DRAFT Management Plan for the Cosmoledo and Astove Archipelago Sustainable Use (Zone 2) Area

Third South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish3)

JUNE 2023 *(Cover Image: David Welch)*

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Executive Summary

Seychelles is a small island nation of about 115 tropical islands (both granitic and coralline) with a population of approximately 98,000 people (United Nations 2022[1]), mostly living on the Inner Islands. Located in the western Indian Ocean northeast of Madagascar, the country is widely known as a large ocean state with an Exclusive Economic Zone (EEZ) of 1.4 million km² and small land area of 459 km².

Environmental protection is a continuing flagship for Seychelles as the island nation's ocean resources are considered vital for the development of its fisheries and tourism industries, as well as for facilitating trade. To bolster environmental sustainability, the Seychelles government has embraced a blue economy agenda as an organising principle to drive growth further, while preserving and building the country's natural assets. A national Blue Economy Roadmap has been developed and is line with the UN Sustainable Development Goal (SDG) 14: *Conserve and sustainably use the oceans, seas and marine resources for sustainable development*.

The Government of Seychelles (GoS) is developing a Seychelles Marine Spatial Plan (SMSP) and in 2020 designated thirteen areas based on protection of biodiversity values and sustainable uses (Zone 1 and Zone 2), reaching the milestone of 30% marine protection gazetted (March 2020).

The **Cosmoledo and Astove Archipelago Sustainable Use Area** (Zone 2)[2] is over 950 km from the inner islands in the southwest of the Seychelles EEZ and covers 5,321 km², representing 0.39% of the total EEZ area. The Area is approximately 130 km east of Aldabra Atoll and 400 km west of Farquhar Atoll. The 2019 SMSP nomination file states that the Area contains 40 biodiversity features, 15 of 44 habitat conservation features and 25 of 38 species conservation features including 5 birds, 13 cetaceans, 6 deep water, 4 shallow water, 1 BirdLife Important Bird Area, turtle nesting and foraging habitats, and 1 WIOMER site. The Area has a 100% overlap with all cetaceans except Orca at 95%. WIOMER covers 100%. Canyons cover 7%, continental slopes cover 92% and abyssal features cover 22% in the Seychelles.

The management goal for this Sustainable Use Area is ***To ensure the protection and enhancement of the outstanding and unique ecology and biodiversity values while maintaining and creating opportunities for responsible and sustainably managed activities***. There are four management objectives to meet this goal under four thematic categories:

1. To maintain and enhance the unique biodiversity, ecological values and integrity (ecological and biodiversity).
2. To ensure management processes are transparent, equitable and participatory, and deliver effective monitoring, compliance and enforcement (governance).
3. To facilitate equitable access and opportunities for Seychellois to maintain and enhance social benefits and cultural values (social and cultural).
4. To optimise and diversify sustainable economic activities and facilitate equitable access to economic opportunities (economic).

[1] https://population.un.org/wpp/

[2] Officially, still classified as 'Area of Outstanding Natural Beauty (AONB) under the National parks and Nature Conservancy Act (NPNCA). To be reclassified as 'Sustainable Use Area' once new legislation is enacted.

This document provides a sustainable use management plan for the Cosmoledo and Astove Archipelago Sustainable Use Area under the Seychelles MSP, and it has been developed through stakeholder consultation (from September 2022 to July 2023). The Plan comprises 10 sections:

