe any other tools or means used for assessing progress**

Indicators were provided for each of the 31 projects in the NBSAP and these are the main tools being used for assessing progress.

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

**NBSAP Document:** <http://www.meecc.gov.sc/wp-content/uploads/2017/04/National-Biodiversity-Action-Plan-2015-2020.pdf>

#### **Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence
- ☒ Based on partial evidence
- ☐ Based on limited evidence

#### **Please provide an explanation for the level of confidence indicated above.**

Many of the projects are still ongoing.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate
- ☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
- ☐ No monitoring system in place
- ☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

There was limited capacity in the Ministry in the first half of the NBSAP period (i.e from 2015-early 2018). In June 2018, a National NBSAP partnership forum was set up and some funds were set aside for coordination of the NBSAP. The main role of the NBSAP partnership forum is to bring together all relevant stakeholders and partners who are responsible on delivering key project/programme outcomes under the NBSAP. Togetehr this platform became the main monitoring and review system for NBSAP implementation.

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to the monitoring system can be found)

**Link to Seychelles NBSAP :** <http://www.meecc.gov.sc/index.php/downloads-adverts/>

**Target 18. By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target
- ☒ On track to achieve target
- ☐ Progress towards target but at an insufficient rate
- ☐ No significant change
- ☐ Moving away from target
- ☐ Unknown

<p><b>Date the assessment was done:</b></p> <p><b>November 2018</b></p>
<p><b>Additional information</b></p> <p>Seychelles does not have indigenous peoples, but as a small country it endeavours to fully recognise the local communities where they are present and the traditional knowledge that they hold.</p>
<p><b>Indicators used in this assessment</b></p> <p><i>Indicator(s) used in this assessment</i></p> <p><b>-Establishment of Biocommunity Protocol</b></p>
<p><b>Please describe any other tools or means used for assessing progress</b></p> <p><b>1. Local communities are involved in decision making on the conservation and sustainable use of resources</b></p> <p><b>2. Establishment of protocol for local community engagement particularly on ABS issues (bio-community protocol)</b></p>
<p><b>Relevant websites, web links and files</b> (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).</p> <p><b>N/A</b></p>
<p><b>Level of confidence of the above assessment</b></p> <p><input type="checkbox"/> Based on comprehensive evidence</p> <p><input type="checkbox"/> Based on partial evidence</p> <p><input checked="" type="checkbox"/> Based on limited evidence</p>
<p><b>Please provide an explanation for the level of confidence indicated above.</b></p> <p>This is all very new , and through the GEF-UNDP Global ABS project have only now started reviewing and collecting key information that will allow the country to monitor this more closely.</p>
<p><b>Adequacy of monitoring information to support assessment</b></p> <p><input type="checkbox"/> Monitoring related to this target is adequate</p> <p><input checked="" type="checkbox"/> Monitoring related to this target is partial (e.g. only covering part of the area or issue)</p> <p><input type="checkbox"/> No monitoring system in place</p>

☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

**N/A**

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to the monitoring system can be found)

**N/A**

**Target 19. By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☐ On track to achieve target  
☒ Progress towards target but at an insufficient rate  
☐ No significant change  
☐ Moving away from target  
☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information**

The National Institute of Science, Technology and Innovation (NISTI) was founded in 2014. Its objectives and functions include:

- ensure the resources which shall support the development of science, technology and innovation;

- collaborate with international research institutions, business enterprises, and national expertise in developing a competent regional knowledge cluster in science, technology and innovation;
- improve the awareness within the industrial and service sectors of the importance of intellectual property rights;
- devise strategies to promote education and human capital in science, technology and innovation
- promote science, technology and innovation
- approve and coordinate scientific research programs and activities at national level
- ensure collaboration and cooperation between organisations engaged in science, technology and innovation to minimise duplication of functions and inter-organisational conflicts.
- Take measures for protection of intellectual property rights of persons making research and innovation and advise the government from taking any policy and legislative measures;
- maintain and publish scientific literature and research, carried out locally;
- develop and promote indigenous knowledge and technologies;
- ensure that development in science, technology and innovation is people centred as well as environment centred for the sustainability of the country's overall development;
- establish a research and development centre to support science, technology and innovation.

In 2018, NISTI announce the establishment of a knowledge management platform - with the professed objective of ensuring that research outcomes, reports and meta data in Seychelles are curated, documented, archived and available for access to all researchers, as well as science, technology and innovation stakeholders at national, regional and international levels.

Other key governmental agencies that store and maintain data relevant to this target are, in no particular order, Seychelles Fishing Authority, National Bureau of Statistics, Seychelles Bureau of Standards, the National Archives, Ministry of Environment, Energy and Climate Change (MEECC), the UNDP/MEECC Project Coordination Unit and the Seychelles Island Foundation.

In the NGO sector there are several agencies that maintain important databases notably but not limited to: Nature Seychelles, Marine Conservation Society Seychelles, Island Conservation Society, Save Our Seas Foundation (Darros) and the Green Islands Foundation.

Finally there are several private individuals with unique knowledge and important databases that are national assets whose information has yet to be mainstreamed. .

There is no doubt that the knowledge base has expanded considerably in this current reporting cycle in many cases driven by GEF funding and now beginning also to be driven by the nature for debt swap mechanisms. Certain agencies have excelled in publication notably SIF in recent years. Where Seychelles falls short currently is in the sharing, transferring and application of this knowledge. We have examples of data sharing agreements which set out to protect intellectual property rights but it is as yet unclear how successful these will prove to be.

Certainly the accessibility of information is often limiting this has been very apparent during this reporting process. Often datasets that are reported as existing can no longer be found, or they are not retained and formatted in a manner that is readily usable.

With regard to civil society agencies and individuals that hold datasets, there is a lot of important information that is not shared or available, and existing data sharing agreement models do not



appear to appeal to these agencies. This is very difficult when funding and resources utilised to gather information have been done entirely privately by the agencies or individuals in question.

#### Indicators used in this assessment

Number of national biodiversity -related databases and datasets accessible to the public.

Number of data-sharing agreements.

Number of scientific publications from Seychelles organisations through time

Number of websites with national statistical reports related to biodiversity open to public access.

Number of biodiversity -related databases which are private and not accessible.

#### Please describe any other tools or means used for assessing progress N/A

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

National Institute of Science, Technology and Innovation act 2014

<https://seylil.org/sc/legislation/act/2014/6-0>

Ministry of Environment, Energy and Climate Change. <http://www.meecc.gov.sc/>

Seychelles biodiversity clearinghouse mechanism. <http://seychellesbiodiversitychm.sc/>

UNDP program coordination unit. <http://www.pcusey.sc/>

Seychelles Fishing Authority. <http://www.sfa.sc/>

Seychelles Islands Foundation. <http://www.sif.sc/>

National bureau of statistics. <https://www.nbs.gov.sc/>

Seychelles bureau of standards. <https://sbs.sc/>

Nature Seychelles. <http://www.natureseychelles.org/home>

Marine conservation Society, Seychelles. <http://www.mcsc.sc/>

Island Conservation Society. <https://www.islandconservationseychelles.com/>

Green Islands Foundation. <https://greenislandsfoundation.blogspot.com/>

Save our Seas foundation, D'arros research centre. <https://saveourseas.com/sosf-darros-research-centre/>

Plant Conservation Action group. <http://www.pcaseychelles.org/>

Sustainability for Seychelles. <http://www.s4seychelles.com/>

#### Level of confidence of the above assessment

☒ Based on comprehensive evidence

☐ Based on partial evidence

☐ Based on limited evidence

#### Please provide an explanation for the level of confidence indicated above.

Seychelles is a small country where the agencies involved in biodiversity research data collection management or retention are well known. Hence the listing of sources of information and the limitations on national information sharing are well understood.

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate  
☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)  
☒ No monitoring system in place  
☐ Monitoring is not needed

**Please describe how the target is monitored and indicate whether there is a monitoring system in place**

There is no monitoring system in place.

**Relevant websites, web links and files**

N/A

**Target 20. By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.**

**Category of progress towards the implementation of the selected target:**

- ☐ On track to exceed target  
☒ On track to achieve target  
☐ Progress towards target but at an insufficient rate  
☐ No significant change  
☐ Moving away from target  
☐ Unknown

**Date the assessment was done:**

**November 2018**

**Additional information** (Please provide information on the evidence used in the assessment of this target, drawing upon relevant information provided in section II, including obstacles in undertaking the assessment).

#### DEBT SWAP, BLUE BONDS and SEYCCAT

The Seychelles has invested a lot of effort in the establishment of innovating financing mechanism to support biodiversity conservation and sustainable use of resources in the country. In 2012, at the Rio+20 United Nations Conference on Sustainable Development, the Republic of Seychelles took a decision to commit to protect 30% of the Exclusive Economic Zone by 2020. This was the beginning a long negotiation process that set Seychelles in its current course of actions. In 2014, Seychelles co-led the Abu Dhabi Declaration for the Blue Economy, a vision for shared responsibilities to use the ocean space for new opportunities, protect areas to improve biodiversity conservation, climate change adaptation, and provide increased food security. In April 2016, Seychelles completed the world's first debt conversion for ocean conservation and climate change and created the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT). SeyCCAT mobilizes funding for conservation, development of blue economy and climate change adaptation using grant-funding mechanism. The main source of funding in the SEYCCAT is the Debt Swap.

Also as part of this new financing system and to support the transition to a Blue economy Seychelles issued the first ever Sovereign Blue Bond in 2018. This is a 15million USD bond and the proceeds are to be used for three main objectives:

- *Expanded sustainable-use marine protected areas*: investments in planning, implementing and enforcing the planned expansion of areas within the Seychelles' exclusive economic zone subject to restrictions on fishing;
- *Improved governance of priority fisheries*: investments in finalising key fisheries management plans and building the institutional capacity to implement those plans; and
- *Sustainable development of the blue economy*: investments in developing greater value addition from the aquaculture, industrial, semi-industrial and artisanal fishing and processing sectors.

Two bodies administer the proceeds of the blue bond, Firstly, US\$3 million managed by the SeyCCAT to provide grants and the Development Bank of Seychelles (DBS) to provide loans to businesses/individuals in blue economy sector. The main beneficiaries are Seychellois whose livelihoods depend on marine resources and the ocean. This includes artisanal and semi-industrial fishers, operators in tourism and seafood value chains, including aquaculture; national and local institutions engaged in the management of marine resources, including fishers' associations and government entities.

Since 2018, SeyCCAT receives US\$ 500, 000 annually from the blue bond and US\$200,000 from Debt swap and this has funded several projects.

#### BIODIVERSITY FINANCING

Seychelles was selected as one of 30 countries to pilot the Global Biodiversity Finance (BIOFIN) Initiative which is co-funded by the European Union, Germany, Norway, Flanders and Switzerland, with the United Nation Development Programme (UNDP) as the Executive Agency.

BIOFIN is a global collaborative partnership which aims to develop an evidence-based methodology which improves biodiversity outcomes using finance and economics. It pilots new and innovative approaches and methodologies for resource mobilisation for biodiversity and supports the implementation of National Biodiversity Strategic Action Plans (NBSAP). The BIOFIN methodology has been appraised by parties to the Convention of Biological Diversity as a good instrument supporting the effort to improve resource mobilisation for biodiversity conservation (CBD Aichi Target 20).

In line with the BIOFIN Workbook, the approach in Seychelles consisted of an initial Policy and Institutional Review, involving the identification of biodiversity drivers of change in the country. This exercise was followed by a Biodiversity Public (and Private) Expenditure Review, pinpointing policies responsible for biodiversity loss and related areas for alignment and efficiency. These steps allowed the BIOFIN project team to develop a Biodiversity Finance Needs Assessment, by costing the NBSAP (SCR320 million).

The next step of BIOFIN was to develop the Biodiversity Finance Plan that presents a coherent and comprehensive national approach to biodiversity finance, including a mix of finance solutions, by engaging the public sector, private sector, and civil society.

The Biodiversity Finance Plan (BFP) incorporates the findings of the BIOFIN Policy and Institutional Review; the BIOFIN Expenditure Review; and the BIOFIN Financial Needs Assessment.

The Seychelles Biodiversity Finance Plan maps out a holistic approach and systemic change for financing biodiversity conservation going forward. In this connection, the Biodiversity Finance Plan incorporates a review of all related initiatives in Seychelles which impact on biodiversity viz. the Marine Spatial Planning (MSP) Initiative; the SeyCCAT; the South West Indian Ocean Fish (SWIOFish) Project; the Blue Bonds Initiative; and the Protected Areas Finance Project. The aim is to synergise all related initiatives, including the newly launched Global Climate Change Alliance (GCCA+) Project, such that there is a coherent vision as well as optimal use of resources allocated to the individual projects and initiatives.

One of the main solutions that Seychelles came up with As part of the Biodiversity Finance Plan was the institutionlisation of the BIOFIN process through the creation of a Biodiversity Finance Unit. This amin objectives of this new unit is :

- ❖ Facilitate, coordinate and synergize ongoing national biodiversity initiatives/projects including those within the NBSAP.
- ❖ Monitor and Evaluate NBSAP implementation.
- ❖ Mainstream biodiversity into the economic planning and budgetary processes.
- ❖ Increase national capacity to develop biodiversity centric project proposals
- ❖ Facilitate resource mobilization for biodiversity projects particularly NBSAP projects.
- ❖ Assist with reporting to CBD

### Resource Mobilisation and Gender

The newly created Biodiversity Finance Unit (BFU) currently sits within the Biodiversity Conservation and Management Division, MEECC headed by a woman. The Senior Biofin project coordinator is female and she will be responsible for the implementation of the Finance Plan for Biodiversity Conservation. The Seychelles Biofin Plan reviews all related initiatives in Seychelles such as MSP and SeyCCAT both led by women. The plan provides different biodiversity finance solutions in several sectors including Biosecurity services, sustainable fisheries and blue economy, Tourism etc.

Women are leading many of the successful projects that looks at issues such as corals, education about the marine environment, sustainable tourism and wetland rehabilitation. The CEO of SeyCCAT and its entire secretariat are female.

The Central Bank of Seychelles advises the Government on banking, monetary and financial matters, including the monetary implications of proposed fiscal, credit policies or operations of the Government and promotes a sound financial system. Its board members include 5 men and 3 women. The Governor of the Central Bank is a woman.

### **Indicators used in this assessment**

*Indicator(s) used in this assessment*

1. SEYCCAT Established
2. Creation of a Biodiversity finance Unit
3. Amount of resources mobilised each year
4. Success rates of supported initiatives

### **Please describe any other tools or means used for assessing progress**

N/A

**Relevant websites, web links and files** (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

**SEYCCAT:** <https://seyccat.org/>

**BIOFIN Seychelles:** <https://www.biodiversityfinance.net/seychelles>

**GEF-UNDP-Government of Secyhelles Protected Area Financing Project:**  
<https://pcusey.sc/projects/>

**Level of confidence of the above assessment**

- ☐ Based on comprehensive evidence
- ☒ Based on partial evidence
- ☐ Based on limited evidence

**Adequacy of monitoring information to support assessment**

- ☐ Monitoring related to this target is adequate
- ☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)
- ☐ No monitoring system in place
- ☐ Monitoring is not needed

## SECTION IV

### Section IV. Description of the national contribution to the achievement of each global Aichi Biodiversity Target

Seychelles adopted the Aichi Biodiversity Targets as its National Targets. Its activities therefore are covered extensively in Sections II and III of this report. Furthermore as a geographically isolated Small Island Developing State with a population of well below 100,000 people the significance of Seychelles' activities are going to be very much focused on the national scenario with limited contribution to the Global target simply because of the scale of activities involved. However, despite those considerations Seychelles has excelled in the implementation of certain ABTs or aspects of them in such a way that it has made a significant contribution to the global approach – specifically ABTs: 6 Marine life, 9 IAS, 11 Protected Areas, 12 Threatened Species and 20 Finances.

**Aichi Biodiversity Target 1. By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 1** and **Section II 1.2**. It is not considered that Seychelles implementation of ABT 1 has had a disproportionate impact upon the global implementation of this target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

Seychelles has had an integrated approach to Environment Education since the mid-1990s. Environment issues cross-cut school curricula and are regularly represented throughout all national media and the printed press. This approach clearly supports SDG 4: *“Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”* And helps promote SDG 12: *“Ensure sustainable consumption and production patterns”*.

**Aichi Biodiversity Target 2. By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 2**. It is not considered that Seychelles implementation of ABT 2 has had a disproportionate impact upon the global implementation of this target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

Biodiversity values have been explicitly incorporated into the planning process since 1994. National accounting mechanisms however do not incorporate biodiversity values and environmental economics is a key skills deficit in the country.

The planning process governed by the Town and Country Planning Act through its mandated Planning Authority, with input from the Environment Protection Act (1994 & 2016) and its 1996 EIA regulations. This mechanism provides significant support for the national implementation of the following SDGs: 9. *"Build resilient infrastructure, promote inclusive and sustainable industrialization and foster Innovation"*; 11. *"Make cities and human settlements inclusive, safe, resilient and sustainable"* and 14. *"Conserve and sustainably use the oceans, seas and marine resources for sustainable Development"*.

**Aichi Biodiversity Target 3. By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 3**. It is not considered that Seychelles implementation of ABT 3 has had a disproportionate impact upon the global implementation of this target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

Little action has been taken in this domain and this has been noted in other sections of this report. A key area where perverse incentives have been identified and recommended for removal is the fisheries sector (i.e. SDG 14) (**Vivid Economics 2015**) but this has yet to be acted upon.



**Aichi Biodiversity Target 4. By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 4**. It is not considered that Seychelles implementation of ABT 4 has had a disproportionate impact upon the global implementation of this target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

Significant progress has been made with regard to the gathering and treatment of solid waste and waste water. There have also been advances in the reduction of waste production through re-cycling initiatives and the banning of various single use items. These measures support particular SDG 11 and SDG 12.

**Aichi Biodiversity Target 5. By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 5 and Section II 1.8** of this report.

Seychelles has made particular progress in the rehabilitation and/or restoration of small island ecosystems (see **Section II 1.8**) which coupled with IAS eradications have constituted the single most significant conservation breakthrough in Seychelles in the last 50 years resulting in outstanding achievements in the domain of Threatened species conservation (see **Section II 1.7**).

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The successes in island ecosystem rehabilitation and restoration have significantly advanced the national pursuit of SDG 15: *"Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss"*.

**Aichi Biodiversity Target 6. By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 6 and Section II 1.3** of this report.

Seychelles has made significant contribution to the global advancement of this ABT through its international championing of the Blue Economy Concept and its national formulation and implementation of its Blue Economy Roadmap (in partnership with the Commonwealth Secretariat) and its Marine Spatial Planning Initiative (in partnership with The Nature Conservancy).

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable**

**These national initiatives in particular support the furtherance of SDGs:** 2 *"End hunger, achieve food security and improved nutrition and promote sustainable agriculture"*, 8 *"Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all"*, 12 *"Ensure sustainable consumption and production patterns"* and 14 *"Conserve and sustainably use the oceans, seas and marine resources for sustainable development"*.

**Aichi Biodiversity Target 7. By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 7.1, 7.2 & 7.3** of this report. It is not considered that Seychelles implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of this target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.**

The initiatives described in **Section III 7.1 - 7.3** contribute to the national pursuit of SDGs: 2 *"End hunger, achieve food security and improved nutrition and promote sustainable agriculture"*, 12 *"Ensure sustainable consumption and production patterns"* and 15 *"Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss"*.

**Aichi Biodiversity Target 8. By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 8** of this report. It is not considered that Seychelles' implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of the target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The initiatives described in **Section III ABT 8** of this report contribute to the national pursuit of SDGs: 3 *"Ensure healthy lives and promote well-being for all at all ages"*, 6 *"Ensure the availability and sustainable management of water and sanitation for all"*, 11 *"Make cities and human settlements inclusive, safe, resilient and sustainable"* and 12 *"Ensure sustainable consumption and production patterns"*.

**Aichi Biodiversity Target 9. By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.6 and Section III ABT 9** of this report.

Seychelles has made a significant contribution to the realisation of this Aichi Biodiversity Target. Most notably through pioneering the eradication of rats and cats in forested, mountainous tropical island ecosystems and maintaining them alien mammal free. This coupled with ecosystem rehabilitation has enabled outstanding achievements in rare species conservation and constitutes the single biggest achievement in in conservation in Seychelles.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

These activities have greatly advanced Seychelles' implementation of SDG 15: *"Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss"*.

**Aichi Biodiversity Target 10. By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.3** and **Section III ABT 10** of this report additional information on the status of coral reefs is provided in **Section VII 2**. It is not considered that Seychelles' implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of the target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

Seychelles has invested a lot of resources in coral gardening with a view to identifying and, reproducing *en masse* and re-planting temperature tolerant species/varieties of coral. This has supported Seychelles' implementation of SDGs: 13 "*Take urgent action to combat climate change and its impacts*" and 14 "*Conserve and sustainably use the oceans, seas and marine resources for sustainable development*".

At the time of reporting Seychelles is also working on a regional large scale restoration project for climate change adaptation and rehabilitation of ecosystem services.

**Aichi Biodiversity Target 11. By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.5 & 1.4**, and **Section III ABT 11** of this report.

Seychelles has long utilised Protected areas as its primary tool in the conservation of biodiversity. The area of land protected at 47% greatly exceeds the international target and during this reporting period its marine area protected has increased dramatically to 15% with another 15% programmed to be designated by 2020. The Marine Spatial Planning Initiative and its supporting innovative financing mechanisms are significant contributions to the global implementation of this Target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The Protected Area Network of Seychelles yields cross-cutting benefits to the pursuit of Sustainable Development but with regard to the specific SDGs it in particular supports: 6. *“Ensure the availability and sustainable management of water and sanitation for all”*, 14. *“Conserve and sustainably use the oceans, seas and marine resources for sustainable development”* and 15 *“Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss”*.

**Aichi Biodiversity Target 12. By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.7 and Section III ABT 12** of this report.

Seychelles has made outstanding progress in the conservation of its threatened species of endemic birds as a result of its great advances in IAS eradication and ecosystem rehabilitation on small islands.

**Based on the description of your country’s contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

Seychelles excellent work in this domain directly furthers the implementation of SDG 15 *“Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss”*.

**Aichi Biodiversity Target 13. By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 12** of this report. It is not considered that Seychelles’ implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of the target.

**Based on the description of your country’s contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

**Activities under this target also support SDG 2 “End hunger, achieve food security and improved nutrition and promote sustainable agriculture”.**

**Aichi Biodiversity Target 14. By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.8 and Section III ABT 14** of this report. It is not considered that Seychelles’ implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of the target.

Seychelles has however realised the protection of water and soil cycles on its principal populated islands.

**Based on the description of your country’s contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

These activities have supported the national implementation of SDGs: “6-Ensure the availability and sustainable management of water and sanitation for all”, 11 “ Make cities and human settlements inclusive, safe, resilient and sustainable”, 13 “Take urgent action to combat climate change and its impacts” and 15 “Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss”.

**Aichi Biodiversity Target 15. By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks have been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.8 and Section III ABT 15** of this report.

The areas in question in the Seychelles context will make negligible difference to the global pursuit of this target.

**Based on the description of your country’s contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The actions taken contribute to the implementation of SDGs: 6 *“Ensure the availability and sustainable management of water and sanitation for all”*, 13 *“Take urgent action to combat climate change and its impacts”* and 15 *“Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss”*.

**Aichi Biodiversity Target 16. By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.1** and **Section III ABT 16** of this report. It is not considered that Seychelles' implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of the target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The actions taken contribute to the implementation of SDGs: *“3- Ensure healthy lives and promote well-being for all at all ages”*; *“8- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”*; and SDG 15- *“Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage Forests, combat desertification and halt and reverse land degradation and halt biodiversity loss”*.

**Aichi Biodiversity Target 17. By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.1** and **Section III ABT 17, Including the Gender report in Appendix 1** of this report. It is not considered that Seychelles' implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of the target.

The implementation of key priority areas in the NBSAP has certainly helped Seychelles in achieving the aichi biodiversity targets as well as meet global commitments.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The actions taken contribute to the implementation of SDGs: *"5- Achieve gender equality and empower all women and girls" (See also appendix 1); "13-Take urgent action to combat climate change and its impacts"; "14- Conserve and sustainably use the oceans, seas and marine resources for sustainable Development"; "16-Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels"; and "17- Strengthen the means of implementation and revitalize the global partnership for sustainable development".*

**Aichi Biodiversity Target 18. By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.1** and **Section III ABT 18** of this report. It is not considered that Seychelles' implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of the target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The actions taken contribute to the implementation of SDGs: *"2-End hunger, achieve food security and improved nutrition and promote sustainable agriculture"; "3-Ensure healthy lives and promote well-being for all at all ages" and "5-Achieve gender equality and empower all women and girls" (See also Appendix 1).*



**Aichi Biodiversity Target 19. By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section III ABT 19** of this report. It is not considered that Seychelles' implementation of this ABT during the reporting period has had a disproportionate impact upon the global implementation of the target.

Seychelles has established the National Institute for Science, technology and Innovation (NISTI) that is seeking to address this target.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The work undertaken in this regard supports SDGs: 4 *"Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"* and 17 *"Strengthen the means of implementation and revitalize the global partnership for sustainable development"*.

**Aichi Biodiversity Target 20. By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.**

**Please describe how and to what extent your country has contributed to the achievement of this Aichi Biodiversity Target and summarize the evidence used to support this description:**

Seychelles National targets are identical to the Aichi Biodiversity Targets the activities undertaken are therefore covered in depth in **Section II 1.9** and **Section III ABT 20** of this report.

Seychelles has pioneered new approaches to financing through its debt for nature swap, Blue Grants and the public private Conservation and Climate Adaptation Trust. In 2018, Seychelles issued the first ever-Blue Bond, which has been recognised globally as a best practice. Many countries are now exploring these same approaches to sustainable financing mechanisms.

**Based on the description of your country's contributions to the achievement of the Aichi Biodiversity Targets, please describe how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals:**

The actions taken contribute to the implementation of SDGs: "10- Reduce inequality within and among countries" and "17- Strengthen the means of implementation and revitalize the global partnership for sustainable development".

## SECTION V

**Section V. Description of the national contribution to the achievement of the targets of the Global Strategy for Plant Conservation (completion of this section is optional)**

Using the template below, please describe your country's contribution towards the achievement of the targets of the Global Strategy for Plant Conservation. This template should be replicated for each of the 16 targets of the Global Strategy for Plant Conservation.

<b>V. Description of the national contribution to the achievement of the targets of the Global Strategy for Plant Conservation</b>
<p><b>Does your country have national targets related to the GSPC Targets?</b></p> <p><input checked="" type="checkbox"/> Yes. Please provide details on the specific targets below:</p> <p>Yes the GSPC targets have been adopted nationally.</p> <p>or:</p> <p><input type="checkbox"/> No, there are no related national targets</p>
<p><b>Please provide information on any active networks for plant conservation present in your country.</b></p> <p>The Plant Conservation Action Group is a local NGO formed in 2002 that has pioneered a coordinated approach to plant conservation in Seychelles, galvanising partnerships with other agencies <i>inter alia</i> the Seychelles Natural History Museum, the Department of Environment, Seychelles National Parks Authority, Seychelles National Botanical Gardens Foundation. Details of its activities and achievements are provided under the target assessments below.</p> <p>(The responses below are based upon information kindly provided by Mr James Mougall of the PCA).</p>
<p><b>Please describe the major measures taken by your country for the implementation of the Global Strategy for Plant Conservation.</b></p> <p>See information provided below for each Target.</p>
<p><b>Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:</b></p> <p><b>GSPC Target 1</b></p> <p><input checked="" type="checkbox"/> On track to achieve target at national level</p> <p><input type="checkbox"/> Progress towards target at national level but at an insufficient rate</p> <p><input type="checkbox"/> No significant change at national level</p> <p>Please explain the selection above:</p> <p>See below.</p>
<p><b>Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:</b></p>

The Herbarium Project (see PCA newsletter Kapisen 13 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_13.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_13.pdf)) gave rise to the first edition of Seychelles Plant Gallery <http://www.seychellesplantgallery.com/>, an updated account of the Seychelles flora and a list of the herbarium specimens (see PCA newsletters Kapisen 14, pg. 14; Kapisen 17, pgs. 10-11 <http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen>)

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 2**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below.

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

The Key Biodiversity Areas (KBA) Project is paving the way for a new project which will eventually allow us to assess all of the plant species of special concern (rare, threatened, endemic, native) in the Seychelles' inner granitic islands (see PCA newsletter Kapisen 21 and the list of species of special concern in the Seychelles:

[https://www.researchgate.net/publication/259032165\\_Seychelles\\_Key\\_Biodiversity\\_Areas\\_-\\_Output\\_1\\_List\\_of\\_species\\_of\\_special\\_concern](https://www.researchgate.net/publication/259032165_Seychelles_Key_Biodiversity_Areas_-_Output_1_List_of_species_of_special_concern)

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 3**

- ☒ On track to achieve target at national level  
☐ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below.

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

In 2007, the Seychelles Plant Conservation Research Agenda 2008-2015 <http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/seychellesagendafinal.pdf> was produced to guide national plant conservation actions (see PCA newsletter Kapisen 8 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_8.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_8.pdf))

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 4**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below.

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

Since 2011, approximately 10 ha of a distinct and endangered vegetation type on the inselbergs (glacis) of Mahé Island have been actively managed as part of a long-term programme to measure management effectiveness through the Glacis Restoration Project- how this unique plant community responds to human intervention (see PCA newsletters Kapisen 16, pgs. 6-7; Kapisen 20, pgs. 16-19 <http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen> and our latest publication: Kaiser-Bunbury, C.N., Mougil, J., Whittington, A.E., Valentin, T., Gabriel, R., Olesen, J.M. and Blüthgen, N., 2017. Ecosystem restoration strengthens pollination network resilience and function. *Nature*, 542(7640), p.223 <https://pubmed.ncbi.nlm.nih.gov/28135718/>

In the outer islands this area has been significantly exceeded by the work being undertaken on Aldabra Atoll (see **Section II 1.8**).

Extensive work has also been undertaken by the NGO TRASS on the Island of Praslin (see **Section II 1.8 Table 7a**)

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 5**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

The atlas of important plant areas in the Seychelles' inner granitic islands was published in 2013 as part of the KBA Project.

[https://www.researchgate.net/publication/259032364\\_Seychelles\\_Key\\_Biodiversity\\_Areas\\_-\\_Output\\_6\\_Patterns\\_of\\_conservation\\_value\\_in\\_the\\_inner\\_islands](https://www.researchgate.net/publication/259032364_Seychelles_Key_Biodiversity_Areas_-_Output_6_Patterns_of_conservation_value_in_the_inner_islands)

The management plan for Silhouette Island National Park was published in February 2018

[https://www.researchgate.net/publication/323454259\\_Silhouette\\_Adaptive\\_Conservation\\_Management\\_Plan\\_2018-2022\\_using\\_Bioma\\_a\\_simple\\_MS\\_Access\\_database](https://www.researchgate.net/publication/323454259_Silhouette_Adaptive_Conservation_Management_Plan_2018-2022_using_Bioma_a_simple_MS_Access_database)

Management plans for Aldabra Special Reserve and Vallee de Mai Nature Reserve are under implementation and considered very effective.

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 6**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

See Section III ABT 7 for status.

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 7**

- ☒ On track to achieve target at national level  
☐ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

All known threatened plant species are currently conserved in one or more of the following protected areas: Morne Seychellois National Park, Praslin National Park and Curieuse National Park, Silhouette Island National Park, Aride Island Special Reserve, Vallée de Mai Nature Reserve and Aldabra Atoll Special Reserve. This is a link to the list of species of special concern in the Seychelles.

[https://www.researchgate.net/publication/259032165\\_Seychelles\\_Key\\_Biodiversity\\_Areas\\_-\\_Output\\_1\\_List\\_of\\_species\\_of\\_special\\_concern](https://www.researchgate.net/publication/259032165_Seychelles_Key_Biodiversity_Areas_-_Output_1_List_of_species_of_special_concern)

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 8**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

Since 1998, Seychelles has embarked on an ambitious ex-situ conservation programme to conserve all its known native plant species in a newly created botanical garden 'the National Biodiversity Centre', and by 2004, about 50% of the known endemic plant species were present in the garden (see PCA newsletter Kapisen 2, pg. 13

[http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_2.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_2.pdf))

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 9**

- ☒ On track to achieve target at national level  
☐ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

In 2013, a group of farmers in the Val 'Andor area, South of Mahé Island, embarked on a project to collect and save old, neglected and rare local food crops with the support of SAA (see PCA newsletter Kapisen 15, pg. 15

[http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_15.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_15.pdf))

See **Section III ABT 13**

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 10**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

See **Section II 1.6** and **Section III ABT 9**.

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 11**

- ☒ On track to achieve target at national level  
☐ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

The Coco de Mer (*Lodoicea maldivica*) was listed under appendix III on the CITES list upon the request of the Seychelles Government in 2010.

<https://www.cites.org/eng/news/pr/2010/20101014-applIII.shtml>, and the Coco de Mer (Management) Degree of 1978 was amended in 2015 to impose new and more severe punishments for illegal trade. In 2017 a National Coco de Mer Policy was also approved by Government.

Get an insight on the issue from a local expert (see PCA newsletter Kapisen 4, pgs. 14-15 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_4.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_4.pdf))

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 12**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

There is a permit system in place for timber harvesting under the Biodiversity Conservation and Management Division.

It is known that some rarer medicinal plant species are not being collected sustainably and this remains a challenge to be effectively addressed.

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 13**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate

☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

Traditional use of plant resources is covered in the following (see Kapisen 4, pgs. 13-14; Kapisen 7, pg. 4 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_7.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_7.pdf),

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 14**

- ☒ On track to achieve target at national level  
☐ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

Since the formation of PCA in 2002, through its newsletter 'Kapisen', the NGO has been actively raising awareness of the important of plants in our lives, particularly in these special issues: Kapisen 7 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_7.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_7.pdf),

Kapisen 13 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_13.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_13.pdf),

Kapisen 15 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_15.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_15.pdf) and

Kapisen 18 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_18.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_18.pdf), but PCA members have gone further with their messages, touching other organisations by providing local plant identification training course (see PCA newsletter Kapisen 19, pgs. 3-5

[http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_19.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_19.pdf)) and even reaching the University of Seychelles through its curriculum

[https://www.researchgate.net/publication/301789261\\_Practical\\_plant\\_identification\\_training\\_guide](https://www.researchgate.net/publication/301789261_Practical_plant_identification_training_guide) and the BSc student's practical field experience (see PCA newsletter Kapisen 17, pg. 24

[http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_17.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_17.pdf)

See also **Section II 1.2** and **Section III ABT 1.**

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 15**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level



Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

The Herbarium Project (see PCA newsletter Kapisen 13 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_13.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_13.pdf)) has revived the Seychelles National Herbarium and University graduate has joined the team. The Herbarium has progressively acquired much of the needed equipment for the herbarium (see PCA newsletter Kapisen 20, pg. 26 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_20.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_20.pdf)) and upcoming Kapisen 21.

Resources and trained personnel are still chronically lacking however with respect to achieving the Targets under Objective II. Trained people are scarce and often shared among the different organisations working towards targets 4, 5, 7 and 10, and long-term investment in threatened plant species recovery and habitat restoration programmes is not adequate.

**Category of progress towards the target of the Global Strategy for Plant Conservation at the national level:**

**GSPC Target 16**

- ☐ On track to achieve target at national level  
☒ Progress towards target at national level but at an insufficient rate  
☐ No significant change at national level

Please explain the selection above:

See below

**Please describe how and to what extent your country has contributed to the achievement of this GSPC Target and summarize the evidence used to support this description:**

Since its formation in 2002, PCA has actively engaged with other organisations and provides a platform through its annual newsletter 'Kapisen' <http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen> for its members, collaborators and partners to share their research results, experiences and lessons learnt on a wide range of plant related topics: The evolutionary history of Seychelles plants (Kapisen 17), Our life depends on plants (Kapisen 15) to New ideas about conservation and restoration (Kapisen 16), and even attracting marine biologists to talk about plant life in the sea (see Kapisen 16, pgs. 8-11 [http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen\\_16.pdf](http://www.pcaseychelles.org/uploads/1/2/3/6/12369400/kapisen_16.pdf))

## SECTION VI

Optional section which has not been included in the Seychelles report.

## SECTION VII

### Section VII. Updated biodiversity country profiles

VII. Updated biodiversity country profile
<p><b><u>Biodiversity facts</u></b></p> <p><b>Status and trends of biodiversity, including benefits from biodiversity and ecosystem services and functions:</b></p> <p>Seychelles has a landmass of some 455 km<sup>2</sup> divided between 155 islands spread over a vast marine Exclusive Economic Zone (EEZ) of approximately 1.4 million km<sup>2</sup>. Seychelles' resource area is therefore 0.03% terrestrial and 97.97% marine and in terms of habitat this ratio is much greater when the water column is factored in. In terms of endemic biodiversity, however, this relationship is inverted with the vast majority of known endemic species being terrestrial.</p> <p>The granite islands have been isolated from continental landmasses for some 65 million years. Endemism is high at 50-85% for different animal groups, in general, and at approximately 45% for plants. There is a correlation between the number of endemic plant species and the ages of the islands where they occur. The ancient granitic islands are estimated to have 80 species of endemic flowering plants out of some 900 in total, whereas the coral islands harbour some 30-40 endemics out of 260 species. The Coco-de-mer palm (<i>Lodoicea maldivica</i>) classified as Endangered by the IUCN, is a national flagship species for tourism and conservation. Seychelles has land birds with linkages to Africa, Asia and Madagascar, which have evolved into unique species and subspecies. There are 13 species and 17 subspecies of endemic birds. Surviving bird populations include 8 Globally Threatened Species, with some of the most endangered land birds in the world, including the Black paradise flycatcher (<i>Terpsiphone corvina</i>) and the Magpie robin (<i>Copsychus sechellarum</i>). The only indigenous land mammals are bats (5 species with 2 endemic), although various other land mammals have been introduced.</p> <p>An estimated 1,200 marine fish species occur with only 1-2% endemics, including the Seychelles clown fish (<i>Amphiprion fuscocaudatus</i>), Daly's dwarf goby (<i>Eviota dalyi</i>). Gardiner's perchlet (<i>Plectranthias gardineri</i>) and the Seychelles gulper shark (<i>Centrophorus sechellorum</i>). 28 species of marine mammal are also currently known to utilise Seychelles' waters.</p> <p>The Seychelles' forest coverage is estimated to be approximately 71%. The total natural mangrove area continued to decline through much of the 20th Century but has been considered relatively stable since the 1980s at approximately 25 km<sup>2</sup>. Eight species of mangrove occur naturally in Seychelles. It is estimated that Seychelles has some 1,700 km<sup>2</sup> of coral reef<sup>24</sup>, the majority of which occurs around the south eastern islands.</p> <p>Conservation areas cover 47% of the total surface area, comprising 19,760 ha of protected terrestrial areas with another 4% currently identified for designation. Prior to this reporting period less than</p>

<sup>24</sup> This is likely a significant underestimate with substantial areas of plateau not yet properly charted.

0.01% of Seychelles EEZ was protected. However the Marine Spatial Planning Initiative has seen that total reach 15% to date and it targeted to attain 30% in 2020. Aldabra, the largest raised atoll in the world and biodiversity treasure trove, was saved from major development in the late 1960s and designated a UNESCO World Heritage Site in 1982. Various other islands hold biodiversity assemblages of great regional and global significance, including 10 Important Bird Areas (IBAs). The water courses (146 rivers and rivulets) on the three main islands are listed for protection in recognition of their importance to human populations and socioeconomic development.

Seychelles has a very brief human history with no indigenous people and permanent human habitation only being established in the 1770s. Even in this short time however, due to the limited land area, terrestrial habitats have been extensively modified. In the granitic islands nearly all forest cover has been clear felled in the past and thus despite some 71% forest cover today the vast majority of it is secondary and dominated by introduced species. The small areas of forest that may still be primary are also subject to significant alien species invasion. The coralline islands have also been extensively changed, most having been cleared of natural vegetation from the late 19th century onwards for conversion to coconut plantation. Even the remote Aldabra Atoll was extensively modified *inter alia* by harvesting activities and the introduction of invasive species.

There has been widespread extirpation of many key animal species such as the Giant tortoise which was the primary herbivore, sea bird colonies, endemic land bird populations and extinction of the key coastal predator, the salt water crocodile.

In the marine ecosystems degradation was far more restricted until the latter half of the 20th century, but even so three key predators, the saltwater crocodile and two species of seal were extirpated early on in the human history of the islands. After the second world war advances in available technologies and skilled human resources have seen a progressive geographical expansion of fishing resulting in a significant fishing down of the marine food chain with the biomass of sharks and marine turtles dramatically reduced and more recently secondary predators such as the large serranids and key commodity species such as the Emperor red snapper showing widespread declines in occurrence and/or abundance.

In the context of the Convention on Biological Diversity Seychelles' biodiversity can be covered by three of the thematic work programmes namely: Forest, Inland Waters and Marine and Coastal biodiversity.

### **1. Terrestrial Biodiversity (Forest and Inland Waters biodiversity).**

The central archipelago is made up of granitic islands, except for the two northernmost islands of Bird and Denis which are coralline. The Seychelles bank is in fact a sunken micro-continent with the granite islands constituting the mountain peaks of this geological plate. The granite that underlies the bank and emerges in outcrops as the islands is some 750 million years old and is a fragment of the former super continent of Gondwana<sup>25</sup>. The remainder of the Seychelles archipelago i.e. the numerous islands to the south and southwest of the Mahé Plateau are composed of coral rock or are calcareous sand cays built on reefs. An older class of raised reef-rock atolls can be distinguished in the south-west - Aladabra, Astove and Cosmoledo - and Assomption and St Pierre islands are composed of partly recrystallized elevated reefs (**Baker 1963**).

The first European explorers found the granitic islands densely forested except for the hill sides of Curieuse Island and some of the smaller islets such as Recif. The mountainsides of Mahé and

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<sup>25</sup> Gondwana was comprised of what are today South America, Africa, Madagascar, India, Australia and Antarctica.

Silhouette from 200 metres upwards harbour the bulk of Seychelles known endemic biodiversity whilst Praslin Island supports unique stands of Coco-de-mer dominated forest and associated species. The great antiquity of the granite islands coupled with their isolation and topography has served to create and maintain high endemic biodiversity. The relative “youth” of the coralline islands coupled with their lack of topographic relief means that endemism is much less prevalent. The greater age and larger size of some of the raised atolls and islands, in particular Aldabra, has however resulted in higher rates of endemism.

**Table 9: Terrestrial and Inland Water Biodiversity Overview** (adapted from Nevill *et al* 2015).

Taxa	No. of Species	Notes
<b>Fungi</b>	Unknown	Fungal diversity is poorly known but overall species richness is considered low. 17 taxa, mostly macromycetes, have been recorded all of regional or pan tropical nature. 37 species of ectomycorrhizal fungi identified to date. 16 species of lichens and lichenicolous fungi recorded.
<b>Bryophytes</b>	<b>218</b>	110 species of moss and 108 of liverworts recorded. Bryophyte flora is still insufficiently known with each survey making new discoveries.
<b>Pteridophytes</b> (Ferns & allies)	72	90 species of ferns recorded – 12 endemic, 60 indigenous and 20 probably introduced.
Vascular plants	707	136 endemic and 571 indigenous species (913 introduced).
<b>Diptera</b>	589	295 endemic, 294 indigenous (plus 41 introduced).
<b>Arachnida</b>	347	204 endemic, 128 indigenous, 15 uncertain, 15 introduced.
<b>Myriapoda</b>	76	34 endemic, 34 indigenous, 8 uncertain origin (plus 3 introduced) main diversity and endemism in granitic islands.
<b>Coleoptera</b>	825	506 endemic, 319 indigenous, (plus 35 introduced species). Highest diversity found on large granitic islands. Aldabra has 122 species, 40 endemic.
<b>Orthopteroidea</b>	162	56 endemic, 106 indigenous (plus 5 introduced) species. Greatest diversity on the large granite islands, Aldabra has 34 species, 11 of which are endemic.
<b>Lepidoptera</b>	546	275 endemic, main diversity on larger granite islands, (Aldabra 57 sp. 20 endemic, Alphonse 46 sp. 35 endemic). The 271 non-endemic taxa include 11 probable introductions.
<b>Mollusca</b>	76	69 land species: 50 endemic, 19 indigenous (8 introduced). 7 freshwater species: 1 endemic, 6 indigenous (5 introduced)
<b>Vertebrata</b>		
Fish	15	2 endemic and 13 indigenous species. Several introduced.
Amphibia	11	11 endemic (4 frogs, 7 caecilians), (1 Introduced) species. Possible further speciation in endemics under investigation.
<b>Reptilia</b>		
Snakes	2	Both endemic (plus 1 introduced species).
Lizards	19	12 endemic (3 introduced). Various endemic subspecies.
Tortoise	1	Endemic giant tortoise ( <i>Aldabrachelys gigantea</i> ).