- Section 1 is the ***Introduction*** and contains the purpose and scope of the plan (including management goal and objectives), a description of how the planning process was undertaken, and instructions on how to use this plan for managers, stakeholders and other users.
- Section 2 provides the ***Management Context***. It describes the management body, overall governance and designation for sustainable use area protection in the Seychelles, the legal and policy framework, tenure and other management instruments in the Area.
- Section 3 describes the ***Management Area Pressures and Issues***, identified by stakeholders and in the literature, the scope of the plan to address these issues, and presents a set of key principles (biophysical, socioeconomic and cultural) to guide the development of the Cosmoledo and Astove Archipelago management plan.
- Section 4 covers the ***Management Strategies*** defined for the Area, including a description of the sustainable use allowable activities, the strategies and actions to address the identified priority issues while delivering improved sustainable use of the Area, and a description of the enabling policy and regulations in place.
- Section 5 defines the ***Cosmoledo and Astove Archipelago Sustainable Use Area***, including the history of the site, surrounding features and its values (ecological, social, cultural, economic and others).
- Section 6 summarises the ***Current Uses*** in the Area, including fisheries, maritime infrastructure, tourism and recreation, non-renewable and resource extraction activities, and other activities related to research and education in the Area.
- Section 7 provides an overview of ***Implementation and Governance*** under this sustainable use management plan.
- Section 8 identifies the ***Performance Measurement Framework***, including a list of indicators to be monitored and reported on to track the implementation and effectiveness of this sustainable use management plan.
- Section 9 covers ***Compliance and Enforcement***, including the ***monitoring and surveillance*** needed to ensure successful implementation of the strategies in the Plan.
- Finally, Section 10 contains an overview of the ***Plan review process***.

These sections are supplemented by Annexes that provide further detail around implementation and governance, financing, regulations and enforcement, and the stakeholders involved in the Plan development process. It is intended that this sustainable use management plan is a 5-year document (2024–2028), that will be reviewed mid-way (2026) and updated every 5 years throughout implementation.

Acknowledgements

We would like to acknowledge the Government of Seychelles (GoS) for recognising the need for a national marine spatial plan (MSP) and their world-leading initiative in this field. The Ministry of Agriculture, Climate Change and Environment (MACCE) provided welcome guidance and support throughout the sustainable use management planning process, particularly PS Denis Matatiken, Ashley Dias and Sophie Morel from the Department of Environment, and Justin Prosper from the Climate Change Department. We also thank the Seychelles Fishing Authority for their support and engagement in the process, in particular Vincent Lucas and Rodney Govinden. The funding for this sustainable use management planning process was made available through the Third South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish3) and the Project Coordination Unit, particularly Jan Robinson, provided valuable guidance and support throughout. Helena Sims, Joanna Smith, and Elke Talma from the Seychelles MSP team and SeyCCAT also provided valuable feedback and guidance on consultations with stakeholders. We also wish to thank the individuals and stakeholder groups of the Cosmoledo and Astove Archipelago area who contributed their valuable time to develop this sustainable use management plan under the Seychelles MSP.

1. Introduction

1.1 Management Plan purpose

This document represents the first management plan developed to guide the environmental management of the Cosmoledo and Astove Archipelago Sustainable Use Area (the Area) designated under the Seychelles Marine Spatial Plan initiative. The Cosmoledo and Astove Archipelago management plan has a focus on protecting marine habitats and species, while allowing opportunities for economic activities and sustainable long-term use of resources to ensure that current and future activities do not cause environmental harm.

The Government of Seychelles (GoS) is developing a Seychelles Marine Spatial Plan (SMSP) and in 2020 designated thirteen areas based on protection of biodiversity values and sustainable uses (Zone 1 and Zone 2), reaching the milestone of 30% marine protection gazetted (March 2020). The Cosmoledo and Astove Archipelago Sustainable Use Area is one of eight Zone 2 (sustainable use) areas[3]. The Department of Environment within the Ministry of Agriculture, Climate Change and Environment (MACCE) will oversee implemention of the Cosmoledo and Astove Archipelago Sustainable Use Area Management Plan (the Management Plan) undertaken by delegated authorities. This Management Plan provides a resource for managers and stakeholders to know what activities are allowed, how compliance and enforcement will be conducted, and understand their responsibilities as users of the Area and within the broader SMSP.