Birds	65	65 resident species – 18 breeding seabird species, 47 land and water birds of which 13 <sup>26</sup> are endemic. (13 introduced species).
Mammals	6	All indigenous mammals are bats, 4 endemic. (11 introduced)

### 1.1 Forest Biodiversity

The main granitic islands of the Seychelles were originally covered in tropical forest. The main island of Mahé in particular had exceptional hardwood forests (e.g. *Mimusops sechellarum*, *Vateriopsis sechellarum*, *Intsia bijuga*) on the coastal plains and lower mountain slopes, exhibiting very tall (30m), straight trees of huge girth. The intermediate and higher slopes were likewise heavily forested with valuable timber (e.g. *Northea hornei*, *Dillenia ferruginea*, *M. sechellarum*, *V. sechellarum*) though of lesser proportions. Valuable timber forests were found on the main islands of Mahé, Silhouette, Praslin and La Digue and to lesser extent on islands such as Saint Anne, Cerf, Felicite and Curieuse. Also of note were the Palmaceae (six species in six monotypic genera) with a wide range of habitat preferences and often forming palm-dominated communities in dryer and more exposed regions – most notably on the islands of Praslin and Curieuse where the famous Coco-de-mer (*Lodoicea maldivica*) dominated such communities<sup>27</sup>. The smaller granitic islands had less substantial forest structure sometimes dominated by *Pisonia grandis* (e.g. Cousin and Cousine) or scrub species typical of small Indo-pacific tropical islands.

Successive phases of human economic and development activity rapidly denuded these forests starting from the coastal plains upwards such that by the beginning of the 20<sup>th</sup> century only a few percent of original forest cover, remained on the main island of Mahé restricted to the highest and most inaccessible slopes. The same was true on the satellite islands of Mahe and to a lesser extent on Praslin and La Digue. The island of Silhouette because of its very steep terrain and relative isolation was the least effected with significant areas of forest above 250 metres not clear felled. Changing market demands and greater environmental awareness saw a major shift in land use from the 1950s and 1960s onwards and forest cover has recovered extensively in the subsequent 50-60 years and exceeds 70% (distribution of forest on the four main granite islands is shown in **Maps 5-8 Section II 1.8**). This forest however is secondary and highly invaded by alien species with for example much of the canopy dominated by Albizzia (*Paraserianthes falcataria*), Cinnamon (*C. verum*) and *Alstonia macrophylla*. The most abundant birds (*Acridotheres tristis*, *Geopelia striata* and *Foudia madagascariensis*) are invasive and most of the top predators (i.e. *Rattus spp*, *Felis catus*, *Canis domesticus*, *Tenrec ecaudatus* and *Tyto alba*) are alien to the islands.

**Table 10: Description and Status of Forest Biodiversity** (adapted from Nevill *et al* 2015).

Main Habitats	Typical/Key Species	Status
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<sup>26</sup> This does not include the Aldabra rail (*Dryolimnas (cuvieri) aldabranus*) which has yet to receive mainstream recognition as distinct species, work is in progress to determine its status.

<sup>27</sup> Good accounts of Seychelles flora can be found in: Baker 1877, Friedmann 1986 & Robertson 1989.

<p><b>Coastal and Lowland Forests (up to 200m asl).</b></p>	<p><b>Granitic Islands:</b> Typically littoral bush species on beach crest with broadleaf canopy starting some metres inland. Quite large patches of former coconut plantation are still to be seen. Increasingly highly developed on main populated islands. Typical species include:</p> <p><b>Flora:</b> i). Littoral: <i>Calophyllum inophyllum</i>, <i>Cordia subcordata</i>, <i>Hernandia nymphaefolia</i>, <i>Hibiscus tiliaceus</i>, <i>Pisonia grandis</i><sup>28</sup> <i>Scaevola sericea</i>, <i>Suriana maritima</i>, <i>Thespesia populnea</i>, <i>Tournefortia argentea</i> etc... introduced <i>Cocos nucifera</i> and <i>Casuarina equisetifolia</i>.</p> <p>ii). Lowland: (Native) <i>Terminalia catappa</i>, <i>C. inophyllum</i>, <i>Heritiera littoralis</i>, <i>C. subcordata</i> etc... Introduced <i>Cinnamomum verum</i>, <i>Adenanthera pavonina</i>, <i>Tabebuia pallida</i>, <i>C. nucifera</i>, various fruiting and ornamental species.</p> <p><b>Fauna:</b> i). Endemic : <i>Pleuropoma theobaldiana</i>, <i>Grandisonia spp</i>, <i>Lycognathopsis seychellensis</i>, <i>Phelsuma spp</i>, <i>Tachycnemis sechellensis</i>, <i>Trachylepis sechellensis</i>, <i>Trachylepis wrightii</i>, <i>Acrocephalus sechellensis</i>, <i>Alectroenas pulcherrima</i>, <i>Copsychus sechellarum</i>, <i>Falco araea</i>, <i>Foudia sechellarum</i>, <i>Hypsipetes crassirostris</i>, <i>Nectarinia dussumieri</i>, <i>Terpsiphone corvina</i>, <i>Coleura seychellensis</i>, <i>Pteropus seychellensis</i> etc...</p> <p>ii). Native : <i>Anous stolidus</i>, <i>Anous tenuirostris</i>, <i>Gygis alba</i>, <i>Onychoprion fuscata</i>, <i>Phaethon lepturus</i>, <i>Puffinus lherminieri</i>, <i>Puffinus Pacificus</i>, <i>Sterna anaethetus</i> etc...</p> <p>iii). Introduced : <i>Achatina fulica</i>, <i>Achatina immaculate</i>, <i>Acridotheres tristis</i>, <i>Foudia madagascariensis</i>, <i>Geopelia striata</i>, <i>Streptopelia picturata</i>, <i>Tyto alba affinis</i>, <i>Canis familiaris</i>, <i>Felis catus</i>, <i>Mus musculus</i>, <i>Rattus spp</i>, <i>Tenrec ecaudatus</i> etc...</p> <p><b>Coralline Islands.</b> Typically a dry broadleaf forest grading to open mixed bush, markedly less species diverse than the Granitic island equivalent.</p> <p>Aldabra at 152.6km<sup>2</sup> constitutes a little over a 3<sup>rd</sup> of the country's entire terrestrial surface area. Aldabra has a mosaic of habitats including coastal scrub, mixed scrub, dense patches of <i>Pemphis acidula</i>, open savanna like areas of grassy turf, beach and dune systems and limestone rock.</p> <p><b>Flora:</b> i). Native: <i>Guettarda speciosa</i>, <i>Pemphis acidula</i>, <i>P. grandis</i>, <i>S. sericea</i>, , <i>Suriana maritima</i>,</p> <p>ii). Introduced: <i>C. nucifera</i>, <i>C. equisetifolia</i>,</p> <p><b>Fauna:</b> i). Endemic: <i>Aldabrachelys gigantea</i>, <i>Cyathopoma picardense</i>, <i>Quickia aldabrensis</i>, <i>Rhachistia aldabrae</i>, <i>Dicrurus aldabranus</i></p> <p>ii). Native: <i>Birgus latro</i>, <i>A. stolidus</i>, <i>A. tenuirostris</i>, <i>Gygis alba</i>, <i>O. fuscata</i>, <i>Phaethon lepturus</i>, <i>Phaethon rubricauda</i>, <i>P. lherminieri</i>, <i>P. Pacificus</i>, <i>Sterna dougalli</i>, <i>Sterna sumatrana</i>, <i>Sula spp.</i> etc...</p> <p>iii). Introduced: <i>Capra hircus</i>, <i>Rattus spp</i>, <i>F. catus</i>, <i>Sus scrofa</i> etc..</p>	<p>The vast majority of human habitation and development infrastructure is found on the coastal plateau. Historical exploitation and the impact of IAS has seen significant decline in occurrence and abundance of biodiversity (e.g. seabird colonies and endemic avifauna).</p> <p><i>Rattus spp</i> have had major impact on native biodiversity as have various other IAS e.g. <i>F. catus</i>, <i>A. tristis</i>, <i>T. ecaudatus</i>, <i>Capra hircus</i>, <i>Sus scrofa</i> etc...</p> <p>Coastal forests today are entirely secondary but there have been excellent small-scale restoration projects on smaller islands that serve to maintain endangered endemic species.</p>
	<p>Broadleaf forest canopy with palm stands in drier areas.</p>	<p>Despite being almost entirely secondary and</p>

<sup>28</sup> Typically occurring on smaller islands and associated with seabird colonies.

<b>Intermediate Forest</b> (200 – 500m asl)	<p><b>Flora:</b> i). Endemic: <i>Aphloia seychellensis</i>, <i>Camptosperma seychellarum</i>, <i>Colea seychellarum</i>, <i>Dillenia ferruginea</i>, <i>Northia hornei</i>, <i>Pandanus hornei</i> etc...</p> <p>ii). Introduced: <i>A. pavonina</i>, <i>A. macrophylla</i>, <i>C. icaco</i>, <i>C. verum</i>, <i>Paraserianthes falcataria</i>, <i>Sandoricum koetjape</i>, <i>Swietenia macrophylla</i>, <i>T. pallida</i>, etc...</p> <p>iii). For dry forest see Palm forest.</p> <p><b>Fauna:</b> i). Endemic: <i>Cyathopoma blandfordi</i>, <i>Pachnodus niger</i>, <i>P. theobaldiana</i>, <i>Grandisonia spp</i>, <i>Phelsuma spp</i>, <i>T. sechellensis</i>, <i>T. seychellensis</i>, <i>Sooglossus gardineri</i>, <i>S. pipilodryas</i>, <i>A. pulcherrima</i>, <i>F. araea</i>, <i>H. crassirostris</i>, <i>N. dussumieri</i>, <i>O. insularis</i>, <i>Zosterops modestus</i>, <i>P. seychellensis</i> etc...</p> <p>ii). Introduced: <i>A. fulica</i>, <i>A. immaculata</i>, <i>A. tristis</i>, <i>F. madagascariensis</i>, <i>G. striata</i>, <i>S. picturata</i>, <i>T. a. affinis</i>, <i>F. catus</i>, <i>C. familiaris</i>, <i>Rattus spp</i>, <i>T. ecaudatus</i>, etc...</p>	<p>exotic dominated this vegetation type supports the greatest diversity of Seychelles' endemic species.</p> <p>This vegetation band plays a vital role in maintenance of water and soil cycles. Forest cover has expanded significantly in the last 70 years.</p>
<b>Mountain Forest</b> (500 – 910m asl)	<p><b>Flora:</b> i). Endemic: <i>Dillenia ferruginea</i>, <i>Excoecaria benthamiana</i>, <i>Nepenthes pervillei</i>, <i>Northia hornei</i>, <i>Pandanus sechellarum</i>, <i>P. Multispicatus</i>, <i>Randia sericea</i>, <i>Roscheria melanochaetes</i>, <i>Timonius sechellensis</i>, etc...</p> <p>ii). Introduced: <i>A. macrophylla</i>, <i>C. verum</i>, <i>P. falcataria</i>, <i>P. indicus</i> etc</p> <p><b>Fauna:</b> i). Endemic: <i>Edentulina moreleti</i>, <i>Pachnodus spp</i>, <i>Pilula mahesiana</i>, <i>Punctum seychellarum</i>, <i>Grandisonia spp</i>, <i>Phelsuma spp</i>, <i>Sooglossus sechellensis</i>, <i>S. thomasseti</i>, <i>T. sechellensis</i>, <i>Aerodramus elaphrus</i>, <i>A. pulcherrima</i>, <i>F. araea</i>, <i>H. crassirostris</i>, <i>N. dussumieri</i>, <i>O. insularis</i>, <i>Z. modestus</i> etc...</p> <p>ii). Introduced: <i>A. tristis</i>, <i>T. alba</i>, <i>Rattus spp</i>, <i>T. ecaudatus</i> etc...</p>	<p>Predominantly secondary and highly invaded, forest cover in this range has increased significantly over the last 60 years and plays a vital role in maintenance of water and soil cycles. Important area for human aesthetic and leisure value.</p>
<b>Palm Forest</b>	<p>The islands of Praslin and Curieuse exhibit special palm forest climax vegetation communities including the presence of <i>Lodoicea maldivica</i> (endemic to the two islands). Palm forest communities also occur in dryer areas and on ridges of other forest categories.</p> <p><b>Flora:</b> i). Endemic: <i>Deckenia nobilis</i>, <i>L. maldivica</i>, <i>Nephrosperma vanhoutteana</i>, <i>Phoenicophorium borsigianum</i>, <i>Roscheria melanochaetes</i>, <i>Verschaffeltia splendida</i>, <i>Pandanus spp</i>, <i>D. ferruginea</i> etc...</p> <p>ii). Introduced: <i>C. verum</i>, <i>C. icaco</i>, <i>A. macrophylla</i>, various vine species etc...</p> <p><b>Fauna:</b> i). Endemic: <i>Filicaulis seychellensis</i>, <i>Pachnodus praslinus</i> (Praslin only), <i>P. niger subfuscus</i> (P only), <i>Stylodonta studeriana</i> (P only), <i>Ailuronyx trachygaster</i>, <i>A. Tachyscopaeus</i>, <i>Phelsuma spp</i>, <i>A. pulcherrima</i>, <i>Coracopsis barklyi</i> (Praslin and Curieuse only), <i>H. Crassirostris</i>, etc...</p> <p>ii). Introduced: <i>A. Tristis</i>, <i>F. cattus</i>, <i>Rattus spp</i>, etc...</p>	<p>The <i>L. maldivica</i> dominated palm forests of Praslin and Curieuse with 6 endemic species of palm are of particular interest. Natural regeneration of <i>L. maldivica</i> is limited due to excessive nut harvesting, but the management of Fond Ferdinand and the long standing work in the Vallee-de-Mai Nature Reserve has seen enhanced protection and re-planting.</p>
<b>Inselbergs</b>	<p><b>Flora:</b> i). Endemic: <i>Erythroxylum sechellarum</i>, <i>Excoecaria benthamiana</i>, <i>Lophoschoeneus hornei</i>, <i>Medusagyne oppositifolia</i>, <i>Memecylon eleagnai</i>, <i>Nepenthes pervillei</i>, <i>Pandanus multispicatus</i>, <i>Soulamea terminaloides</i> etc...</p> <p>ii). Introduced: <i>C. verum</i>, <i>Annas commosus</i></p>	<p>Important refuges for specific endemic flora. Human aesthetic and leisure value.</p>
<b>Riverine Forest</b>	<p><b>Flora:</b> i). Endemic: <i>Pandanus balfouri</i>, <i>Pandanus hornei</i>, <i>Pandanus sechellarum</i>, <i>Phoenicophorium borsigianum</i>, <i>Verschaffeltia splendida</i> ii). Indigenous: <i>Barringtonia racemosa</i>, <i>Heritiera littoralis</i>.</p>	<p>Vital for the preservation and maintenance of the water cycle. Higher reaches of the river</p>



	ii). Introduced: <i>Paraserianthes falcata</i> , <i>Artocarpus spp</i> , <i>Bambusa spp</i> etc... <b>Fauna:</b> i). Endemic: <i>Calumma tigris</i> , <i>O. Insularis</i> etc... ii). Introduced: <i>Rattus spp</i> etc...	gorges also still harbour relict flora assemblages.

Only small relict areas of primary forest remain. The primary hardwood forests are gone with valuable species such as *Mimusops*, and *Intsia* reduced to scarcity and *Vateriopsis* driven to the brink of extinction. The main herbivore giant tortoises were extirpated from the central archipelago in the early 19<sup>th</sup> century, some bird species lost and many others restricted to small vestige ranges and populations.

The coralline islands were also heavily impacted by historical exploitation from the felling of mangroves for timber, the unsustainable harvesting of seabirds and nesting turtles to complete transformation to coconut plantations. Guano was also mined on some islands, through to the mid-20<sup>th</sup> century, with considerable impact (e.g. Assumption Island). Latterly failed agricultural initiatives and the collapse of the coconut oil market in the 1980s resulted in livestock (e.g. pigs and goats) being left feral on highly disturbed islands along with diverse other introduced plant species. Seabird colonies have been lost or greatly reduced in abundance and diversity; giant tortoises have been extirpated from all their previous colonies, except for Aldabra, and nesting marine turtle populations greatly reduced. Finally all such low lying islands are now threatened by sea level rise.

**Table 11: Trends in Forest Biodiversity** (adapted from **Nevill et al 2015**).

Habitat	Trend	Drivers and specific trends
Coastal and Lowland	↔	<p>⚠: In general the trend is for further but controlled development 25 metres from the high water mark with ongoing overall decline in area.</p> <p>⚠: IAS (diverse plant species and mammals especially rats, cats and dogs) are established on the main granitic islands.</p> <p>⬆: There are, however, some very notable successful and ongoing rehabilitation projects in this habitat.</p> <p>⬆: Increasing bird populations indicate improvement of habitat quality throughout Aldabra (33% of total national surface area) following eradication of feral goats. .</p> <p>↔: Overall quantitative decline in this habitat in the central archipelago but notable qualitative improvement due to various small island ecosystem rehabilitation projects, plus extensive recovery recorded in Aldabra.</p>
Intermediate	↔	<p>⚠: The primary issue is the dominant presence of IAS – rate of ongoing encroachment and degree of impact upon indigenous biodiversity however, is not known.</p> <p>⚠: Increased habitation, infrastructure and small scale agriculture (farming, tea, timber plantations).</p> <p>⚠: Fire is a regular occurrence in this habitat particularly on Praslin island.</p>
Montane	↓	<p>⚠: The primary issue is the ongoing incursion of IAS (including introduced mammalian predators); more than three quarters of Seychelles' forests are dominated by invasive exotics.</p>
Palm		<p>⚠: Fire is a particular concern for palm forests on Praslin and Curieuse.</p> <p>⬆: The Valle-de-Mai and Fond Ferdinand areas are effectively managed for Palm forest habitats.</p>



	↔	<p>↗: Sustainable management of c-d-m initiative and the planting of a certain proportion of nuts each year.</p> <p>↘: Population demographics in the <i>L. maldivica</i> however indicate that there is currently insufficient recruitment into the population due to excessive nut harvesting and poaching.</p>
Riverine	↔	<p>↗: Long history of legal protection. Expansion of protected areas and general forest cover are assumed to have positive impact.</p>
Inselbergs	↔	<p>↗: Research Indicates that the temperature variation and aridity of this habitat are limiting to IAS incursion.</p>
<p><b>Notes:</b> There is a cross-cutting concern regarding the impact of climate change on rainfall patterns affecting moist/humid habitats, increasing forest fires in dry habitats and stressing native species to the potential further advantage of IAS.</p>		

## 1.2. Inland Waters Biodiversity

The geographically and evolutionarily isolated inland waters of the granitic Seychelles offer great scope for biodiversity interest yet despite this they are still relatively poorly studied. Inland waters in Seychelles can be divided into three categories: i) Rivers and streams, ii). Highland wetlands and iii). Lowland wetlands.

i). Rivers and streams. 146 water courses on the three main populated islands of Mahe, Praslin and La Digue are listed for protection under the State Lands and River Reserves Act (1976) in recognition of their importance for socioeconomic development. Increasing demand for water means that ever greater quantities of water are being extracted from the upper reaches of water courses with ramifications for downstream biodiversity. The lower reaches of watercourses in many regions have been affected by human activity including enrichment and chemical pollution, canalisation and reclamation of flood plains etc... A 2003 study of the lower reaches of 12 selected permanent water courses (7 on Mahé and 5 on Praslin) identified 12 native species of crustacea, including the endemic crab (*Seychellum alluaudi*) and 17 native species of fish including the endemic *Panchypanchax playfairii* and the discovery of a new endemic species *Parioglossus multiradiatus* (Valade, P. et al 2004). Additional work is required on more widespread watercourses and in their higher reaches to gain a better overview. Research on freshwater invertebrates is also required, the diversity of which may have previously been underestimated (Malicky, H. 1993 & 1995).

ii). Highland wetlands are a very specific habitat type in Seychelles being restricted to just three sites<sup>29</sup> that are well documented. All three sites were historically subject to extensive agricultural use and related species introduction but such activities have long since ceased. Rehabilitation work has been undertaken at the Mahé, Mare aux Cochons site which lies within the Morne Seychellois National Park and was designated a Ramsar site in 2010. The Silhouette site, also called Mare aux Cochons, lies within the Silhouette National Park (declared in 2010). The third highland wetland is La Plaine Hollandaise on Praslin Island, this area is currently unprotected by national legislation, though it has been earmarked for designation. Trends in these habitats, which are important for endemic biodiversity (see **Table 12** overleaf) and harbour unique biodiversity assemblages, can be considered stable but IAS incursion remains an ongoing issue for management attention. The recent UNDP EBA project advanced knowledge of highland wetlands by mapping of previously undescribed upland wetland areas, this includes a marsh on Montagne Planneau (upper Caiman River) which is currently unprotected and

<sup>29</sup> Mare aux Cochons on Mahé, La Plaine Hollandaise on Praslin and the Mare Aux Cochons on Silhouette.

several recently mapped on Praslin including Glacis Nwar which is in the National Park – unfortunately maps were not ready in time for inclusion in this report.

iii). Lowland wetlands were a characteristic feature of many of the original coastal plains of the granite islands. The coastal dune formations naturally created a simple basin-like structure to the landward that prevented free drainage resulting in the formation of extensive inland wetlands. These habitats were historically used for agricultural purposes such as rice production. However as agricultural patterns and development pressures changed these areas were increasingly drained to meet the demand for flat land and this trend has continued into the 21<sup>st</sup> century. Lowland wetlands can be considered the most severely threatened habitat type in Seychelles. It is estimated that some 90% of lowland wetlands in the central archipelago have been lost to reclamation since the colonisation of the islands in 1770. The largest remaining wetlands are Grande Barbe on Silhouette, Police Bay on Mahé and “La Mare Soupap” on the west coastal plain of La Digue. In 2010 Grande Barbe was, to a greater extent, incorporated into the Silhouette National Park, but it lies on the boundary adjacent to area that has been earmarked for tourism development. Police Bay on Mahe, which represents the last undeveloped, intact hydrological system on Mahé had been identified for tourism development but public protest has recently led to the cancellation of the proposal and the Government’s stated intention to designate it as a protected area (see **Map 13 Section II 1.8**). La Mare Soupap, although in part protected, lies in the centre of human development and habitation and hence faces diverse pressures and has been significantly canalised in recent years. Other smaller and vestige lowland wetland areas on populated islands in the central archipelago are subject to ongoing ad-hoc reclamation, canalisation and pollution meaning this habitat and its natural denizens are in a particularly perilous state. To counter this wetland creation and rehabilitation initiatives have been undertaken on some smaller islands such as North, Fregate and Aride. Since the 1990s wetland management has faced the additional challenge of IAS from the water hyacinth (*Eichornia crassipes*) and water lettuce (*Pistia stratiotes*) control programmes have been instituted but are costly and have yielded mixed results. Finally changing rainfall patterns – namely shorter more intense periods of rainfall – considered to be related to global climate change represent a key threat to the country’s future water supplies and the health and resilience of watercourse and wetland biodiversity.