The preparation and implementation of this Management Plan forms part of the SMSP initiative. Article 38 of the Seychelles Constitution and the guiding principles of the Seychelles Sustainable Development Strategy provide an overall goal for the MSP Initiative: *develop and implement an integrated marine plan to optimise the sustainable use and effective management of the Seychelles marine environment while ensuring and improving the social, cultural and economic wellbeing of its people*. Under the SMSP initiative, an MSP Policy has been drafted and was endorsed by Cabinet in Sept 2020. The MSP Policy has multiple objectives, in particular to: *address comprehensive marine environmental management of Seychelles EEZ and Territorial Sea, take on-board the Seychelles' international commitments while taking into consideration modern developments in Protected Area management, blue economy and sustainable development, meet and surpass the Convention on Biological Diversity (CBD) Aichi target of 10% marine protection by 2020, facilitate integrated governance between Ministries, and meet and surpass the United Nations Sustainable Development Goals (SDG) of 10% marine protect by 2020*.

The SMSP initiative and this Management Plan form part of the Seychelles international commitment to:

- ***Convention on Biological Diversity Aichi Target 11***: 10% of coastal and marine areas are effectively conserved by 2020.
- ***Sustainable Development Goal Target 14.5***: By 2020, conserve at least 10% of coastal and marine areas, consistent with national and international law and based on the best available scientific information.

[3] Officially, still classified as 'Area of Outstanding Natural Beauty (AONB) under the National parks and Nature Conservancy Act (NPNCA). To be reclassified as 'Sustainable Use Area' once new legislation is enacted.

1.2 Management Plan scope

This Management Plan serves as a blueprint for the administration and operation of the Cosmoledo and Astove Archipelago Sustainable Use Area, with a focus on biodiversity conservation, sustainable use, equitable access, transparent decision-making, and addressing current and future challenges.

The Cosmoledo and Astove Archipelago Sustainable Use Area is over 950 km from the inner islands in the southwest of the Seychelles EEZ and covers 5,321 km^2, representing 0.39% of the total EEZ area. The Area is approximately 130 km east of Aldabra Atoll and 400 km west of Farquhar Atoll. This Management Plan covers the marine waters around and between Cosmoledo and Astove Atolls up to mean high-water mark (Figure 1).

The Cosmoledo and Astove Archipelago are enclosed by a boundary (Figure 1) that excludes industrial fishing by foreign fishing vessels. This area is gazetted under the Seychelles Fisheries Act, Zone 8: Comprising an area around Cosmoledo and Astove Islands. Under these arrangements, foreign fishing vessels cannot conduct industrial longline or purse seine fishing in the Area, and drifting FADs are not allowed.