**Table 12: Description and Status of Inland Waters Biodiversity**

(adapted from Nevill *et al* 2015).

Main Habitats	Typical/Key Species	Status
<b>Lowland wetlands</b>	<p><b>Flora:</b> i). Native: <i>Cyperus spp</i>, <i>Eleocharis dulcis</i>, <i>E. Variegata</i>, <i>Fimbristylis spp</i>, <i>Polygonum senegalense</i>, <i>Terminalia catappa</i> <i>Typha javanica</i>, etc...</p> <p>ii). Introduced: <i>Alocasia macrorrhiza</i>, <i>Eichornia crassipes</i>, <i>Ludwigia octovalvis</i>, <i>Nymphaea lotus</i>, <i>Pistia stratiotes</i>.</p> <p><b>Fauna:</b> i). Endemic: <i>Hypogeophis rostratus</i>, ii). Native: <i>Ixobrychus sinensis</i>, <i>Gallinula chloropus</i>, iii). Introduced: <i>Gyraulius mauritianus</i>, <i>Physella acuta</i>, <i>Ptychadaena mascareniensis</i>, <i>Trachemys scripta elegans</i> (Mahé only to date), <i>A. tristis</i>, <i>Felis cattus</i>, <i>Rattus spp</i>, etc...</p>	<p>Most threatened habitat type in Seychelles due to reclamation, drainage/canalisation. Estimated that more than 90% has been lost in the last 200 years and the trend is ongoing.</p> <p>Important habitat for endemic/indigenous biodiversity. Important habitat for diverse and abundant migrant birds. Increasingly important for research and ecotourism activities.</p>
	<p><b>Flora.</b> i). Endemic: <i>Allophylus sechellensis</i>, <i>Camposperma sechellarum</i>, <i>Canthium</i></p>	<p>2 of 3 three main documented sites lie in National Parks and the 3<sup>rd</sup> site is scheduled for protection. One site</p>

<b>Highland wetlands</b>	<p><i>sechellense</i>, <i>Gynura sechellensis</i>, <i>Mimusops sechellarum</i>, <i>Pandanus hornei</i>, <i>Randia lancifolia</i>, <i>Verschaffeltia splendida</i> etc..</p> <p>ii). Introduced: <i>A. macrophylla</i>, <i>C. verum</i>, <i>C. icaco</i>, <i>P. falcata</i>, <i>T. pallida</i>, <i>Clidemia hirta</i> etc...</p> <p><b>Fauna.</b> i). Endemic: <i>Trichoptera spp</i>, <i>diverse molluscan spp</i> - both endemic and indigenous<sup>30</sup> <i>Pachypanchax playfairii</i>, <i>Grandisonia spp</i>, <i>Sooglossus spp</i>, <i>Otus insularis</i> etc...</p> <p>ii). Introduced: <i>Rattus spp</i>, <i>M. musculus</i>, <i>T. ecaudatus</i></p>	<p>has been subject to rehabilitation management measures previously. Provides important habitats for endemic biodiversity</p> <p>Vital areas for water catchment capacity and maintenance.</p> <p>Increasing importance for ecotourism and scientific research.</p> <p>Previously undescribed upland wetland areas were recently mapped, including a marsh on Montagne Planneau (upper Caiman River) and several on Praslin including Glacis Nwar, unfortunately maps were ready in time for inclusion in this report.</p>
<b>Rivers and streams</b>	<p><b>Fauna.</b> i). Endemic: <i>Allolestes maclachlani</i>, <i>Ecnomus maheensis</i>, <i>Hughscotiella auricapilla</i>, <i>Leptocnemis cyanops</i>, <i>Oxyethira sechellensis</i>, <i>Praslina cooperi</i>, <i>Seychellum alluaudi</i>, <i>Pachypanchax playfairii</i>, <i>Parioglossus multiradiatus</i>, <i>Hypogeophis rostratus</i>, <i>Tachycnemis sechellensis</i> etc...</p> <p>ii). Native: <i>Caridinia spp</i>, <i>Macrobrachium spp</i>, <i>Septaria borbonica</i>, <i>Sesarmops impressum</i>, <i>Varuna litterata</i>, <i>Neritina gagates</i>, <i>N. Pulligera</i>, <i>Anguilla bicolor</i>, <i>Ardea cinerea</i>, <i>Butorides striatus</i>, <i>Nycticorax nycticorax</i> etc...</p> <p>iii). Introduced: <i>Gyrulus mauritanicus</i> <i>Poecilia reticulata</i>, <i>Lymnaea natalensis</i>, <i>O. mossambicus</i> etc...</p>	<p>Status of upper and mid-reaches of water courses has improved over the last 50 years with recovering catchment areas. Lower reaches are increasingly canalised and subject to enrichment pollution.</p> <p>Important habitat for endemic and indigenous biodiversity.</p> <p>Important habitat for diverse and abundant migrant birds.</p>

**Table 13: Trends in Inland Waters Biodiversity** (adapted from Nevill *et al* 2015).

Habitat	Trend	Notes
Lowland	↓	<p>↘: Physical change - reclamation, drainage/canalisation (to mitigate flooding but often also leading to salt water intrusion).</p> <p>↘: Pollution – illegal point source chemical in flow, general enrichment pollution are not alarming</p> <p>↗: The proposed protection of the Grande Police wetland is a major national advance.</p> <p>Considered the most endangered habitat type in Seychelles.</p>
Highland	↔	<p>↘: Ongoing incursion of IAS.</p> <p>↘: Current and potential future expansion of water extraction from the Mahé and Praslin sites.</p> <p>↗: Conservation management interventions at Mare aux Cochons, Mahé.</p> <p>↗: 2 of the 3 main sites now fall within National Parks.</p> <p>↗: Several smaller sites have recently been documented.</p>

<sup>30</sup> See Gerlach, J. (2006) for full current account.

Rivers and Streams	↔	<p>↘: Encroachment, canalisation and pollution particularly in lower reaches of watercourses.</p> <p>↘: Water extraction</p> <p>↗: Long history of river reserve management</p> <p>↗: Improved catchment management with increased forest cover and wider protection through Protected area network particularly in higher reaches of watercourses.</p> <p>General trend in lower reaches of watercourses is ↘ but is significantly ↗ in mid to upper level over the last 50 years.</p>
<p><b>Notes:</b> The impact of climate change on rain fall patterns, with heavier rain falling for shorter periods, affecting water supply, duration and flow rates is an issue the impacts of which have not been assessed.</p>		

## 2. Marine Biodiversity

The granitic islands originally supported populations of salt water crocodile; seals were found on the smaller granite and more isolated islands of the central archipelago and were abundant in the Amirantes. The coral reefs teemed with fish, rays and sharks; and the beaches supported huge rookeries of hawksbill and green turtle. These resources were exploited heavily by man on his arrival, supporting the human population by providing cheap high quality protein and commodities for trade driving the socioeconomic development of the colony. Today the coastal environment of Seychelles remains central to the country's development. The beautiful coconut and Takamaka fringed white sand beaches and crystal clear tropical blue waters provide the key basis for the tourism industry. Crocodiles and seals were early victims of human activity and were extirpated. Marine turtles supported prolonged exploitation that has drastically reduced their occurrence and abundance. Marine turtles received full protection under the law in 1994 but poaching remains an issue and their nesting habitat is unprotected outside of protected areas. Sharks a vitally important component in marine ecosystems were dramatically reduced in abundance on the Mahé plateau by a targeted fishery in the 1940s-1960s and the populations on the smaller banks of the outer islands soon followed suit. The rising commodity value of shark fin has maintained fishing pressure and the downward trend in shark populations continues. It has become increasingly apparent since the mid-1980s that the demersal fishery resources of the Mahé plateau are being overexploited. Initially it was considered a concern of the inner reefs but Vessel Monitoring System data coupled with steadily declining catches since 1991, indicate that the entire plateau is overexploited. This is particularly apparent in the decline of the occurrence, diversity and abundance of Serranidae on the Mahé plateau with several species now very scarce or absent from the catch. Declines are also apparent in key commercial species most notably the Emperor red snapper (*Lutjanus sebae*) and the Brownspotted grouper (*Epinephelus chlorostigma*).

The removal of so many key species, entirely or functionally, and the progressive fishing down of the food chain has a destabilising effect on the ecosystem with likely impacts upon: future productivity, coral reef recovery from the 1998 major bleaching event and reef resilience to climate change. Key steps however have been taken; all marine mammals and marine turtles have received complete legal protection since 1979 and 1994 respectively. Turtle rookeries in some key protected areas have shown significant and sustained population recoveries. There are management plans and approaches for various fisheries and Seychelles was amongst the first ten countries globally to

develop and commence implementation of a National Plan of Action for the Conservation and Management of Sharks.

The marine environment is central to Seychelles' development; artisanal, semi-industrial and industrial fisheries are key to the economy and local food security<sup>31</sup> and hence improved management of these activities and the ecosystems upon which they depend, is a priority for the country's sustainable development. This has been recognised and embodied by the national Marine Spatial Planning and Blue Economy Initiatives respectively.

**Table 14: Marine Biodiversity Overview** (adapted from Nevill *et al* 2015).

Taxa	No. of Species	Notes
Macroalgae	approx. 330	Rich species composition at most islands. Occurs in high density in nutrient rich waters off Port Victoria and certain seabird colony islands.
Alismatales (Sea grasses)	8 species	
Porifera (Sponges)	>350	351 species recorded. 135 sp exclusive to the granitics, 95 exclusive to the Amirantes and 121 sp shared. 14 species to date have been confirmed as endemic:
<b><u>Anthozoa</u></b>		
Sea Anemones	55 species	
Scleratinian corals	>200	Diversity greater around coral islands. At least 34 species are classified as Vulnerable or Endangered by the IUCN.
Octocorallian corals	>70	
<b><u>Molluscs</u></b>		
Gastropods	500	
Bivalves	>100	
<b><u>Crustacea</u></b>		
Shrimps	>165	At least 5 endemic species:
Macrura	7	Lobster fishery managed by periodic closures.
<b><u>Echinoderms</u></b>		
Crinoids	10	
Asteroidea	32	
Ophiuroidea	44	
Echinoidea	33	
Holothuroidea	43	43 species recorded including more than 20 commercial species. 6 species constituting the vast bulk of the catch.
Osteichthyes	>1,150	Endemism is low considered to be at about 1%. More than 400 coral reef associated species. Some 150 species (several of which are threatened) make up the artisanal fishery.

<sup>31</sup> Seychelles has one of the highest global per capita fish consumption indices with estimations varying between 65-75kg per annum.

Chondrichthyes	79	79 confirmed species of Chondrichthyan: 60 shark, 16 ray and 3 guitarfish species. Of the 71 identified to species level 30 are threatened (i.e. Vulnerable or Endangered) and 15 are Data Deficient.
Chelonii	5	Hawksbill ( <i>E. imbricata</i> ) and Green ( <i>C. mydas</i> ) turtles nest in Seychelles though much reduced from historical numbers. The Leatherback ( <i>D. coriacea</i> ), Loggerhead ( <i>C. caretta</i> ) and Olive Ridley ( <i>L. olivacea</i> ) turtles occur in Seychelles waters.
Mammals Cetaceans	27	Including the Endangered Sei, Blue and Fin Whales ( <i>Balaenoptera borealis</i> , <i>B. musculus</i> & <i>B. physalus</i> ), and eight species of dolphin. There is a small but apparently increasing population (approx. 20-25) of the Dugong ( <i>D. dugong</i> ) at Aldabra atoll.
Sirenia	1	

i). Beach Crest and Beach. The beach, beach crest and adjacent low lying coastal land are of vital importance to Seychelles. The topography of the granitic islands means the coastal plateaux are usually narrow strips of flat land making them subject to the stereotypical SIDS pressure of “coastal squeeze”. Economically these habitats provide the basis for and appeal of the country’s tourism industry. Socially this area is also vitally important being the centre of human leisure and cultural activity on the main populated islands. The beach dune, adjacent plateau and the beaches themselves are consequently amongst the most disturbed habitats, with vegetation of most sandy shores<sup>32</sup> in Seychelles having been severely modified. Direct human disturbance is further complicated by what are considered to be the impacts of climate change as evidenced by increasing coastal erosion and more intense storm surges.

This habitat is vital for nesting turtle populations (*Chelonia mydas* and *Eretmochelys imbricata*) but whilst turtles have received full protection under the law since 1994 protection of nesting habitat outside of Protected Areas is lacking. The habitat is also vital for wading birds (native and migratory), various species of nesting sea bird (see **Table 15**), and diverse crab species.

ii). Rocky Shore is the most common shore habitat in the granitic islands and is typified by a limited vegetation structure consisting of species such as *Hibiscus tiliaceus*, occasional stands of the endemic Balfour’s pandanus (*Pandanus balfouri*), *Scaevola sericea*, creepers (e.g. *Ipomea pes-caprae*) and grasses. In their natural state and particularly on promontories and rocky islets rocky shores historically supported important seabird populations and and/or roosts (e.g. *Sterna anaethetus*, *Phaethon lepturus*, *Puffinus pacificus*) such as can still be found on reserve, and mammalian predator free, islands like Aride, Cousin, Cousine and Recif.

The intertidal zone is rich in gastropods some of which are commonly exploited for food (e.g. *Patella exusta* and *Cellana radiata*). The trochus *Monodonta australis* and the majority of Seychelles Nerites (*Nerita albicilla*, *N. plicata*, *N. polita*, *N. textilis*) are common in this zone; as are various species of Littorinid (*Littorina kraussi*, *L. scabra*, *L. undulata* and *Peasiella roepstorffiana*). *Planaxis sulcatus* occurs in large colonies in this zone, the Morulas, *Morula granulata* and *M. uva* are also common and the cowrie *Cypraea caputserpentis* is common in rocks clefts typified by strong wave action. Rocky shores also harbour large crab populations (*Grapsus* and *Geograpsus* spp) and occasionally the distinctive chiton, *Acanthopleura brevispinosa*.

<sup>32</sup> For a thorough investigation of man’s impact upon coastal vegetation see **Sauer 1967**.

Accessible rocky shores are quite intensively harvested for shell fish for both domestic and commercial use and increasingly physical development is encroaching in these areas to meet the demand for seaside properties.

iii). Mudflats and Mangroves. The original mangrove forests on the East coast of Mahé were rapidly cleared after human settlement and the resulting mud flats progressively reclaimed to meet the need for flat buildable land. Mangroves were also harvested for timber and for bark, for example on Aldabra, well into the 20<sup>th</sup> Century. Total natural mangrove area continued to decline through much of the 20<sup>th</sup> Century but has been considered relatively stable since the 1980s at approximately 25km<sup>2</sup>. The various phases of land reclamation on the east coast of Mahé have served to create lagoons where a limited mangrove flora (dominated by *Avicennia marina* and *Rhizophora mucronata*) and fauna has re-colonised, these areas are however subject to repeated and significant disturbance. Despite this the habitat supports populations of crabs, molluscs and fish and hence provides important habitat for native heron species and migratory wading birds.

Eight species of mangrove naturally occur in Seychelles (see **Table 15**). The mangrove fauna is characterised by limited species diversity when compared to its continental counterparts. In the central archipelago today mangroves are rather restricted; the last continuous belt exists between Port Launay and Port Glaud on the west coast of Mahé. Curieuse supports a diverse mangrove area on its west coast and Praslin retains a few isolated mangrove areas around river mouths; other very small areas occur on other islands such as Cousin. In the outer islands mangroves are only found in atoll environments, which provide the sheltered lagoon habitat suitable for their establishment. The most extensive forests are found in Aldabra, Cosmoledo and Astove.

Mangrove habitat management has received considerable attention over the last 25 years with the development of management projects and ecotourism (boardwalks and canoeing) activities. Notably the Port Launay mangroves were incorporated into the Morne Seychellois National Park providing for protection of a watershed from mountain top to mangrove forest. The importance of this area was highlighted by its 2004 designation as a Ramsar site.

The main threats to mangroves are coastal development and climate change with rising sea levels posing a significant threat to mangrove forests in the Seychelles.

iv). Sea Grass Beds. The extensive shallow submarine banks of Seychelles support significant sea grass areas (See **Maps 24-28**). A particularly large sea grass bed (estimated at 45km long and 15km at its widest) lies on the Providence-Cerf bank. Many of the outer islands, such as the lagoons of Aldabra, Cosmoledo and Astove, support large sea grass communities. Sea grass habitats are also common around the granitic islands notably in the St Anne Marine National Park and off Grand Anse-Amities coast of Praslin. A brief survey of inshore sea grass bed substrate around the island of Mahé recorded 58 species of infaunal invertebrates. Sea grass beds are also essential for many marine herbivore species including megafauna such as the green turtle and the Dugong. There is evidence that sea grass beds around the main populated islands are in decline due to a combination of anthropogenic factors – pollution, reclamation, coastal development and climate change. It is also likely that the historical exploitation of the main sea grass grazers, green turtles, and ongoing fishery activities mean that the natural grazer/growth balance in sea grass beds has been lost potentially leading to changes in community structure and health.



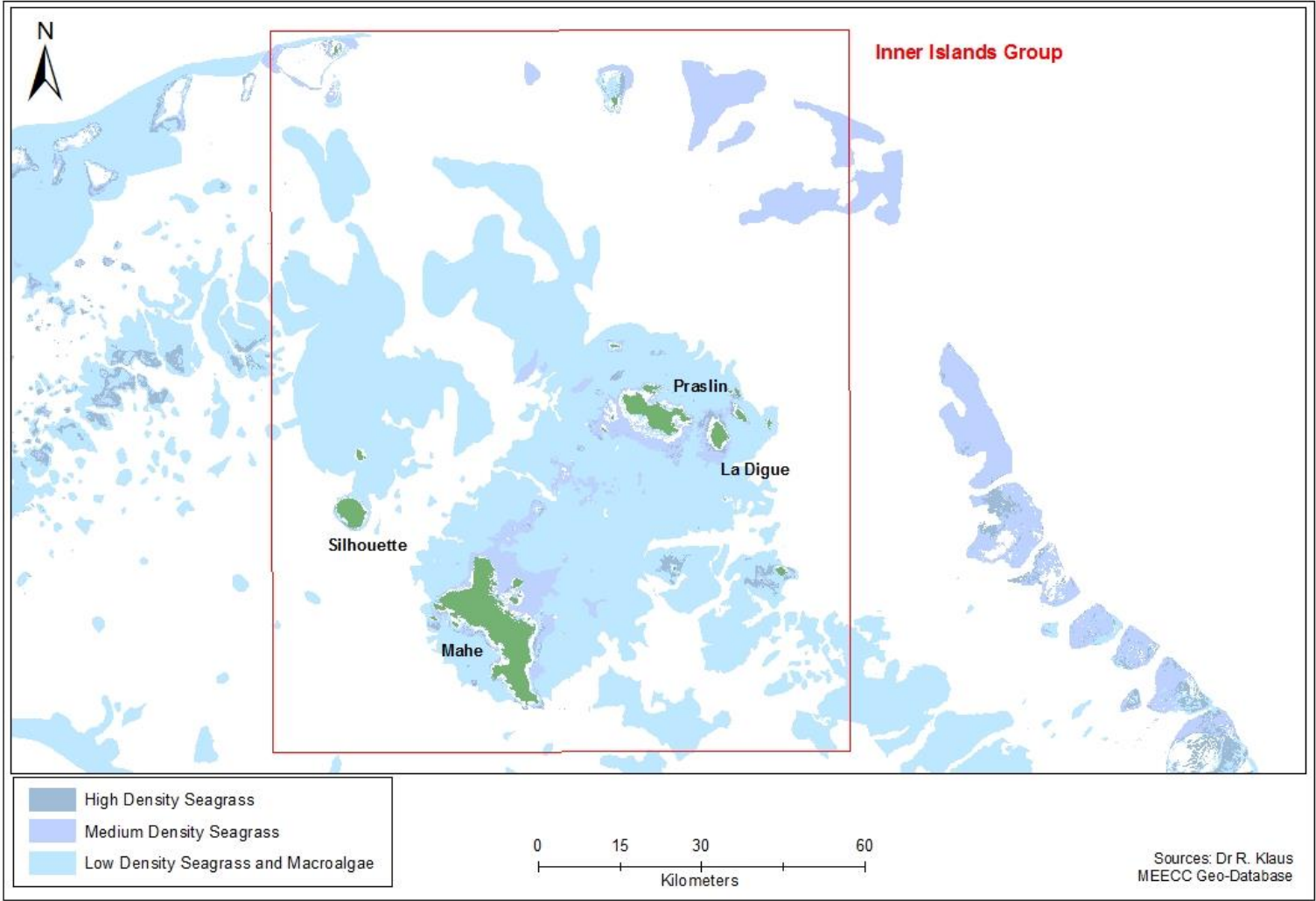
**Table 15: Description and Status of Marine and Coastal Biodiversity**  
(adapted from Nevill *et al* 2015).

Main Habitats	Typical/Key Species	Status
<b>Beach Crest &amp; Beach</b> (and open or grassland interiors of coralline islands)	<b>Flora:</b> i). Native: <i>Scaevola sericea</i> , <i>tournefortia argentea</i> , <i>Pemphis acidula</i> , <i>Sideroxylon inerme cryptophlebia</i> , <i>C. inophyllum</i> , <i>Cordia subcordata</i> , <i>T. catappa</i> , <i>Hernandia nymphaefolia</i> , <i>Guettarda speciosa</i> etc... ii). Introduced: <i>Cocos nucifera</i> , <i>Casuarina equisetifolia</i> . <b>Fauna:</b> <i>Atactodea striata</i> , <i>Coenobita spp</i> , <i>Donax spp</i> , <i>Birgus latro</i> , <i>Ocypode spp</i> , <i>Eretmochelys imbricata</i> , <i>Chelonia mydas</i> (nesting habitat), wading/coastal birds etc... <u>Sea bird colonies:</u> <i>Onychoprion fuscata</i> , <i>Sula dactylatra</i> , <i>S. Leucogaster</i> , <i>Anous stolidus</i> , <i>Puffinus pacificus</i> , <i>Phaethon lepturus</i> , <i>Hydroprogne caspia</i> , <i>Thalasseus bergii</i> , <i>Sterna dougalli</i> , <i>S. sumatrana</i> etc...	Subject to extensive and widespread development and diverse and intensive human activity on populated islands. Increasingly heavily modified with growing problem of coastal erosion believed to be climate related. Important habitat for diverse and abundant migrant birds. Beaches are a vital socioeconomic asset.
<b>Rocky shore</b>	<b>Flora:</b> i). Native: <i>Pandanus balfouri</i> , <i>H. tiliaceus</i> , ii). Introduced: <i>C. nucifera</i> , <i>Casuarina equisetifolia</i> . <b>Fauna:</b> <i>Grapsus spp</i> , <i>Geograpsus spp</i> , <i>Littorina spp</i> , <i>Cellana cernica</i> , <i>Tetraclita spp</i> , <i>Nerita spp</i> , <i>Chitonidae</i> , <i>Blennidae</i> , <i>Sterna anaethetus</i> , <i>Phaethon lepturus</i> , <i>Puffinus pacificus</i> ...	Growing development and intensive harvesting of shell fish on populated islands. Important habitat for sea and shorebirds.
<b>Mudflats and Mangroves</b>	<b>Flora:</b> <i>Avicennia marina</i> , <i>Bruguieragymnorhiza</i> , <i>Ceripostagal</i> , <i>Lumnitzeraracemosa</i> , <i>Rhizophoramucronata</i> , <i>Sonneratia alba</i> , <i>Xylocarpusgranatum</i> , <i>X. moluccensis</i> etc... <b>Fauna:</b> <i>Terebraliapalustris</i> , <i>Bivalvia spp</i> : <i>Gafrariumtumidum&amp;pectinatum</i> , <i>Ctenadivergens</i> etc... <i>Littorinascabra</i> , <i>Cardisomacarnifex</i> , <i>Scylla serrata</i> , <i>Geograpsus spp</i> , <i>Metopograpsus spp</i> , <i>Sesarma spp</i> , <i>Uca spp</i> etc... <i>Periopthalmuskalolo</i> , <i>P. argentineatus</i> , <i>Fregata spp</i> , <i>Ardeacinera</i> , <i>Butoridesstriatus</i> , wading bird species.	Though significantly reduced from historical occurrence mangals are now stable or recovering in most areas where they occur. Mudflats have been lost to/alterd by reclamation on east coast of Mahé. Important habitat for migrant birds.
<b>Sea grass</b> (Maps 24-28)	<b>Flora:</b> <i>Cymodocearotundata</i> , <i>C. serrulata</i> , <i>Enhalusacocroides</i> , <i>Haloduleuninervis</i> , <i>Halophilaovalis</i> , <i>Syringodiumisoetifolium</i> , <i>Thalassodendronciliatum</i> , <i>Thalassiahemprichii</i> . <b>Algae:</b> <i>Caulerpa spp</i> , <i>Codium spp</i> etc... <b>Fauna:</b> Diverse invertebrates e.g.: polychaete worms, amphipods, molluscs, crustacea, bivalves (e.g. <i>P. muricata</i> , <i>Gastropods</i> , <i>C. moneta</i> , <i>C. tigris</i> , <i>Strombus spp</i> , <i>Morula margaritcola</i> etc... Grazing species e.g. <i>Siganus spp</i> . <i>Chelonia mydas</i> , <i>Eretmochelys imbricata</i> .	There is evidence of decline in nearshore sea grass beds around the main populated islands. Data on offshore sea grass beds is lacking but the collapse of green turtle populations is likely to have a negative impact.
<b>Reef flat</b>	<b>Fauna:</b> <i>Bursa bufonia</i> , <i>B. cruentata</i> , <i>Cerithiumzebrum</i> , <i>Conus leopardus</i> , <i>C. litteratus</i> , <i>C. virgo</i> , <i>C. betulinus</i> , <i>C. quercinus</i> . <i>Cypraea annulus</i> , <i>C. Lynx</i> , <i>C. caurca</i> , <i>C. helvola</i> . <i>Rissoinaambigua</i> , <i>R. plicata</i> . <i>Smaragdianrangiana</i> . <i>Strombusgibberulus</i> , <i>Holothuridae</i> , lobster, octopus.	Important for coastal protection and migrant birds. Important for gleaning fishing practitioners and as a leisure resource.
<b>Coral Reef</b> (Incl: reef ridge, slope, patch reefs etc)	<b>Fauna:</b> 23 species of <i>Scaridae</i> , >30 species of <i>Serranidae</i> , >20 species of <i>Lutjanidae</i> , <i>Amphiprion fuscocaudatus</i> (endemic), <i>Octopus</i> , lobster <i>spp</i> , <i>Eretmochelys imbricata</i> , more than 400 coral species. Numerous mollusc <i>spp</i> (including <i>Cypraea helvola</i> , <i>C. histro</i> etc...). Diverse elasmobranch populations > 35 species.	Severely degraded by 1998 bleaching event (>90% loss of live coral). Important habitat for biodiversity. Important for fishery & tourism/recreation.
	Sea cucumber <i>spp</i> . ( <i>Holothuria nobilis</i> , <i>H. fucogilva</i> , <i>H. fuscopunctata</i> , <i>H. atra</i> , <i>H. edulis</i> , <i>H. scabra</i> etc...) <i>Carangid</i>	

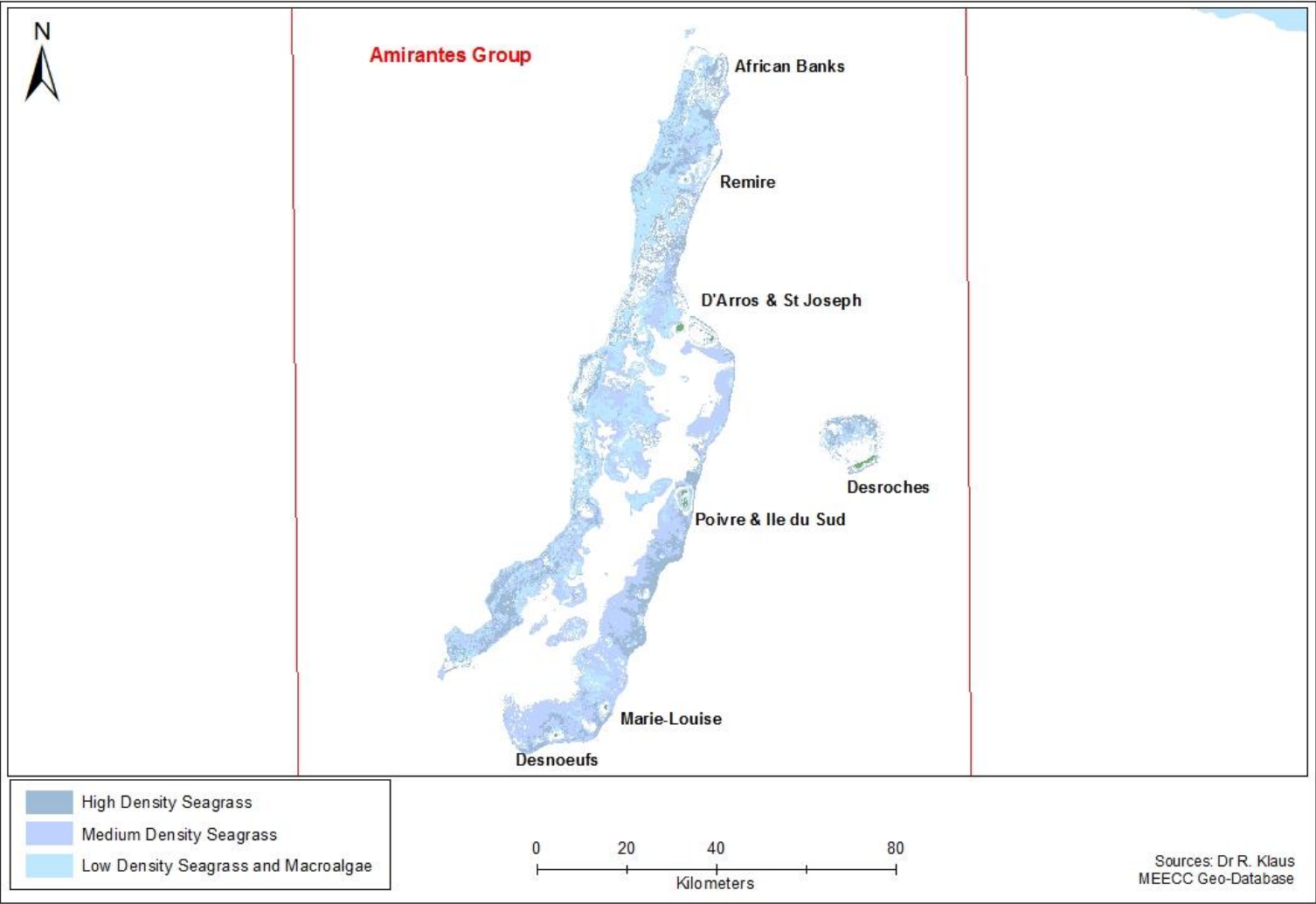


<b>(Mahé) Plateau</b>	<i>spp (Trevally and Bludger), Lutjanid spp (e.g. Lutjanus sebae,) Lethrinids, Serranids etc...elasmobranch spp: C. leucas, C. limbatus, C. plumbeus, Galeocerdo cuvier, Sphyrna spp, Mobula specie,, Aetomylaeus vespertilio etc</i>	Strong evidence of wide scale overfishing of demersal resources on the Mahe Plateau.
<b>Pelagic</b>	<p>Tuna <i>spp (Katsuwonus pelamis, Thunnus albacores, T. obesus, T.alalunga etc...)</i>. Billfish (<i>Xiphias gladius, Makaira spp, Tetrapturus audax, Istiophorus platypterus</i>).</p> <p>Shark <i>spp (Prionace glauca, Carcharhinus falciformis, C. longimanus, Isurus spp, Sphyrna spp, Carcharodon carcharias, Rhincodon typus etc...)</i>. Manta <i>birostris</i></p> <p>Turtles: <i>Chelonia Mydas, Dermochelys coriacea, Caretta caretta, Lepidochelys olivacea</i>.</p> <p>Seabirds: <i>Sterna bengalensis, S. caspia, Onychoprion fuscata, Sula dactylara, S. leucogaster, Macronectes giganteus etc...</i></p> <p>Marine Mammals: 27 species of cetacean have been recorded in Seychelles waters including: <i>Megaptera novaeangliae, Physeter macrocephalus etc...</i></p>	Management of semi-industrial and industrial fisheries is a major challenge, reduced effort due to piracy impact appears to have enabled some stock recovery. By-catch issues require urgent substantive measures but are currently large neglected.
<b>Deep Sea Bed</b>	Limited Data.	

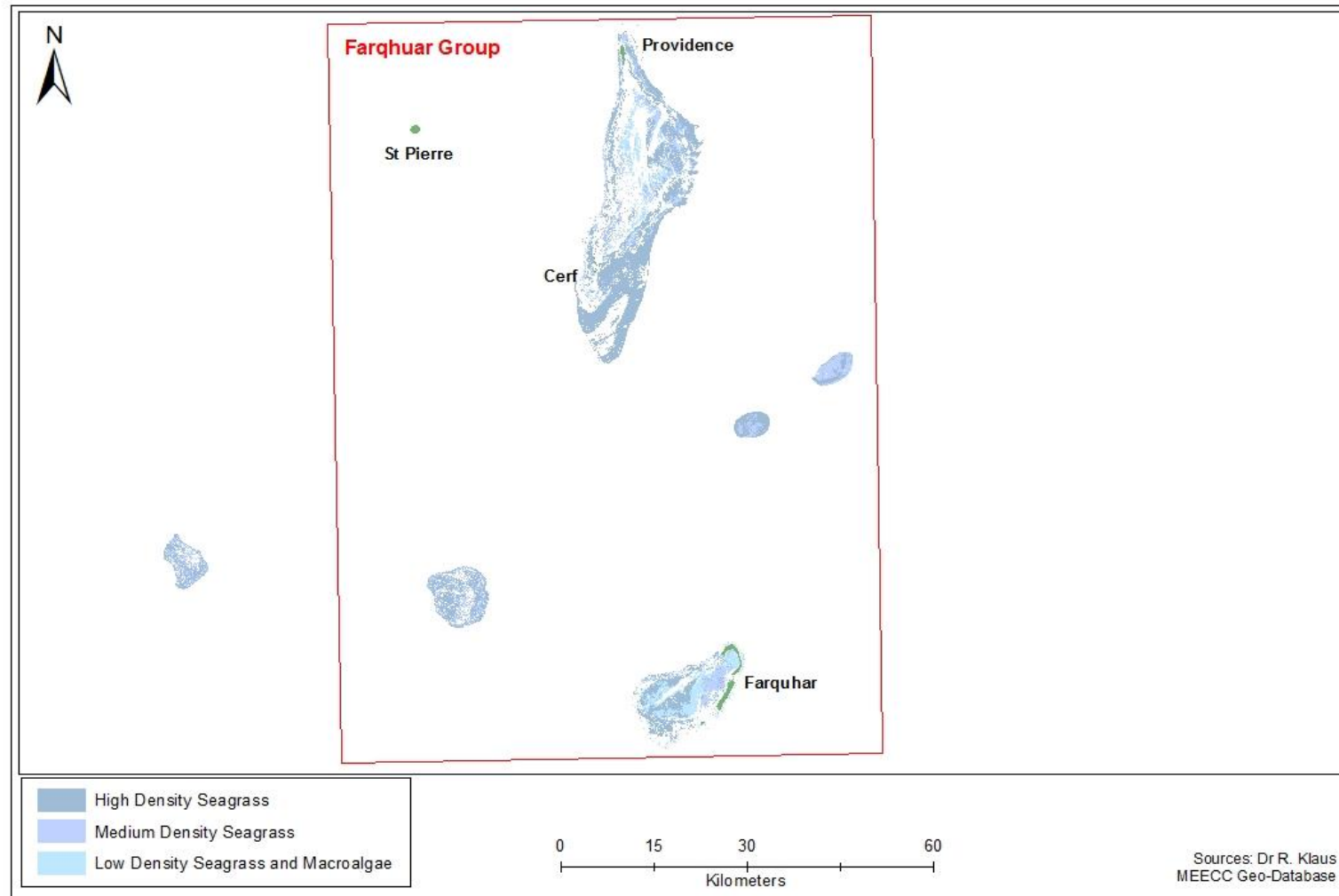
Map 24. Inner Islands Seagrass Map



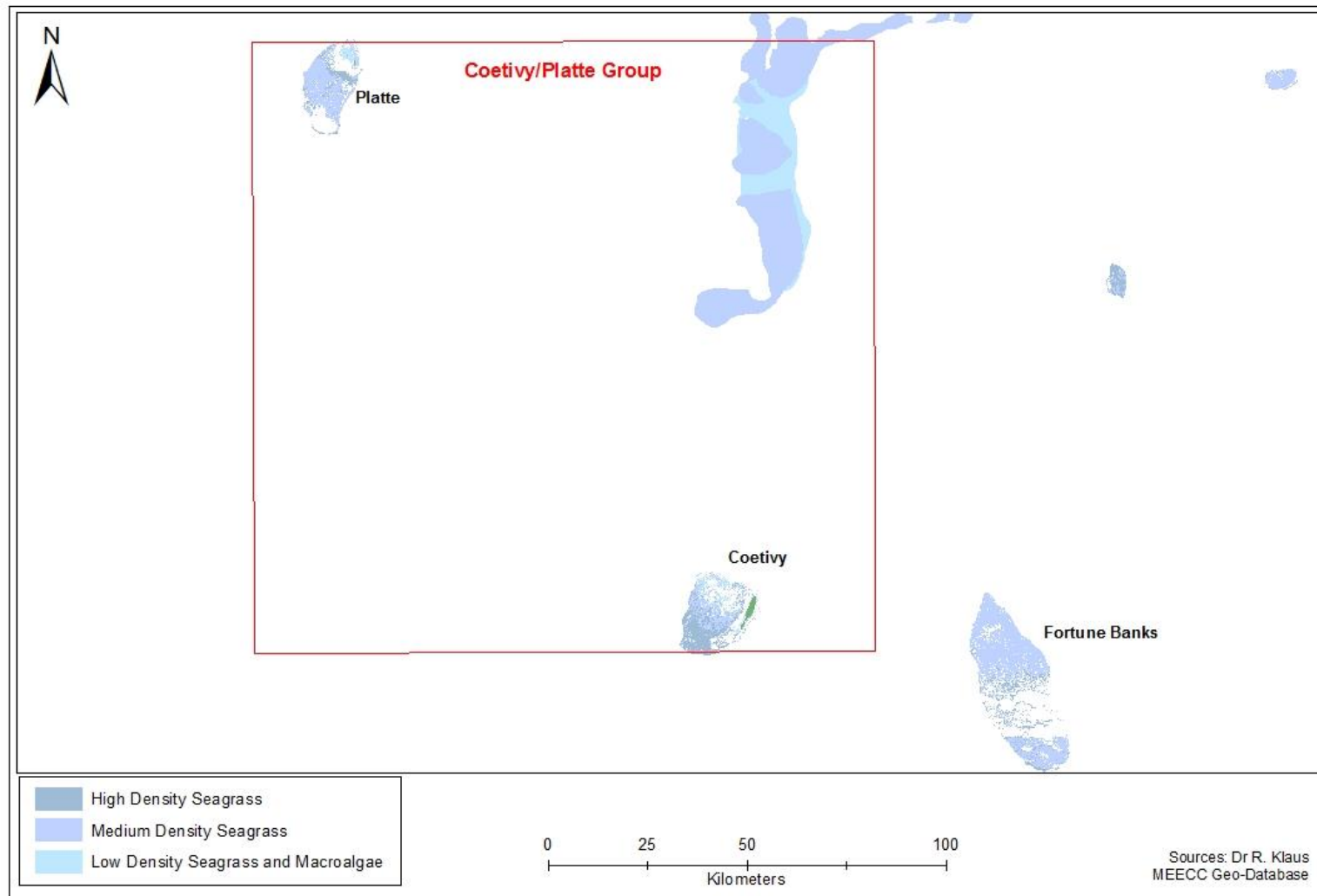
Map 25. Amirantes Groups Seagrass Map



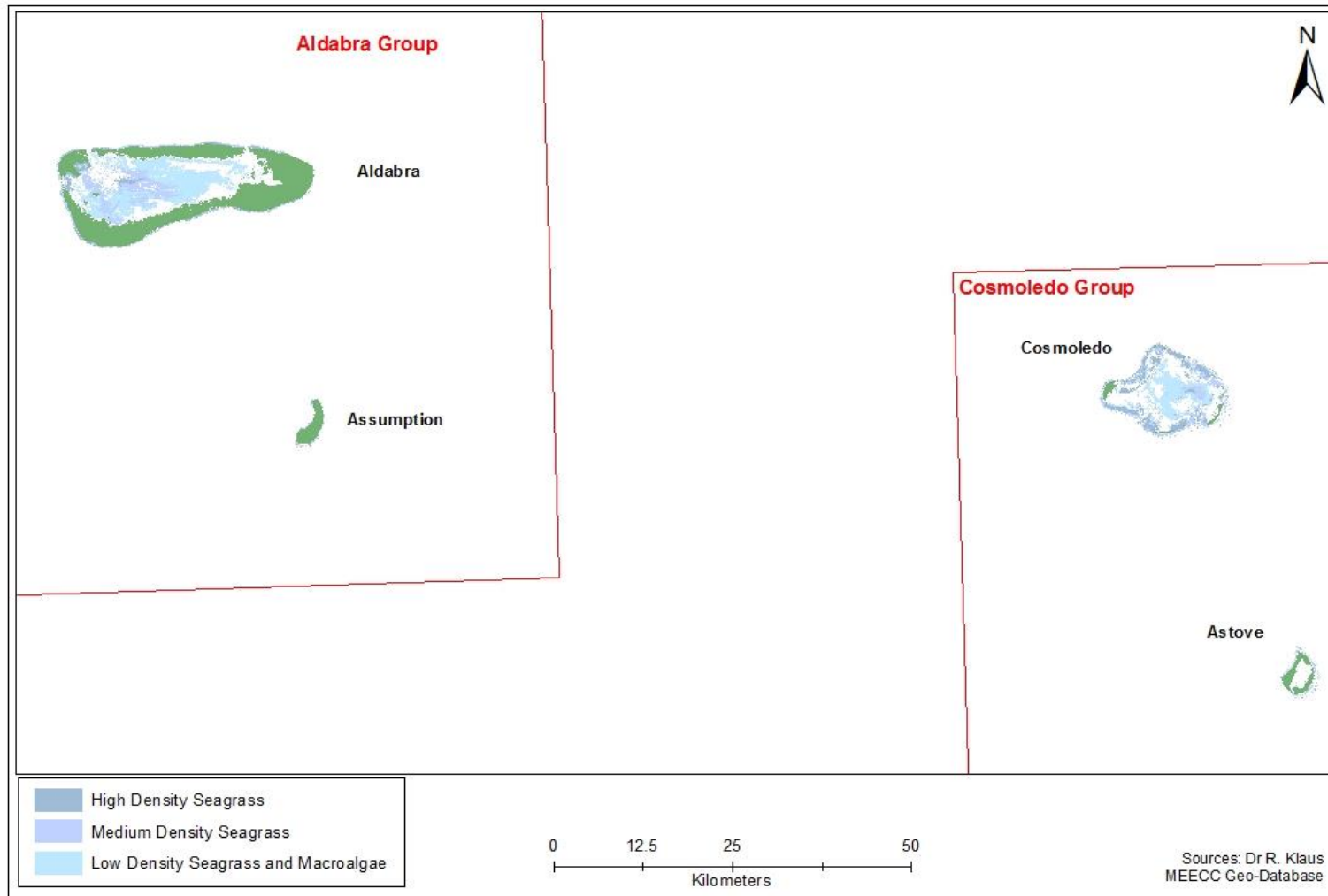
Map 26. Farquhar Group Seagrass Map



Map 27. Platte-Coetivy Group Seagrass Map



Map 28. Aldabra and Cosmoledo Groups



v). Reef flats. This mixed habitat complex has been subject to intensive disturbance around populated islands. In the central archipelago reef flats are utilised extensively for gleaning fisheries (e.g. octopus and shell fish) and shell collecting activities. In the last 30 years significant areas of this habitat have been lost to major land reclamations. Sedimentation and in some areas pollution are also factors of concern.