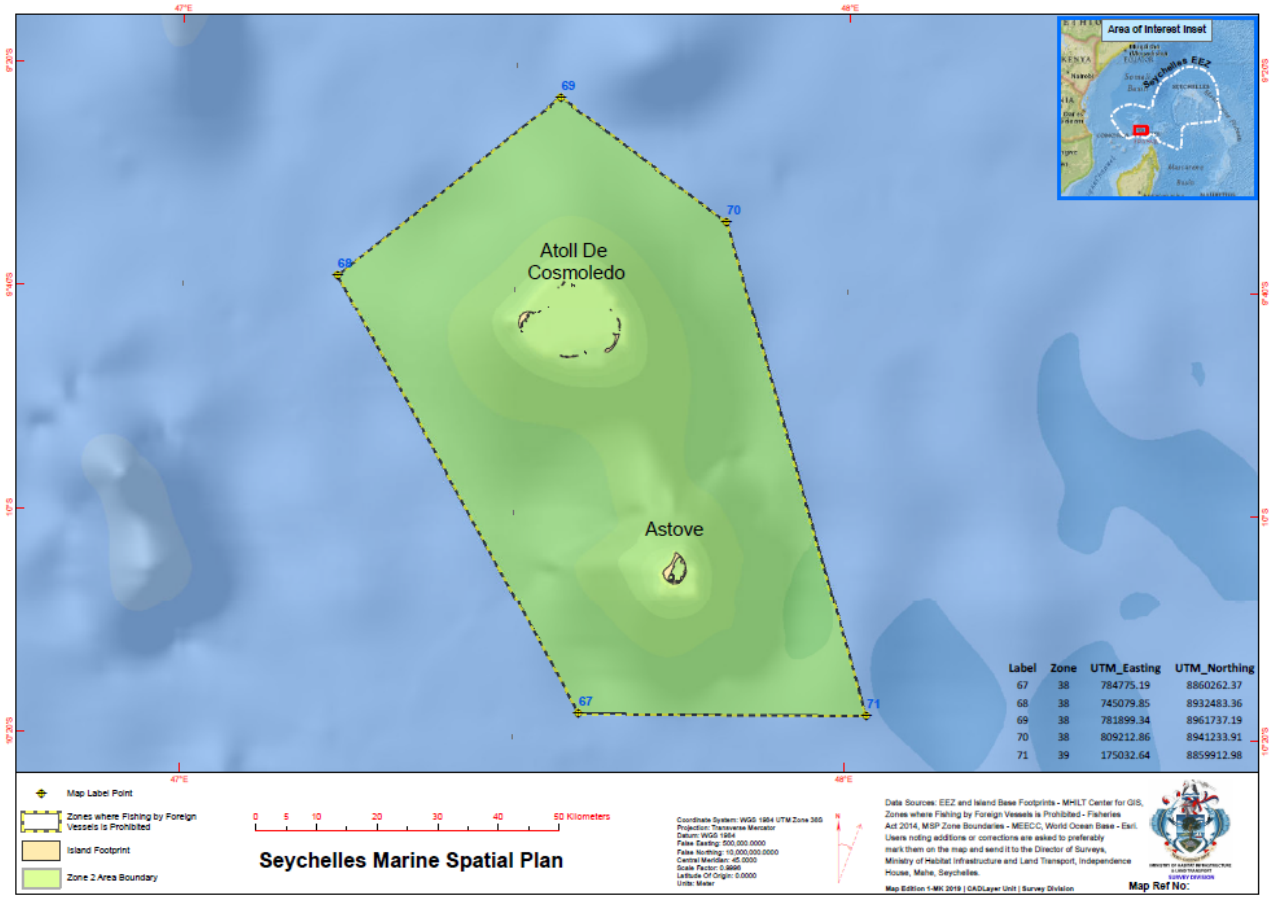


Figure 1. Map showing the location and boundaries of the Cosmoledo and Astove Archipelago Sustainable Use Area that is the subject of this Management Plan, with insert showing the location within the Seychelles EEZ.

1.2.1 Management Goal

'To ensure the protection and enhancement of the outstanding and unique ecology and biodiversity values while maintaining and creating opportunities for responsible and sustainably managed activities.'

1.2.2 Management Objectives

Four objectives have been identified with stakeholders to achieve the goal of the Cosmoledo and Astove Sustainable Use Area Management Plan. These objectives fall into four themes as described below:

Ecological and Biodiversity: To maintain and enhance the unique biodiversity, ecological values and integrity.

Governance: To ensure management processes are transparent, equitable and participatory, and deliver effective monitoring, compliance and enforcement.

Social & Cultural: To facilitate equitable access and opportunities for Seychellois to maintain and enhance social benefits and cultural values.

Economic: To optimise and diversify sustainable economic activities, and facilitate equitable access to economic opportunities.

1.3 Planning process

The development of this Management Plan built on the extensive consultative processes and networks developed during the SMSP processes since 2014 (Table 1). A consultative process involving multiple and diverse stakeholders was conducted from September 2022 and June 2023[4]. The consultation process was conducted in conjunction with processes to develop management plans for the Farquhar Archipelago and Amirantes to Fortune Banks Sustainable Use areas.