Most reef flats consist of a complex patchwork of habitats: areas of sand and gravel interspersed between areas of coral rubble, coral outcrops, sea grass and algal growth. In their natural state these habitats are rich in life and commodity species such as octopus, lobster and sea cucumber. Mollusc fauna can be very rich with Cowries (*Cypraea moneta*, *C. annulus*, *C. Lynx*, etc... being common), Cones (*Conus leopardus*, *C. litteratus*, *C. virgo*, *C. maldivus*, etc...) readily found in the seagrass; whilst species such as *Bittium zebrum* and *Smaragdia rangiana* can be found in algal mats. Four Shell Reserves were declared in the 1960s and were subsequently incorporated under the 1986 Fisheries Act (1987 Shell Reserve Regulations) but the areas are not managed or enforced. Reef flat areas are also covered in other Protected Areas most notably Aldabra.

vi). Coral Reefs. It is estimated that Seychelles has some 1,700 km<sup>2</sup> of coral reef (Nevill *et al* 2015) with the vast majority occurring around the south western islands (see **Maps 29 & 30**). Analysis of recent Vessel Monitoring System data however, shows significant fishing effort throughout the Mahé plateau indicating that coral occurrence is far more extensive than thought in particular in the mid-regions of the Mahé plateau.

The ENSO-related coral bleaching event in 1998 had a major impact on Seychelles' reefs. Prior to 1998 the coral reefs of Seychelles exhibited good live coral cover, rugosity and reef community diversity. The reefs in 1994 were characterized by high cover of live branching and massive coral, soft coral, and high structural complexity (Graham *et al* 2006). This changed however with the global mass bleaching event of 1998, where the severe El Nino event of that year interacted with Indian Ocean dipole (Saji *et al* 1999, Goreau *et al* 2000) resulting in devastating coral bleaching and death of 70-99% of live coral cover in the Western Indian Ocean (Goreau *et al* 2000). The reefs of the central Seychelles were the most severely affected globally with over 90% mean loss of live coral cover (Graham *et al* 2006 & 2015)<sup>33</sup>. Fast growing Acroporas and Pocilloporas suffered most and a phase shift from live coral cover to coral rubble/macroalgae dominated-reefs was initiated in many areas.

The average hard coral cover in the reefs around the central archipelago before the bleaching event was 28% and macroalgal cover was 1% (Graham *et al* 2015) which fell into the average range for the Indian Ocean region at that time (Ateweberhan *et al* 2011). An extensive survey of 78 reef sites around the central archipelago (Engelhardt 2004) recorded mean percentage cover of scleractinian hard corals at 3%, 4.8% and 7.5% for November 2000, and Jan/Feb 2002 and 2003 respectively. Survey of 48 of the sites conducted in Jan/Feb 2004 recorded an average of nearly 10% hard coral cover indicating a slow but accelerating recovery.

A separate survey in 2005 (Graham *et al* 2006), however, recorded slower coral progress stating average coral cover was 7.5% with only 1% of the benthos consisting of fast growing habitat

<sup>33</sup> The outer islands were in general less badly affected with coral mortality more in the region of 40-50% and it has been postulated that this may reflect greater resilience due to reduced anthropogenic stress and an existing natural adaptation to greater temperature fluctuations.

forming corals, whereas macroalgae cover had increased 7-fold to dominate many of the carbonate reefs. This was summarised as the coral reef system of the inner Seychelles having undergone a widespread phase shift to a rubble and algal-dominated state. This was found to have resulted in a striking decline in corallivores and planktivores reliant on live coral for food and shelter (**Graham *et al* 2006 & 2007**) including the possible extirpation of 4 fish species and the reduction to critically low levels of another 6 (**Graham *et al* 2006**). The phase shift was also connected to decline in abundance of juveniles (<30cm) in the reef-fishery assemblage that would ultimately lead to a decline in adult abundance with broad ramifications for fishery catch and ecosystem stability (**Graham *et al* 2007**) – a further complicating factor in the assessment of fishery catch and over-fishing for the latter half of the first decade of the 21st century.

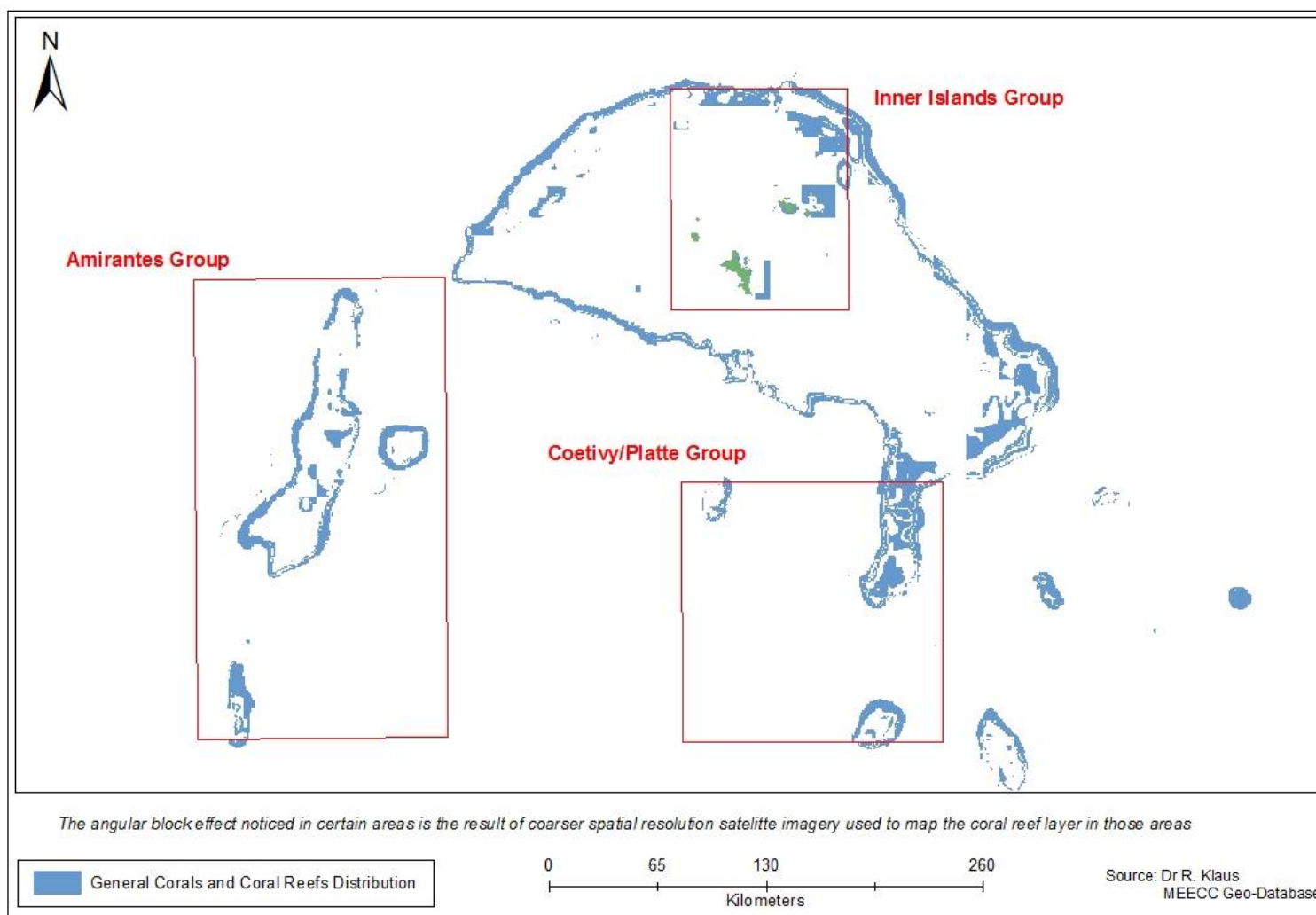
In 2010, 21 carbonate fringing reefs around the inner Seychelles were surveyed to investigate the relationship between benthic composition and associated fish assemblages (**Chong-seng *et al* 2012**). High variability was found with a gradient from high coral cover, of up to 58%, with high structural complexity to high macroalgae cover of up to 95% and low structural complexity. The gradient from high coral cover and rugosity reefs to macroalgal dominated low rugosity reefs was associated with a decline in species richness, fish functional groups and abundance of corallivorous fishes. **Graham *et al* 2015** noted that both hard coral cover and macroalgal cover had steadily increased from previous studies in 2005-2011, and a significant proportion of formerly coral-dominated reefs had continued on to macroalgal dominated systems. Of the 21 reefs surveyed, 12 followed a post-bleaching recovery trajectory, with live coral cover increasing through time to an average of 23% by 2011, macroalgal cover remaining low (<1%), and benthic composition moving towards that observed in 1994. In contrast, 9 of the 21 reefs followed a trajectory with average macroalgal cover steadily increasing to 42% by 2011, coral cover remaining low (<3%), and benthic composition diverging from the pre-bleaching state.

A key issue in the initial slow recovery from the 1998 bleaching event is the isolation of the Seychelles (**Engelhardt 2004, Graham *et al* 2006**). Coral death was so extensive in the central archipelago that there was very little healthy coral remaining to serve as a source of recruitment and other sources were many hundreds of miles away. This indicates that isolated reef systems like those around the central archipelago may be more susceptible to climate change despite being less exposed to other stressors, such as those impacting continental coral reefs, due to isolation from coral brood stocks that would enable recruitment (**Graham *et al* 2006**).

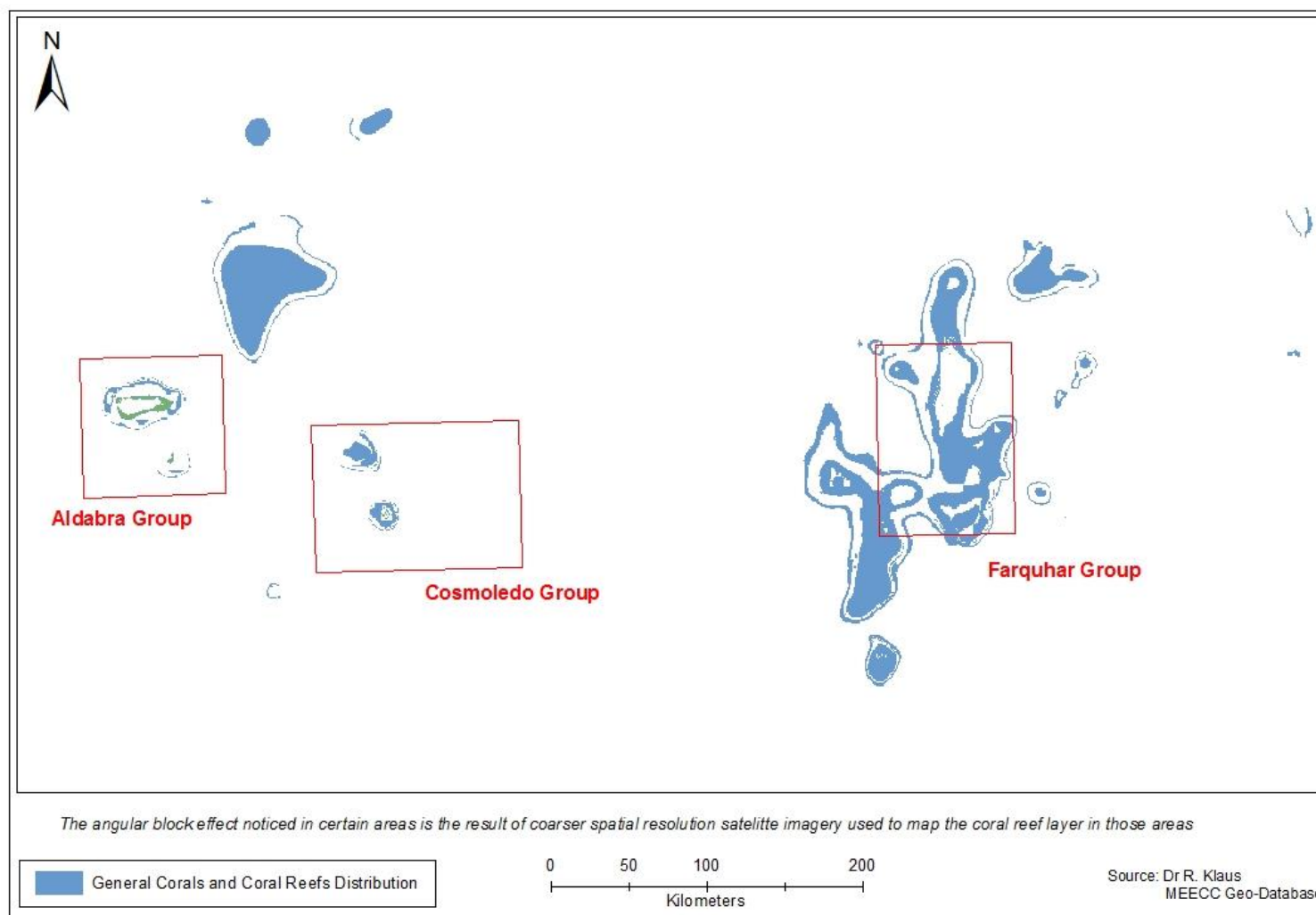
There is clear evidence in Seychelles that coral bleaching can lead to regime shift from structurally complex coral reefs with diverse fish communities to structurally limited macroalgae systems supporting depauperate fish communities (**Chong-seng *et al* 2012**) and that there may be limited scope for recovery from the macroalgae dominated state (**Graham *et al* 2006**).

General climate trends suggest that raised sea-temperature events will occur with increasing regularity in the future and as such temperature induced coral bleaching remains a primary threat to coral reefs and their wider recovery in the Seychelles. Indeed since 1998 there have been further bleaching events in Seychelles in 2002, 2003, 2010 and 2016 that have set back natural recovery. This scenario is further complicated by the spectre of acidification and its potential to: inhibit coral recruitment (**Doropoulos *et al* 2012**), the building of calcium carbonate based structures and impact upon the larval stage and development processes of many species.



**Map 29. Coral Reef Distribution in Inner Islands, Amirantes and Coetivy Group**

**Map 30. Coral Reef Distribution in Outer Islands (Aldabra, Cosmoledo and Farquhar Groups)**



vii). Marine Plateau.

The submarine banks of the Seychelles form the basis of the artisanal fishery providing vital food security, employment and high value trade commodities. The Mahé plateau is of particular importance. This shallow bank of some 39,000 km<sup>2</sup> supports important demersal fisheries such as: *Lethrinidae*, *Lutjanidae*, *Scaridae*, *Serranidae*, *Siganidae* some 150 species of demersal fish are commonly caught in the fishery. Also important are the sea cucumber, lobster and octopus fisheries (see **Section II 1.3 and Section III ABT 6**).

Prominent trends in marine and coastal biodiversity are summarised in **Table 16** below:

<b>Table 16. Trends in Marine and Coastal Biodiversity</b> (Adapted and updated from <b>Nevill et al 2015</b> )		
Habitat	Trend	Notes
Beach Crest and Beach	↓	⚠: Increasing coastal development (tourism developments and private habitations). ⚠: Increasing intensity of human activity. ⚠: Resource harvesting and poaching. ⚠: Coastal erosion/ rising sea level.
Rocky Shore	↓	⚠: Increasing development. ⚠: Resource exploitation. ↔: Significant areas still relatively inaccessible by land.
Sea Grass	?	⚠: Evidence of localised decline in inshore grass beds around main populated islands due to reclamation, siltation and pollution. ? : Insufficient data on large offshore sea grass beds to provide baseline – though removal of/dramatic reduction in key grazer species (e.g. <i>Chelonia mydas</i> ) suggest likely destabilisation.
Reef Flat	↓	⚠: Extensive land reclamation on the main granitic islands. ⚠: Excessive disturbance, utilisation and increasing pollution.
Coral Reef	↓	⚠: Ongoing loss of rugosity and phase shift in extensive areas following 1998 bleaching event. ⚠: Bleaching events 2002-03, 2010, 2016 inhibiting recovery. ⚠: Stresses include widespread overfishing, sedimentation near main populated islands and physical damage are significant factors. ⚠: Reclamation.
Mudflats and Mangroves	↔	↗: Direct exploitation of mangroves has ceased and some localised natural expansion in area has been noted. ↗: Mangrove recolonisation of the east coast of Mahé. ⚠: Mangroves and mudflats on Mahé east coast are disturbed and subject to periodic clearance and pollution events.
Mahé Plateau	↓	⚠: Expanding effort, range & sophistication of fishing pressure. ⚠: Ongoing habitat degradation (see habitats above). ⚠: Ongoing decline in megafauna with impact on ecosystem structure and function: e.g. shark and large grouper population decline. ⚠: Ongoing decline of mesopredators <i>Serranidae</i> , <i>Lutjanidae</i> etc...
Pelagic	↓	↗: Total protection of cetacean population in EEZ and wider Indian Ocean Whale Sanctuary. ⚠: Significant and ongoing reduction in shark populations. ⚠: Cause for concern in various large predator populations subject to the industrial tuna fishery by catch.
Deep Sea Bed	?	No data.

**Main pressures on and drivers of change to biodiversity (direct and indirect):**

**Table 17** overleaf, sets out the main threats to Seychelles' biodiversity, the drivers behind these threats and the likely implications if these issues are not effectively addressed. To broadly summarise however:

i). In Terrestrial Ecosystems the primary threat is posed by IAS in particular in terms of the intermediate, montane and palm forest habitats which harbour the highest level of endemism. The secondary threat is change in land use or habitat loss and this particularly prevalent in coastal habitats such as lowland forest and most dramatically for lowland wetlands where development pressures threaten the last remaining examples of this habitat. A cross-cutting threat for all terrestrial ecosystems is the projected impacts of climate change and how it may “squeeze” habitats and species niches which have little scope for movement/migration in the very limited landmass of the islands.

ii). In Marine Ecosystems over-fishing constitutes the primary and most immediate threat and in particular with regard to demersal stocks where there is strong and clear evidence of decline in many species and collapse of some populations, particularly of megafauna – e.g. primary herbivores (green turtles) and primary and secondary predators (elasmobranchs and serranids). Climate change is again a cross-cutting and complicating factor. In Seychelles the prolonged raised sea temperatures in 1998 caused severe and extensive coral bleaching and death in Seychelles resulting in some 90% and 50% loss of live coral cover in the central archipelago and outer islands respectively. Recovery from this bleaching has been patchy and hindered by four subsequent bleaching episodes. Issues of changing currents and shifts in seasonal weather patterns may have significant impacts upon the occurrence and distribution migratory and pelagic species with potentially damaging ramifications for conservation and sustainable use. Raised levels of atmospheric carbon dioxide a key driver of global climate change is also driving acidification of marine environments which is a longer term threat to marine biodiversity. Finally the ongoing exploration for oil and its potential future exploitation pose significant risks for biodiversity on the Mahé plateau and beyond.

**Table 17. Threats to Biodiversity** (Adapted and updated from Nevill *et al* 2015)

Ecosystem type	Threats	Direct and Indirect Drivers of Threats	Implications
<b>Forest Biodiversity</b>	Invasive Alien Species	Change in land use. Increased trade & tourism. Lack of public awareness on horticultural introductions. Lack of capacity and techniques to address existing IAS problems in key areas of endemic biodiversity. (i.e. montane forest 200-500m asl). Capacity lacking in border control and inter-island movements.	Degrading biodiversity, decline in environmental service provision, and loss of future development potential.
	Fire	Human activity. Climate Change.	Loss of forest cover, facilitation of IAS spread, increase of erosion and sedimentation, decline in environmental services.
	Disease	Increase of disease linked to IAS pests. Climate Change?	Loss of economic resources, diversion of limited resources to address disease outbreak.
<b>Inland Waters Biodiversity</b>	Drainage/Canalisation	Economic development Lack of planning, management and enforcement capacity.	Loss of biodiversity and environmental services, increased sedimentation in marine environment.
	Sedimentation	Change in land use, deforestation. Lack of management capacity	Decline in water quality and related loss of biodiversity and environmental services.
	Pollution	Economic development Lack of awareness Lack of management capacity	Decline in water quality and related loss of biodiversity and environmental services.
	Invasive Alien Species	Lack of awareness	Loss of biodiversity & environmental services.
<b>Marine and Coastal Biodiversity</b>	Over Exploitation	Economics Insufficient management measures and capacity. Inappropriate incentives.	Unsustainable exploitation of resources, large future income loss and impact on livelihoods. Increased and potential further phase shift in some habitats. Destabilisation of ecosystem, increased occurrence of disease and plague organisms (e.g. COTS)
	Pollution	Economic development Oil exploration and extraction. Lack of management capacity	Impact upon localised coastal habitats and production (much broader threat of oil shipping and exploration).
	Coral Bleaching	Climate Change, Sedimentation, pollution, over exploitation etc...	Economic loss in artisanal fisheries and tourism industry, rise in cost of living, potential for ecosystem phase shift and increased coastal erosion.
	Sea Temperature change	Climate Change	Change in currents and nutrient input, change in occurrence and distribution of pelagic resources, change in weather patterns, increased frequency of coral bleaching events.
	Sea Level Change	Climate Change	Loss of biodiversity, coastal erosion, potentially disastrous impact as economic activity and human habitation focused on coastal plains.
	Sea Acidification	Climate Change	Change in coral calcification rate, impact on shell formation, coral recruitment and planktonic phase of many species.

### **Measures to enhance implementation of the Convention**

#### **Implementation of the NBSAP.**

The Republic of Seychelles received a GEF enabling activities grant to develop its NBSAP in 1997. The second iteration was developed in 2014 with UNDP-GEF funding and was one of the first NBSAPs to be aligned with the Aichi Biodiversity targets. The NBSAP was designed to be a living document with an open-ended steering and review mechanism, including a process to develop new and retire old approved implementation projects.

Unfortunately various delays have been experienced in the establishment of the strategic oversight for, and implementation of, the NBSAP. This includes significant delays to form an NBSAP coordination unit within the Ministry of Environment, an element that the NBSAP identified as a critical success factor.

There has as a consequence been an absence of a strategic approach or national coordination to the implementation of the NBSAP to date. The NBSAP has however been implemented through various sectoral approaches and other national undertakings such as the Marine Spatial Planning Initiative (see **Section II** for implementation initiatives) as well as the NBSAP Partnership Forum.