The process for developing this Management Plan was consistent with the principles of participatory management planning and international best-practice in this field (IUCN 2003, Green et al. 2020) and followed a systematic and structured four-step approach (Figure 2). It included a **scoping step** where information was collected through a desk-top review and consultation with stakeholders via email and direct discussion in Seychelles during September 2022. Participatory discussions about goal and objectives, main issues and management strategies for the Area during workshops and virtual meetings from November 2022 to January 2023 (**plan development step**). Collectively, this information was used to draft the management plan, which was circulated for further input in April 2023 (plan review step), before a second public consultation phase during June-July 2023 and finalising the Management Plan (**finalise plan step**).

[4] Project led by C_2O Fisheries under the guidance of the Seychelles Department of Environment and funded by SWIOFish3.

Figure 2. Overview of the process for the development of the Cosmoledo and Astove Archipelago Sustainable Use Area Management Plan consistent with the principles of participatory planning and international best-practice.

This Management Plan was developed through a consultative process involving diverse stakeholders, and is an extension of the consultative processes conducted under the overarching SMSP process. The chronology for development of the Management Plan within the national SMSP process is detailed in Table 1.

Table 1. Chronology of key Seychelles MSP foundational activities (shaded in green) and consultation and process steps in the development of the Cosmoledo and Astove Archipelago Sustainable Use Area Management Plan.

Year	Key Event
2012	Seychelles commits to protect 30% of the EEZ and 50% of terrestrial area
January 2014	Seychelles signs Abu Dhabi Blue Economy Declaration
February 2014	Seychelles initiates the Seychelles MSP initiative
November 2015	Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) Act enacted
February 2016	Debt Swap agreement finalised
September 2017	MSP Policy drafted
February 2018	MSP Milestone 1 completed – 15% marine protected gazetted
July 2018	Cabinet approval to develop governance framework to implement MSP Ocean Authority
November 2018	Cabinet approval for preparation nomination file MSP Phase 2, Milestone 2 areas
April 2019	MSP Milestone 2 completed – 26% marine protection gazetted
November 2019	Cabinet approval for preparation nomination file MSP Phase 2, Milestone 3 areas
March 2020	MSP milestone – 30% marine protected gazetted
April 2020 – 2022	Planning process slowed during COVID-19 Global Pandemic
September 2022	Process commences for developing Cosmoledo and Astove Archipelago and other Sustainable Use (Zone 2) Area Management Plans – Scoping Step
Nov 2022 – March 2023	Broad stakeholder engagement – Plan Development Step
Mar-Apr 2023	Public review of draft management plans – Plan Review Step
May-July 2023	Public review period for final management plans – Finalise Plan Step

A total of 38 meetings, 10 participatory workshops, 3 public information sessions, and over 26 stakeholder groups or representatives were consulted and provided input to the development of this Management Plan over a 10-month period from September 2022 to June 2023. A full list of all stakeholders involved in the process is provided as part of the Stakeholder Analysis Annex.

1.4 How to use this Management Plan

This Management Plan is a guide for managers, stakeholders and users of the Cosmoledo and Astove Archipelago Sustainable Use Area on the issues (Section 3), allowable activities, and management strategies and actions (Section 4). It includes a summary of the Area values (Section 5) and current uses (Section 6), as well as implementation and governance (Section 7). Managers can refer to Section 4 for management strategies needed to implement the Management Plan as well as specific management actions that need to be translated into regulations under the relevant legislation. Managers and stakeholders should also refer to the Area performance management framework (Section 8), compliance and enforcement (Section 9), and management plan review (Section 10).

Note that this Management Plan is to be implemented in conjunction with other legislative instruments, including international conventions. This Management Plan neither negates or replaces these other legal management arrangements, but should be implemented alongside and in coordination with these legal instruments (Sections 2.3 and 2.6).