#### **Overall actions taken to contribute to the implementation of the Strategic Plan for Biodiversity 2011-2020:**

Approximately 47% of land is protected for environmental reasons in Seychelles and 4% more has been identified for designation. As of 2018 15% of Seychelles waters (National and EEZ) have been designated as protected and the process is ongoing to designate 30% of waters by 2020. All marine mammals and marine turtles have had complete legal protection since 1979 and 1994, respectively, and there are management plans and management approaches for various fisheries. Seychelles was also amongst the first countries to develop and commence implementation of a National Plan of Action for the Conservation and Management of Sharks.

Forestry policy has, in particular amongst sectoral approaches, seen a fundamental shift within the last 20 years, taking its emphasis from timber production to biodiversity conservation. It is possible however with the planned financial independence of the Seychelles National Parks Authority that this emphasis may shift again in the future. Agricultural Policy 2003-2013 seeks to reduce environmental and biodiversity impact from its activities by lowering artificial chemical input, conserving soil and reducing water consumption by the application of biodiversity-friendly technologies.

Invasive Alien Species are being addressed by the formation of the new National Biosecurity Agency and the second iteration of the National IAS strategy and Action Plan.

The Coco-de-Mer (*Lodoicea maldivica*) threat from international trade, due to the curio and supposed medicinal value of its nut in certain markets, has been addressed by a thorough census of productive trees, the legal requirement for the registration and certification of nuts for sale and export. A sustainable harvest and re-planting regime has also been developed and initiated.

An Access and Benefit Sharing Bill that seeks to protect Seychelles' rights to its genetic diversity has been drafted and effort has been made to record and catalogue traditional knowledge, in particular with regard to the applications of medicinal plants.

See **Section II** for details on a wider range of implementation initiatives.

**Support mechanisms for national implementation (legislation, funding, capacity-building, coordination, mainstreaming, etc.):**

The primary strategic mechanism for the integration of environmental concerns into socioeconomic sectors in Seychelles was intended to be the Seychelles Sustainable development Strategy (SSDS 2012-2020) but this has proven unsuccessful as a national coordinating approach and has consequently been shelved with a new National Development Strategy being mooted to fill the void. . Biodiversity is also integrated into the development cycle by two primary legal mechanisms: the Town and Country Planning Act (TCPA) (1972), and the Environment Protection Act (EPA) (1994) with its Environmental Impact Assessment Regulations (1996). The Acts working together provide the approval mechanism and conditions for developments through the Planning Authority.

Seychelles is also Party to the Convention on Migratory Species, CITES and the Indian Ocean Southeast and Asian Sea Turtle Agreement.

**Mechanisms for monitoring and reviewing implementation:**

In all aspects of biodiversity conservation, enhanced monitoring and assessment of key components of biodiversity is required to enable and facilitate effective management regimes.

The National Institute for Science, Technology and Innovation has been established to assist in this regard.

## APPENDICES

### **1.0 GENDER AND BIODIVERSITY REPORT**

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# GENDER AND BIODIVERSITY REPORT

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### Terminology

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3. Gender linkages to utilization of Biodiversity resources and sharing of  
Benefits
4. Conclusions
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Nature Seychelles, SIF, GIF, SeyCCAT, SFA, SNPA, Tourism Department, The Gender Secretariat, PCU-UNDP Seychelles, TRASS, MCSS, GVI, S4S, The Ocean Project and Seychelles Agricultural Agency, The National Biosecurity Agency.

## Terminology

**Gender** The term gender refers to the social roles and relations between women and men. This includes the different responsibilities of women and men in a given culture or location. Unlike the sex of men or women, which is biologically determined, the gender roles of women and men are socially constructed and such roles can change over time and vary according to geographic location and social context.

**Gender Equality** entails the concept that all human beings, both men and women, are free to develop their personal abilities and make choices without the limitations set by stereotypes, rigid gender roles, or prejudices. Gender equality means that the different behaviours, aspirations and needs of women and men are considered, valued and favoured equally. It does not mean that women and men have to become the same, but that their rights, responsibilities and opportunities will not depend on whether they are born male or female.

**Gender Mainstreaming** involves ensuring that attention to gender equality is a central part of all environmental and sustainable development interventions, including analyses, policy advice, advocacy, legislation, research, and the planning, implementation, monitoring and evaluation of programmes and projects.

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<https://www.cbd.int/gender/decisions/terminology.shtml>

## 1. BACKGROUND AND CONTEXT

The Seychelles archipelago is globally recognized, as one of Earth's biodiversity hotspots. Biodiversity is the foundation of our livelihoods, cultural beliefs and basic survival. The population of Seychelles stood at 98,055 as of December 2019, indicating a growth rate of 0.9% over 2018 (National Bureau of Statistics, 2019), this however does not reflect the population demography of the native population only as Seychelles also has a large population of especially expat male workers.

In recent years, the country has reached important milestones through gender transformative efforts and biodiversity conservation. Seychelles has embraced gender issues in all aspects of sustainable development. The Constitution (1993) provides for individual rights and freedoms as well as protection against discrimination based on race, colour, sex, creed, place of origin, or political opinions. The Seychellois Charter of Fundamental Human Rights and Freedoms (Chapter 3 of the Constitution), incorporates many of the principles of international human rights whereby 25 rights are equally provided to both men and women.

As part of Seychelles' commitment to attaining gender equality, the country has made significant progress through agriculture, politics, economics, or conservation — new programs geared towards empowering women are surfacing at country level. It is worth noting that the country observes both International Men's and Women's Day.

Women and Men alike have benefited from equal opportunities such as education and employment. There has been greater recognition that gender intersects with a variety of other social factors and therefore must be considered within larger frameworks.

Gender is anchored in numerous country commitments and instruments such as the Convention on the Elimination of all forms of Discrimination against Women (CEDAW, 1979) and the Millennium Development Goals (MDGs, 2000). These documents highlight that gender equality is more than just a fundamental human right and is key towards all development settings. They recognize that the contributions of both women and men in society are important and valuable.

In 2013, Seychelles ranked second out of 52 African countries for gender equality based on a number of gender-focused programmes implemented.

From grassroots to the policy making level the representation of women is very important. Seychelles women have challenged harmful social norms and their participation in politics and decision-making spheres has risen significantly.

The important role of women in natural resource conservation and management is well known. It is evident that with different labour responsibilities, decision-making power, and knowledge, women and men use and manage these resources uniquely.

Some sectors such as agriculture, fisheries, construction and solid waste collection remain male preferred jobs whilst women lack or have no interest of doing these jobs. In comparison, women tend to be strong stakeholders and experts in sustainable management of protected areas, specialists in plant and wildlife conservation, sustainability, education and awareness, tourism, administration and policy making processes.

Despite the many achievements, many challenges persist and slows down national progress towards more actions to address gender issues in different sectors. The Gender Secretariat based at the Ministry of Family Affairs identifies gender-based violence and teenage pregnancy as challenging issues. Statistics show that 356 family violence cases were registered before the respective tribunal in 2019, 8 cases more than the previous years. The victims identified were mostly women and girls (Seychelles News Agency, 2019).

The following report examines how gender equality considerations successfully ensures that appropriate mainstreaming of gender is included in all development sectors linked to biodiversity in Seychelles. In addition, it provides an overview of the implementation of the 2015-2020 CBD Gender Action Plan and looks at how men and women utilize biodiversity resources.

## **2. IMPLEMENTATION OF CBD 2015-2020 GENDER PLAN OF ACTION**

The Convention on Biological Diversity (CBD) recognize the links between advancing gender equality and effectively meeting the Convention's goals. It recognizes that parties have to invest considerable effort in order to effectively integrate gender issues into all policy designs, project planning and implementation. As party to the Convention, Seychelles is fully

supportive of these objectives and has developed and implemented various projects and programmes to effectively achieve them.

The country believes that addressing gender issues and empowerment of women working in biodiversity conservation or related sectors will lead to more effective management and sustainable use of biodiversity resources hence contribute towards improved ecological results. This is especially important as women's representation is high in many Government and Non-Government Organizations.

## **DELIVERY**

The NBSAP (2015-2020) was endorsed by the Cabinet of Ministers in July 2015 with 20 objectives developed and 31 projects to be implemented over a 6-year duration. The number of parties to the convention that have made mention to women and or gender considerations in their NBSAPs has fluctuated over the years (Clabots & Gilligan, 2017). However, Seychelles is one of the 67 countries with no mention of gender and or women keyword in its NBSAP. Nevertheless, Seychelles does recognize biodiversity as a crosscutting socio-economic issue and therefore has a broad and complex stakeholder community.

With an active conservation NGO community, Civil Society Organizations and different Ministries, a team of 16 stakeholder organizations provided guidance during the NBSAP process.

The NBSAP steering committee membership comprised of 7 women and 12 men and contributors to the overall process involved 47 men and 33 women.

In addition, Seychelles has made progress towards achieving Aichi Target 14 "That recognizes women as key stakeholders in projects, programmes, policy development and biodiversity conservation and sustainable use.

Different sectoral efforts have focused on addressing structural inequalities and harmful social norms through different processes and practices especially within human resource issues such as hiring, training, pay, and promotion of women.

## **POLICY INSTRUMENTS AND FRAMEWORKS**

There is in place an institutional framework for the mainstreaming of biodiversity into the country's development sectors. This reflects the national governance response to address gendered development challenges.

The Republic of Seychelles is a signatory party to legally binding human rights treaties which focus on the promotion of gender equality and advancement of women such as the Convention for the Elimination of All Forms of Discrimination against Women [CEDAW], its Optional Protocol, and the SADC Protocol on Gender and Development.

The Seychelles National Development Strategy 2019 – 2023 highlights the need to ensure equal learning opportunities for all and inclusive development processes, promoting poverty reduction and gender equality in line with the 2030 Agenda for Sustainable Development.

Seychelles developed its National Gender Policy, which came into effect in 2016. The consultation and research process highlighted the fundamental areas of development and implementation to effectively address gender issues across and beyond sectors.

The overarching goal of the policy is “To provide national guidelines for institutionalizing and operationalizing gender as an integral component of our sustainable development” with the objective to “Ensure the mainstreaming of gender perspectives into all policies, structures, systems, programmes and activities in order to make them gender responsive and contribute to the effective achievement of sustainable socio-economic and political development”.

Being the first of its kind for Seychelles, the Policy echoes the values of the constitution for equal opportunities for all and promotes greater understanding of the impacts of gender issues on society and that the successful realisation of this policy will require active participation from all sectors. It additionally recognizes that gender is not just about women and explores the social constructed roles of men in society and within organisations as well.

Issues such as climate change, sustainable development and disaster risk management, agriculture and fisheries are reflected in the policy, however the document lacks specific reference to Gender and Biodiversity. In fact, there are no key words mentioning biodiversity. It does recognise synergies in integrating gender in work to address climate change, land degradation and desertification. It recognizes the importance of women's participation in climate / environmental decision-making processes. Importantly the policy recognizes that

women are important change agents and have a strong body of knowledge and expertise that can be used in climate change mitigation, disaster reduction and adaptation strategies.

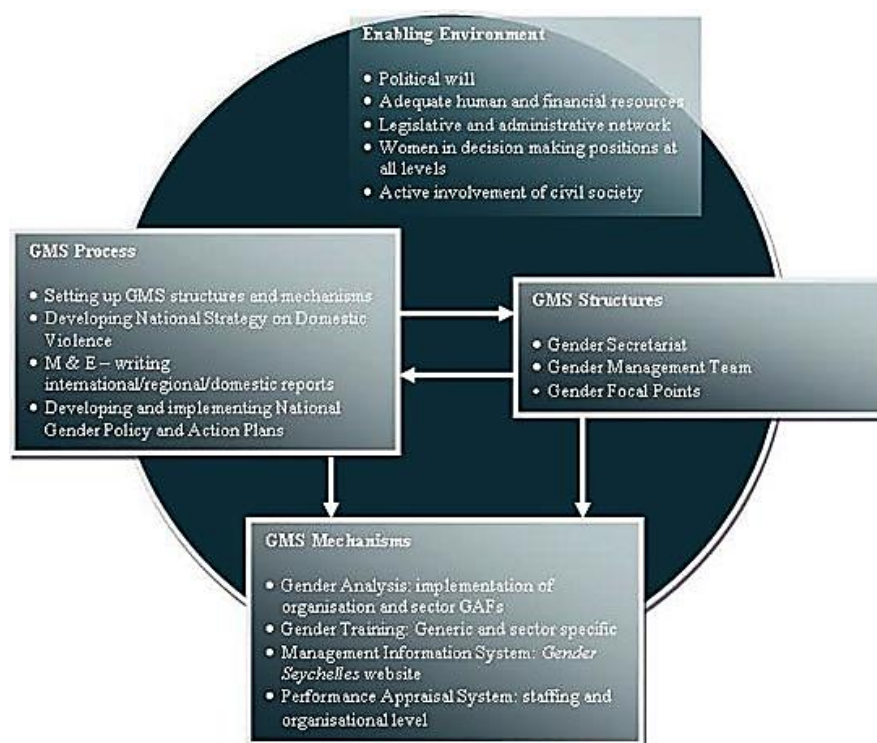
This does not mean that biodiversity considerations have not been taken into account. The interlinkages between biodiversity, climate change, and sustainable development are critical. Despite not specifically being mentioned in the policy, stakeholders at the national level are aware that biodiversity, through the ecosystem services it supports, makes important contribution to both climate-change mitigation and adaptation.

A Plan of Action (2019- 2023) based on the Policy was finalized in May 2019 but has not been launched yet.

## **ORGANIZATIONAL STRUCTURES**

The Gender Secretariat is based at the Family Affairs Department, Ministry of Family Affairs. One of the key issues identified is that whilst the conditions of women and men have changed, i.e. women being economically more active and educated, their position has not changed much. The Department highlights that the needs and concerns of women, men, girls and boys must be incorporated into all our policies, programmes and activities.





Source: Gender Secretariat, Ministry of Family Affairs; Gender Management System in Seychelles

A balanced workforce is a productive one. Information collected by the National Bureau of Statistics shows that for the past four years, local and expatriate male workers have dominated the Parastatal Sectors, whilst local female workers have dominated the Government Sectors.

**Table 1: Average monthly employment for local and expatriate workers in Parastatal and Government Sectors from 2016-2019**

	Parastatal				Government			
	Local		Expat		Local		Expat	
	M	F	M	F	M	F	M	F
<b>2016</b>	3193	3063	861	16	2817	5780	231	161
<b>2017</b>	3375	3351	805	31	3488	6091	246	173
<b>2018</b>	3397	3294	805	27	3531	6374	349	230
<b>2019</b>	3500	3415	943	38	3460	6354	381	234

Source: National Bureau of statistics

**Table 2: Males and Female workers in key Government and Non-Government Organizations linked to biodiversity conservation in Seychelles**

Organization	No of Males	No of Females
<b>GOVERNMENT</b>		
Ministry of Environment, Energy and Climate Change	<b>50</b>	<b>63</b>
Ministry of Tourism	<b>13</b>	<b>34</b>
The National Biosecurity Agency	<b>27</b>	<b>32</b>
<b>NON GOVERNMENTAL</b>		
Seychelles Islands Foundation	<b>26</b>	<b>43</b>
Green Island Foundation	<b>2</b>	<b>2</b>
Island Conservation Society	<b>12</b>	<b>10</b>
Seychelles National Parks Authority	<b>61</b>	<b>32</b>
Nature Seychelles	<b>16</b>	<b>9</b>
Marine Conservation Society Seychelles	<b>11</b>	<b>4</b>
GVI ( volunteers)	<b>4</b>	<b>7</b>
TRASS ( volunteers)	<b>700</b>	<b>900</b>
Sustainability for Seychelles ( S4S) Active members only	<b>7</b>	<b>5</b>
SEYCAAT	<b>0</b>	<b>4</b>
The Ocean Project ( volunteers)	<b>11</b>	<b>22</b>

In Seychelles, women are more engaged in environmental sustainability and dominate in some specific sectors such as administration and in middle management in many organisations. MEECC has 9 females and 3 males working in Administration whilst The Tourism Department have 4 women and 3 men in administration.

National efforts to train and employ more girls/women in the environment sector have gained momentum. Recognition of the critical importance of biodiversity has attracted many women and men alike to join organisations working in that field.

Biodiversity policy and programming have been seen as important entry points for women's empowerment. Women hold key leadership positions in both Government and Non-Government Organizations. In fact out of the 10 current Ministers, 5 are women. The Legal officer at the Ministry of Environment, Energy and Climate Change is a woman. Women head the two divisions within the Environment Department, including the Biodiversity Conservation and Management Division. A number of female CEOs are effectively leading their Non-Government organizations towards success including the Seychelles Islands Foundation (SIF), Seychelles Conservation and Climate Adaption Trust (SeyCCAT), Island Conservation Society

(ICS) .The Programme Coordination Unit (PCU) coordinator is a women. In addition, Project Manager positions are or was occupied by women. For example, The Marine Spatial Planning (MSP), Access and Benefit Sharing, Ecosystem Based Adaptation, Outer Islands Protected Areas are all women. Furthermore, Focal points for key biodiversity conventions and instruments are women and this includes the CBD, CMS, CITES, IUCN.

It has also been observed that participation of women and or girls most of the time exceed male representation in environment related volunteer programmes such as beach clean ups, school wildlife clubs and eco schools.

Despite the rise in women leaders, some leadership roles have always been male dominated. For example, all four Presidents of Seychelles to date have been men, of the 33 members of the National assembly only 7 are women. And Seychelles has only had one female Minister for Environment to date.

Biodiversity conservation roles especially on islands are often dominated by male staff due to specific daily roles such as boat operators and wardens/rangers due to the challenging conditions that exist on islands, especially policing islands to prevent illegal activities such as poaching. That does not mean women do not work in these conditions, in fact many of the NGOs encourage women to join their team. In some organizations women already occupy these posts and have proven their proficiency.

## **BEST PRACTICES**

Advancing gender considerations is important for the mainstreaming of gender equality in environmental conservation. The recognition of women as key stakeholders across and beyond sectors is critically important.

Seychelles has received two awards from the African Union ( AU) on its Gender Scorecards. The first award won in 2016, was in recognition of the country's progress in economic rights for women (Seychelles News Agency, 2016). In 2019, the country received a 2<sup>nd</sup> award under the category 'Implementation of anti-corruption policies' of the Gender Scorecard, where the theme for 2018 was "Winning the fight against corruption: a gender sensitive path for the transformation of Africa" (Department of Foreign Affairs, 2019). The award signified the

measurable progress the country has made in integrating gender equality and women's empowerment into efforts to fight corruption on the continent of Africa.

Since, 2018 the GOS-UNDP-GEF Programme Coordination Unit (PCU) within the Ministry of Environment is required, to report on Gender, more specifically on “progress in Advancing Gender Equality and Women's Empowerment” (PCU, 2019). PCU, UNDP Seychelles, through the UNDP Global ABS Project organized a workshop on Gender Reporting on GEF and donor funded projects in 2019.

The Green Island's Foundation (GIF) is an NGO that developed gender specific indicators as part of the progress report of their project “The development of a co-management plan, designed by fishers, to minimize the impact of the Seychelles artisanal fishery on threatened species”. They also had a gender mainstreaming plan and gender integration checklist to enable participation of both men and women at all stages of the project such as natural resource management, capacity building and knowledge sharing and decision making powers.

The Ministry of Agriculture and Fisheries has developed a Fisheries Comprehensive Plan (2019), that aims to encourage more young girls and women to become fishers. They will be working closely with Government to extend the “My First Job” scheme to encourage more women in the field.

SeyCCAT, an all-female organization is tracking its allocation of blended finance that empowers women and girls. Out of the 13 projects the organization is funding 7 are led by women or women-based organizations. One of the projects involves doing a socio-economic survey of the artisanal fishery.

Nature Seychelles “an equal opportunity employer/NGO” has developed a Gender Policy as part of their Administrative and Staff Handbook. Furthermore, the NGO encourages women to take on traditionally male roles ,such as driving the boats, on Cousin Island.

The Wildlife Clubs of Seychelles are school-based clubs where 90 per cent of the club leaders are women. The clubs provide opportunities for young people to learn about their environment. The programmes and activities include tree plantings, wetland education and conservation, art and many more.

The Ministry of Environment, Energy and Climate Change and its partner NGOs raise awareness and mobilise people on biodiversity conservation regularly by organising various

related thematic forums and activities to highlight key issues involving biodiversity. The common goal is that every individual has a role in biodiversity conservation .

### **3. GENDER LINKAGES TO UTILIZATION OF BIODIVERSITY RESOURCES**

Generally, men play a greater role than women in the exploitation of natural resources for commercial purposes whilst women are actively involved in processes to conserve and sustainably use biodiversity.

Activities such as fishing and farming are no longer men's job, women in Seychelles and the world are contributing towards food security. They participate in economic opportunities and decision-making. The fact remains that although a lot is being done to encourage more women to work in male dominated fields such as agriculture, fisheries, forestry, construction etc, more work needs to be done

#### **Fisheries**

Pulling of nets and fighting rough seas is the stereotype often associated with fisheries. Fishing has always been a male-dominated industry whilst women have mostly been involved in post-harvest and non-sea related tasks such as seafood processing. 251 Fishermen and 5 fisherwomen are registered at the Seychelles Fisheries Authority. Twenty-four women and eighty-nine men are registered with SFA as boat owners (SFA 2019).

Women are generally very active in the protection and conservation of the ocean.

#### **Forest Based livelihoods and resources**

##### **Agriculture**

Women are increasingly taking on responsibility for managing small-scale agriculture and bring different perspectives and new solutions to addressing food security.

Whilst commercial agriculture is a male dominated sector and most of the state land allocated for agricultural production is leased to male entrepreneurs many women take on roles as home backyard gardeners.

419 male farmers and 145 female farmers are registered with the Seychelles Agricultural Agency (SAA, 2019).

Agricultural skills and knowledge are being taught at a young age to help change antiquated social structures and cultural norms.

### **Charcoal Production**

Charcoal production is a very old profession in the country and people involved usually operate within forested areas using traditional techniques such as building of underground pits. The producers apply for a permit to burn wood for charcoal making at the Forestry Section, Ministry of Environment and most of their clients are from the hotel industry. The charcoal is produced using logging waste.

For the past 5 years, there have been very few active charcoal producers, about ten mostly elderly, men and only one female.

The practice has however significantly reduced as nowadays, much of that charcoal is being imported.

### **Timber Harvesting**

Timber plantations are managed by the Seychelles National Parks Authority (SNPA). There are currently 18 Timber merchants that have signed a contract with the authority, however only 15 are active and all are men.

On the other hand, women are actively involved in forest related decision-making, implementation of sustainable forest management, conservation and other multiple-use functions of forests. They are leading key sustainable forest management projects that seeks to decrease forest degradation and deforestation.

### **Coco de mer de mer kernel**

*Lodoicea maldivica*, commonly known as coco de mer, is the world's biggest nut and is endemic to Seychelles

There are presently three local companies in the country that have been given the approval to process and export the coco de mer kernel as a value-added product for this national resource.

Willow Ventures, Island Scent and Bill & Co Pty Ltd all male entrepreneurs' are developing new products, in gastronomy and cosmetics amongst others.

Willow Ventures has developed a new brand of jam made from the coco de mer kernel as well as a brandy made out of coco de mer "La Cocofesse"

#### **4. Conclusions and way forward**

Biodiversity is equally important to all of us. Over the years, Seychelles has reached important milestones in mainstreaming gender issues in many of its policies, programmes and activities at the national and international level. However inequality issues still persist in some sectors.

There has been concentrated effort on programmes that address structural barriers to women's economic empowerment towards biodiversity and sustainable development. Increased female participation in previously male dominated industries such as fisheries and farming, as well as women occupying key leadership positions across Government and Non-Government Organizations offer unique opportunities to make important decisions towards biodiversity conservation and management in the country. Further gender mainstreaming and gender analysis in some sectors is critically important to promote the recruitment of women in these key areas.

Further gender analysis needs to consider constraints and capacities of women and men that are holding back more sustainable practices, thus bringing the roles and needs of women and men high on the development agenda. Additionally, sectors should develop clear guidelines, tools, and methodologies to mainstream gender into biodiversity management and enhance capacity building opportunities for men and women.

The Ministry of Family Affairs should ensure continued commitment and active engagement of their gender focal team/ secretariat with sectors involved directly and indirectly towards biodiversity conservation and management. The Seychelles National Gender Policy (2016) provides guidance on key actions that need to be undertaken by different stakeholders to raise gender issues higher on their organizational agendas. A lot of the information collected will enable the country to move towards a more Gender-responsive NBSAP. Further sensitization

of the public on the positive roles of men and women across society will be instrumental for reducing social ills such as GBV and gender-based discrimination.

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## APPENDIX A

### Gender and the Aichi Biodiversity Targets: Seychelles

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#### ***Strategic Goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society***

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

In general, both women and men are aware of the values of biodiversity. Current level of awareness raising activities in the country is very high. Biodiversity issues are taught in all schools at all levels. There are programmes such as Wildlife clubs, eco schools and others that teach students the value of Biodiversity. They even get hands on experiences such as visiting islands ( some of which are protected areas), participate in mangrove/tree planting, beach cleanups, hikes, forums that get them to voice out their concerns and many more.

Female students studying BSc Environmental Science at the University of Seychelles has always been higher compared to males.

Community Based Organizations steer their own small projects/programmes that benefits most if not all people from their communities. In addition, E-NGOs are actively promoting biodiversity

conservation and have extensive educational programmes/campaigns in schools, communities and international contributions. Most of the time female representation in awareness raising is higher when it comes to planning and coordinating events.

The Biodiversity Conservation and Management Division provides oversight for various projects and programmes across the country, the females lead the educational campaigns and marketing. Women tend to organize more local environmental events. The PR officer is female as well as the Head of the Public Education and Community Outreach (PECO) Section.

All the E-NGOs and MEECC have functioning websites and most are very active on social media platforms such as Facebook and Instagram.

Annually, under the guidance of international conventions and treaties on biodiversity, Seychelles participates in Key theme days such as Wetlands Day and International Day for Biological Diversity. Many organizations take part in or organize different activities to commemorate these days.

Nature Seychelles Conservation boot camp records a higher number of female participants compared to males. During their annual holiday programmes PECO records active participation from both male and female students. For their eco schools programmes girls are active in activities involving poem, essay writing and outdoor activities whilst the boys tend to prefer the outdoor activities.

## Target 2

By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Seychelles has an extensive legislative framework for land and environment management covering most of the land use sectors.

Seychelles seeks to integrate Biodiversity values into development and poverty reduction programs to promote harmonious and sustained development. Biodiversity conservation has been mainstreamed in sectoral planning, policies and programs.

Biodiversity and ecosystem services are taken into account in spatial planning. Through the Seychelles Marine Spatial Plan Initiative, the country has this year legally designated one third (c.f. 30%) of its ocean territory as Marine Protected Areas.

The Environment Protection Act (2016) ensures that actions or measures which may avoid, prevent, change, mitigate or remedy the likely effects of the activity or the project on the environment is implemented through its environment impact assessments. Under the EPA, the Environment Impact Assessment (EIA) Regulation requires that, for certain categories of projects or activities, an EIA must be prepared and an environmental authorization issued. This Regulation aims to ensure that new infrastructure developments do not cause land degradation. The folio for EPA sits at the Environment Assessment and Permit Section (EAPS) whereby the section functions with 5 male and 6 female.

Seychelles Strategic Land Use development Plan (2014-2040) approved at cabinet level sets the National strategic land use planning framework for Seychelles. The Planning Authority has 18 males, 31 female employees.

One of the goals of The National Action Plan (NAP) for Sustainable land Management 2012-2020 is to ensure that land use planning and management is supportive of sustainable land management in Seychelles.

Coastal management actions are implemented by the Coastal Unit, MEECC. The all-female unit currently contains 2 staff. Seychelles Coastal Management Plan 2019–2024 was developed to enhance understanding about the risks associated with climate change and development pressures around the coastal zones in Seychelles.

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Seychelles is dependent on its vibrant ocean rich with natural resources. However, Increased fishing effort due to certain subsidies has had a devastating impact on fish stocks. Fishing activities remain male dominated whilst there are very few women involved or most have little interest in participating anyway.

Government aims to instate measures to eliminate activities harmful to biodiversity. Significant progress with reforming harmful subsidies have been undertaken. The Seychelles Fisheries Authority (SFA) believes that certain demersal species are being threatened by overfishing and are exploring ways and means to remove fuel and ice subsidies from which the artisanal fishing currently benefits (Biofin Seychelles, 2018).

On average SCR 33.3 Million per year were spent on fuel subsidies for the period of 2013 to 2018 for both the artisanal and semi-industrial longline fisheries (Fisheries Comprehensive plan, 2019).

Owners or operators of Seychelles fishing vessels ( Male dominated) engaged in IUU fishing and other fisheries crime may not benefit from Government subsidies or concessions (Fisheries Comprehensive plan, 2019).

Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Seychelles remains a champion when considering its commendable reputation for sustainable environmental management and conservation efforts. Its environment is the foundation of the economy on which tourism, fisheries and other key sectors depend. Throughout the years farmers and fishermen have been male dominated jobs.

The country's marine ecosystem is the foundation of its economy. Through the Seychelles Marine Spatial Plan Initiative, the country has this year legally designated one third (c.f. 30%) of its ocean territory as Marine Protected Areas. The process included public consultation meetings and everybody was invited to share their views on different matters involving the use of our EEZ.

A national Blue Economy Roadmap has been developed and is line with the UN Sustainable Development Goal 14: *Conserve and sustainability use the oceans, seas and marine resources for sustainable development.*

The roadmap highlights the need for effective protection of Seychelles ocean space and resources through better coordination across different sectors.

Gender Mainstreaming is one of the core principle of “The Seychelles National Agricultural Investment Plan 2015-2020 which emphasize the importance of sustainable local production within the context of the broader national development priorities and goals.

The country is also working towards better land use planning for its agricultural lands, forestry, tourism, transport infrastructure, residential areas and other environmental functions. The increasing demand for land, coupled with a limitation of land area is a major cause for more conflicts over land use.

Seychelles INDC 2015 adopts a gender sensitive approach to climate change adaptation and will enable the country to attain the broader aspiration of the country’s sustainable development goals. In addition it highlights the fact that Seychelles needs to build gender-sensitive capacity and social empowerment at all levels to adequately respond to climate change.

In terms of energy production, a number of renewable energy sources (wind and solar power) have started production in recent years. A first draft of a proposed policy on energy efficiency was developed in 2018 to enable Seychelles to attain its renewable energy goals.

***Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use***

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Biodiversity loss affects men, women, elderly people and youth in different ways.

Although the country has adequate legislations in place, capacity to enforce laws relating to habitat protection and conservation is often limited due to inadequate resources. For example the Biodiversity Conservation and Management Division has only 17 staff (10 males and 8 females). Male staff are usually the front line staff, responding to issues such as forest fires and or illegal lighting of fires, dangerous tree emergencies, poaching and illegal activities of timber harvesting. Female staff have some of these responsibilities but tend to focus more on policy development, Impact assessments, restoration and rehabilitation of degraded habitats and education and awareness.

Seychelles has Prioritized management and conservation of threatened species and their habitats. During its annual endemic species census, male consultants are more dominant, for example for the 2019-2020 census, there were 3 males and 1 female consultant monitoring 5 threatened species. For the previous year it was the same.

A number of restoration and or rehabilitation of degraded habitats have been conducted on a number of islands by means of removal of alien predators, reforestation of habitats with native species and reintroduction of native wildlife.

TRASS has planted 7,500 trees on Praslin Island as part of its efforts to prevent erosion and land degradation and to restore mangrove forest. Staff from the Ministry of Environment, Energy and Climate Change and the Seychelles National Parks Authority (SNPA) in collaboration with the British High Commission planted 400 endemic palms in the Morne Seychellois National Park as part of

Queen's Commonwealth Canopy initiative in 2017. To commemorate World Day to Combat Desertification and Drought staff from SNPA including the Ministry of Environment planted 250 Mahogany Tree, at Dan Diri Port Glaud. Students from the Independent School have planted hundreds of small mangrove seedlings since March 2018. Plant Conservation Action Group (PCA) implemented the "Invaz'iles Project" run by IUCN to control the alien prickly woody creeper, *Acacia concinna* on 10 sites in Southern Mahe in 2017-2018.

FAO is supporting Seychelles with its National Forestry Policy. A national forest inventory to provide accurate and updated information on the status of the island's forests, including data on endemic and native species will be undertaken. The Project consultant as well as the National Project coordinator are both male.

Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Fishing has always been a male dominated profession. The fisheries sector plays an important role in contributing to the economic development of the country in terms of provision of jobs, food security, poverty alleviation, gross domestic product (GDP) and foreign exchange. Fisheries in the Seychelles is legislated under the Fisheries Act (2014), which came into force in January 2015.

The Fisheries Comprehensive Plan (2019) aims to maintain resources at a sustainable level and to ensure that adverse effects on non-target species and marine biodiversity are avoided, remedied or mitigated.

The National Plan of Action for the Conservation and Management of Sharks (NPOA) 2016-2020 provides an overview of the shark fishery, status analysis and priority actions for the protection and sustainable management of key shark species. Since 2014, it has been illegal for a commercial fisher to remove the fins from any shark and discard the body.

Seychelles has made significant progress in introducing sustainable fisheries measures, including landing obligations, gear subsidies and incentives, accreditation schemes, and area-based management measures.

SFA is collecting and analyzing fisheries sector data, doing targeted research and studies, undertaking due diligence checks and providing policy advice (Seychelles Fishing Authority Strategic plan 2018-2020).

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Seychelles is currently developing its National Forestry Policy – consultation began in 2019. Forestry is a male dominated sector. The Seychelles National Parks Authority (SNPA) currently manage six marine and three terrestrial national parks spread over the three main islands. From 2018-2020 the Organization was chaired by a woman. All the CEO's so far have been male. Its board of Directors from 2018-2020 was made up of 6 women and 2 men. The organization currently have 13 women and

25 men working in its Forestry Section. One of the role of the section is to undertake routine maintenance, integrated management, development and extension of forest plantation and reserve.

The Aquaculture Section within the SFA was established with the aim of managing, coordinating, undertaking research and development, and ensuring that the regulations for aquaculture are properly adhered to. Currently, 7 men and 6 women work within the section. Raising awareness amongst youths for potential employment opportunities is of critical importance. For that reason an Aquaculture Education and Awareness Programme was developed by the SFA to sensitize the public about the section and the benefits and opportunities that can arise from it. A Mariculture Master Plan was developed in 2017.

The Authority plans to issue 11 licenses this year (SFA, 2020). As the sector grows SFA plans to ensure that research and development interventions are inclusive and meet the needs of everyone.

The Seychelles Agricultural Investment Plan (2015-2020) identifies gender mainstreaming as an important element in its five programmes which includes sustainable agriculture, fisheries and aquaculture as well as food security and human capacity development.

Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Women and men alike play a critical role in managing natural resources as everyone is affected by environmental degradation.

In response to the issues of marine plastic pollution affecting Seychelles, two young women, co-founded The Ocean Project Seychelles (TOP) in 2016. Since its establishment the Ocean Project have hosted around 41 coastal clean ups and have engaged more than one thousand volunteers.

A Seychelles Free from Plastic Bags was a campaign launched by the SIDS Youth AIMS Hub in 2015. Most of SYAH members are female, 62 compared to 13 male volunteers.

SIF spearheaded the first ever ‘Aldabra Clean-Up Project’ whereby six Seychellois Volunteers participated, selected through a national video competition. Twenty-five tonnes of waste were collected over five weeks.

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Invasive species are one of the greatest risks to Seychelles biodiversity. Control/eradication of invasive species has been conducted on many Seychelles Islands and for many species such as rats, cats, rabbits etc.

The National Biosecurity Agency had 32 females and 27 males employed (NBA 2019). The Agency is responsible for biosecurity protection in Seychelles with the mandate to prevent the introduction and spread of animal and plant pest and disease including Invasive Alien Species.

Four Seychellois are now better equipped to deal with fish health management after attending a one-week training course on fish health and biosecurity at the Rhodes University in South Africa in 2018 (Seychelles News Agency, 2018). 2 women and 2 men represented the country.

Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Women and men are engaged in all aspects of interaction with our ocean. A lot of programs and projects implemented by different organizations have targeted a broad range of stakeholders at all levels to empower each and every citizen to take care of the ocean and enable them to contribute towards transformative actions. A common message is that we have equal roles to play in safeguarding our ocean.

The identification of ecosystems that are vulnerable to climate change in the country has already been done.

Numerous organizations are leading coral reef restoration projects. The **Marine Conservation Society Seychelles** maintains a coral nursey on Cerf Island by 2 males and two female staff. Nature Seychelles organized the first-ever Reef Rescuers Training program delivered in 2015.

**Terrestrial Restoration Action Society of Seychelles** (TRASS) is leading forest restoration efforts by planting 15, 000 trees annually on Praslin Island whereby most of its mountain peaks have been destroyed by continuous forest fires. TRASS has more female volunteers compared to males.

A greater understanding of the multiple pressures impacting vulnerable ecosystems and native species (including climate change) has been attained, but much more research is required.

Seychelles is leading the Commonwealth Blue Charter Action Group on Marine Protected Areas (MPAs). The country has made significant progress in ensuring its species and habitats of national and international importance are safeguarded in a network of marine and terrestrial protected areas. MEECC is the lead organization working on the action group and the team is mostly female.

Almost if not all organizations addressing pressures on vulnerable ecosystems such as coral reefs, mangroves etc. have equal participation of men and women. Men generally prefer working on islands away from the mainland.

#### Target 11

By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Seychelles has a long history of conservation and management measures in place. The guiding principles of the Seychelles Marine Spatial Plan includes transparency, inclusivity and participation of all stakeholders and decisions made in the interest of the whole community and not any one group.

The MSP Policy seeks “To support a healthy productive marine environment, local communities and the development of the Blue Economy through improved and integrated management for conservation, sustainable use and ecosystem resilience. 13 men and 13 women were involved in the Stakeholder Consultation Workshop to Review the Draft MSP Policy back in 2017. In another workshop to Define Governance Arrangements for the Seychelles Marine Spatial Plan 18 men, 13 women attended.

In March 2020, Seychelles achieved its goal to designate 30% or 410,000 sq.km (158,000 sq.miles) of its ocean as Marine Protected Areas. This long process was led by a female project Manager.

Despite different roles, E-NGOS are creating an environment where women and men conservation professionals stand on equal ground and thrive. We all depend upon the natural resources for survival, therefore biodiversity conservation involved every stakeholder.

Protected area management is done by both men and women. The Seychelles National Parks Authority (SNPA) has 4 women and 7 men working in the National Parks. There are 7 males and 3 females working on Aldabra. 12 males and 10 females work on Aride.

#### Target 12

By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Seychelles is highly committed to Biodiversity conservation especially of threatened species and their habitats. Addressing gender issues essential in achieving sustainability objectives.

Most of the more experienced scientists in the country are male. Over the years, countless pioneering female conservationists/scientists have worked tirelessly to save endangered wildlife and plants. For a lot of species, their population status has greatly improved as a result of species conservation projects.

Nowadays both males and females are almost equally active when it comes to biodiversity conservation. From the implementation of key conservation projects to working to policy making, contributions have been observed from both genders.

Women are proving themselves as experienced leaders and strong field workers against many challenges female conservationists/scientists have to face. A lot of E-NGOs are encouraging women to apply for Jobs within their organizations e.g. SIF, Nature Seychelles.

There are in place committees set up to provide oversight and advice on the conservation of threatened species for example: The Seychelles Magpie Robin Steering Committee chaired by Nature Seychelles has 7 members, 3 men and 5 women. The Turtle Action Group Seychelles consists of 5 females and 4 males (Board of Trustees). The chairperson is a woman. TAGS acts as a forum for communication and information sharing amongst individuals and organizations working on sea turtle biology and conservation.

Men are particularly strong candidates when applying for certain consultancies that involve work with threatened species and or their habitats. For example for 2019- 2020, more men applied for the MEECCs annual endangered species census (3 men and 1 woman). For the past three annual censuses, it has always been only 1 woman and for the same species.

### **Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services**

#### Target 14

By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Ecosystem Based Adaptation to climate change in Seychelles project has a Gender Action Plan 2019-2021. Some of the activities included is to conduct certified trainings targeting women in communities



for example women on the watershed committee and encourage women to apply for project consultancies.

There were 122 consultancies done for the EBA project by January 2019, 112 male and 10 females were recorded (PCU, 2019).

2 out of the 4 watershed committees have female chair persons. For example the Baie Lazare committee contains 7 men and 6 women, the Caiman Committee 8 men 6 women. The Mont Plaisir Committee contains 10 females and 3 males (EBA Project, 2018).

The Seychelles Wetland Policy and Action Plan 2019-2022 empowers all stakeholders to contribute to the conservation and sustainable use of wetlands.

#### Target 16

By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Seychelles became the fourth country to ratify the Nagoya Protocol in 2012. Women participation in ABS issues have been key. The country launched its ABS policy in 2019. The Focal point for ABS is male whilst the National Project Coordinator for ABS project female. Most consultants who worked on ABS guidelines, scoping either National or international were women. For example The National Consultancy for communications and awareness raising - ABS Project- woman. The consultant who developed the ABS guidelines was female.

Within MEECC, Women lead the approval process for providing access to genetic resources in Seychelles as well as negotiating Mutually Agreed Terms (MATs).

In 2019 a Training workshop for mainstreaming gender into programming and reporting on gender results was organized. Materials shared with stakeholders present included a Gender Toolkit and Reporting gender equality results in ABS.

### ***Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building***

#### **Target 17**

By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Seychelles is one of the 67 countries with no mention of gender and or women keyword in its NBSAP. The country does however recognize biodiversity as a crosscutting socio-economic issue and therefore has a broad and complex stakeholder community.

The NBSAP steering committee membership comprised of 7 women and 12 men and contributors to the overall process involved 47 men and 33 women.

Seychelles has made remarkable improvement in terms of gender reporting, considerations etc. since the development of the 2<sup>nd</sup> NBSAP. The Gender and Biodiversity Report has been compiled for the first time and will enable gender issues to be included in future CBD and other reporting.

#### **Target 19**

By 2020, knowledge, the science base and technologies relating to biodiversity, its values,

functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Knowledge generation on biodiversity plays an important role in updating existing data as well as in improving science-policy interface. Academic institutions, research organizations, E-NGOs, private research institutions, and individuals have been contributing to strengthen science and technology based knowledge relating to biodiversity.

Seychelles has a strong community of local scientists however due to existing knowledge gaps and limited technological/human capacities, the country relies of foreign experts to train, conduct research etc.

One of the core function of the Seychelles Bureau of Standards is to collect and collate information on research and development of relevance to Seychelles and evaluate and disseminate research findings. The organization issues research permit for research application submitted by foreign applicants. This process is implemented in collaboration and consultation with MEECC and other Government Departments, Agencies, and NGO's. Most of the researches that have been carried out are related to biodiversity conservation. The Deputy CEO at SBS is female.

The National institute for science, technology & innovation (NIISTI) will take over the research mandate over the coming months.

#### **Target 20**

By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

The newly created Biodiversity Finance Unit (BFU) currently sits within the Biodiversity Conservation and Management Division, MEECC headed by a woman. The Senior Biofin project coordinator is female and she will be responsible for the implementation of the Finance Plan for Biodiversity Conservation (2019-2023). The Seychelles Biofin Plan reviews all related initiatives in Seychelles such as MSP and SeyCCAT both led by women.

The plan provides different biodiversity finance solutions in several sectors including Biosecurity services, sustainable fisheries and blue economy, Tourism etc.

Budget allocation for biodiversity conservation remains limited (2%) compare to the national budget allocations. There is a need to further mainstream the NBSAP into the NDS and national budget planning process (BioFIN, 2019- 2023).The country is looking into more ways of increasing financial flows for biodiversity.

The NBSAP put forth a number of strategies in order to ensure the adequate and dedicated fund generation for biodiversity. Sustainable financing is identified as a key for the implementation of the NBSAP. The NBSAP identified 31 priority projects and several projects have or are contributing towards sustainable financing for biodiversity.

SeyCCAT mobilizes funding for conservation and climate change adaptation using grant funding mechanism. The main source of funding is Debt Swap, US \$ 150, 000 per annum), (BioFIN, 2019-2023). The organization received 35 applications for a large grant was and 13 projects have secured funding under the Blue Grants Fund. Women are leading many of the successful projects that looks at

issues such as corals, education about the marine environment, sustainable tourism and wetland rehabilitation.

The Central Bank of Seychelles advise the Government on banking, monetary and financial matters, including the monetary implications of proposed fiscal, credit policies or operations of the Government and promotes a sound financial system. Its board members include 5 men and 3 women. The Board is headed by the bank Governor, a woman.

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