2. Management Context

As a signatory to various international conventions, the Seychelles is committed to protecting 30% of their marine EEZ, under the guidance of the Seychelles Marine Spatial Plan (SMSP) Initiative (see Section 1.3). The SMSP Zoning Framework contains three zone categories: Zone 1: high protection of marine biodiversity; Zone 2: medium protection of biodiversity and sustainable uses; and Zone 3 multiple uses. The Cosmoledo and Astove Archipelago, identified as a sustainable use (Zone 2) area, aligns with the objective for medium biodiversity protection and sustainable uses. Allowable activities in the Area are intended to be compatible with this objective and include some extraction, commercial harvest, seabed disturbance, and economic development.

This Management Plan provides the guidance for managing the Cosmoledo and Astove Archipelago Sustainable Use Area in line with the MSP allowable activities and is intended to reflect and align with the intent and strategies of existing management instruments in place.

2.1 Management body

Implementation of management plans developed through the SMSP process requires an empowered coordinating agency to enable effective monitoring and evaluation, adaptive management, and the realisation of the SMSP strategic objectives. After extensive consultation including government agencies and stakeholders, the *Seychelles Oceans Authority Bill* was drafted in preparation for the transition of the SMSP to implementation. Once established, the Seychelles Oceans Authority (SOA) will have the mandate for overall marine spatial planning and to provide coordination and oversight of implementing agencies to progress the goals and objectives of the various management plans including this Management Plan. More information on these governance arrangements is detailed in Section 7.

While governance arrangements are yet to be finalized and the SOA has yet to be established, the Seychelles Oceans Agency has been nominated as an interim governing body that if approved,

will work with implementing agencies to provide planning and coordination for implementing the Cosmoledo and Astove Archipelago Sustainable Use Area Management Plan. The delegated authorities responsible for overseeing the implementation of this Management Plan are yet to be officially designated by the Government. It is expected that a multi-stakeholder co-management approach will be adopted, and a management committee will be established with representation from at least the following government entities:

- Ministry of Agriculture, Climate Change and Environment (MACCE)
- Ministry of Fisheries and the Blue Economy (MOFBE)
- Ministry of Transport (MOT)
- Islands Development Company (IDC)
- Seychelles Fishing Authority (SFA)
- Seychelles Maritime Safety Authority (SMSA)
- Seychelles Defense Forces (SDF)
- National Information Sharing and Coordination Centre (NISCC)

The delegated authorities will report to MACCE and will work cooperatively to implement the strategies in this Management Plan, and conduct compliance and enforcement activities to ensure the goal and objectives for the Cosmoledo and Astove Archipelago Area are achieved.

2.2 Protected Area governance

In the 1960–1990s, Seychelles was one of the first countries in the Western Indian Ocean to establish a network of marine protected areas (MPA), at the time covering less than 1% of the EEZ. The selection criteria for these early MPA were based primarily on aesthetic objectives for tourism values and were designated with limited stakeholder consultation. The Government of Seychelles has various international and national commitments to conservation and management that guide the ongoing processes and governance for these MPA (details in Appendix A).

The SMSP is being developed as a regulatory plan, where zones will be legally designated and enforced. The SMSP Zoning Framework is an objective-based framework that contains three zone categories: Zone 1: high protection of marine biodiversity; Zone 2: medium protection of biodiversity and sustainable uses; and Zone 3 multiple uses (pending approval). The zoning categories correspond to the MSP objectives for 30% marine protection goal (Zones 1 and 2), sustainable economic development (Zones 2 and 3), climate change adaptation (all zones), and advancing the Blue Economy roadmap (all zones).

While management arrangements are yet to be finalized, it is proposed that implementation of this Management Plan will be coordinated and overseen by the Seychelles Ocean Agency with implementation delivered through line agencies. Under this arrangement, management of specific activities will be delivered through the relevant implementing line agencies. For example, management arrangements related to fishing activities will be delivered through the SFA; compliance and enforcement through coordinated efforts of the Seychelles Coastguard, SFA, SDF and NISCC; and management of vessel related issues delivered through the SMSA. Meanwhile, the governance arrangements for this Management Plan will also include a multi-sectoral management committee, a multi-sectoral scientific committee, and an independent Complaints and Resolution body to address complaints (see Section 4).

All legal activities within Zones 1 and 2 are allowable under existing management regimes until this Management Plan is endorsed by Cabinet, relevant legislation is enacted, and management

systems have been established and are legally enforceable (e.g. national permit system). This Management Plan also includes actions to develop further management arrangements, for example, establishing a coordinated permits system (see Section 4). Until those arrangements commence, existing management arrangements will continue to apply. Furthermore, this Management Plan does not replace or extinguish other legally binding management arrangements currently in force, for example the provisions of the Seychelles Fisheries Act and Regulations (see Section 2.6).

2.3 Legal and policy framework

The Government of Seychelles has enacted laws that call for the protection of biodiversity and land and seascapes through several legal and policy instruments.

The policy framework for the designation of Protected Areas in the Seychelles is outlined in the Seychelles' Protected Area Policy (2013). The Policy defines five categories of protected areas. Each of the category aligns with a particular IUCN Protected Area category. They are:

- Strict Nature Reserve (IUCN Ia)
- Ecological Reserve (IUCN IV)
- National Park (IUCN II)
- Protected landscape/seascape (IUCN V)
- Sustainable Use Area (IUCN VI)

The Seychelles' Protected Area Policy also provide details of the procedures for designation and declassification of Protected Areas.

The legal and policy framework is derived from Article 38 of the Constitution, which establishes the principle of environmental rights and declares that: "*the State recognizes the right of every person to live in and enjoy a clean, healthy and ecologically balanced environment and with a view to ensuring the effective realization of this right the State undertakes ….to ensure a sustainable socio-economic development of Seychelles by a judicious use and management of the resources of the Seychelles*". The specific legal framework for the designation of different types of Protected Areas is provided by the *National Parks and Nature Conservancy Act* (1969).

The Government of Seychelles has also ratified and/or is a voluntary signatory on several international treaties and agreements (see Appendix A). Activities in the Cosmoledo and Astove Area must be done in accordance with the terms of these agreements, including the Convention on International Trade on Endangered Species (CITES); Port State Measures Agreement (PSMA); UN Convention on Biological Diversity (UN CBD); Convention on the Conservation of Migratory Species of Wild Animals (CMS); UN Convention for the Law of the Sea (UNCLOS); UN Sustainable Development Goals (UN SDG).

The Management Plan for this Area will be a regulatory plan that is legally designated and enforced. Specific legislation for designating and implementing this Management Plan has been finalised but the regulations are currently being developed. In the interim the *Seychelles National Parks and Nature Conservation Act* (NPNC Act 1991) is used for designating the SMSP zones. The Zone 1 areas are in the category of '(Marine) National Park'. Sustainable Use 'Zone 2' areas, including the Cosmoledo and Astove Archipelago, are gazetted using the '(Marine) Area of Outstanding Natural Beauty' (AONB) category in the NPNC Act. Both Zone 1 and Zone 2 areas will be re-designated when the new legislation is approved, as (Marine) National Park and (Marine) Sustainable Use Area, respectively.

2.4 Protected Area designation

All areas in the 2019 SMSP nomination file were proposed during extensive consultations with stakeholders between 2017–2019, with scientific analyses of best available data, and reaching agreement for support with all marine sectors. The 30% marine protection is half "no take" areas to protect marine biodiversity resources and half sustainable use and biodiversity conservation.

The Cosmoldeo and Astove Archipelago Sustainable Use Area Management Plan has been developed under the framework of the Seychelles Marine Spatial Plan (SMSP) initiative that includes Zone 1: high protection of marine biodiversity; Zone 2: medium protection of biodiversity and sustainable uses; and Zone 3 multiple uses.

As a Sustainable Use 'Zone 2" Area, management of the Cosmoledo and Astove Archipelago aligns with a protected area category with overarching objectives for medium biodiversity protection and sustainable uses. These zones include habitats and species that have some tolerance to disturbance and human activities. These zones also include regionally and nationally significant areas. Allowable activities are intended to be compatible with this objective and include some extraction, commercial harvest, seabed disturbance and economic development. The draft list of allowable activities is included in Section 4, and definitions of these activities are included in Appendix B.

The Cosmoledo and Astove Sustainable Use Area is currently gazetted and managed under the NPNC Act (see Section 2.3). Once the required regulations are finalised, the new legislation for the designating and implementing this Management Plan will come into force.

2.5 Tenure

The Cosmoledo and Astove Archipelago Sustainable Use Area is owned by the Government of Seychelles. The waters within the Seychelles Exclusive Economic Zone (EEZ) are managed through several different Acts and delegated authorities. The islands in the Cosmoledo and Astove Archipelago Sustainable Use Area are managed by the Islands Development Company (IDC) for conservation and tourism on a long-term lease with the Seychelles Government. Island conservation management plans have been developed by the IDC and Island Conservation Society (ICS) for Cosmoledo and Astove atolls but expired in 2021 (Cosmoledo) and 2022 (Astove). Meanwhile, the waters of the Area below the mean high-water mark are the marine realm of the Seychelles where nationally applicable regulations, access rights, and responsibilities apply (e.g. the Seychelles Fisheries Act 2014).

2.6 Other management instruments

The Cosmoledo and Astove Archipelago Sustainable Use Area overlaps and is surrounded by existing maritime zones and boundaries managed by a range of agencies for different management purposes. This Section provides information about integration and alignment with these other maritime boundaries and the relevant policies, regulations and management plans. It is intended to reflect and align with the intent and strategies in these other management instruments. These other management instruments include:

- The *Fisheries Act (2014)*, which provides the legal framework for the management and sustainable development of fisheries in accordance with international norms, standards and best practice and an ecosystem approach to fisheries. The *Fisheries Act* regulates the use of fishing gears and activities. The use of spearguns, explosives, poisons, and noxious substances is prohibited across all fisheries in Seychelles, including the recreational fishery. The *Fisheries*

Act also bans the use of unauthorized fish aggregating devices, and attracting sharks. As [large] net fishing is a licensable activity, the use of large nets is not allowed as part of recreational fishing. The use of demersal trawl nets is also prohibited under the Fisheries Regulations (1987).

- The Cosmoledo and Astove Archipelago Sustainable Use Area overlaps with a Foreign Fishing exclusion zone where fishing by industrial vessels is prohibited as per the *Fisheries Regulations* (1987). These boundaries of the exclusion zones are detailed in Schedule 1 of the Fisheries Regulation (1987). There is a proposal from the Seychelles Fishing Authority that all industrial fishing vessels (including local vessels) will be excluded from Foreign Fishing Vessels Prohibited Areas under a future amendment (proposed amendment of Fisheries Act).
- The *Environment Protection Act* (2016) has provisions that regulate pollution including marine litter, sewage and wastewater discharge, coastal zone management, and environmental impacts assessment.
- The Petroleum Mining Act (1976) control the exploration, prospection and mining of petroleum.
- The *Wild Animal and Birds Protection Act* (1966) which includes protections for turtles, seabirds, and the whale shark. This Act may soon be updated to provide protections for additional marine species (e.g. sharks and rays listed on Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals).
- The *Maritime Safety Authority Act* (2019) which regulates shipping and navigation, ship groundings and oil spills.
- National *Fish Aggregating Devices (FAD) Management Plan* describes the requirements for the use of FADs in the tuna fishery, including the number of FADS that can be deployed, FAD markings and identification, and the deployment and retrieval of drifting FADs.

3. Management Area Pressures and Issues

The focus of the Cosmoledo and Astove Archipelago Sustainable Use Area Management Plan is to provide overarching guidance for how the Area is managed within the broader SMSP initiative, balancing nature conservation with a range of allowable activities that include fisheries, marine infrastructure, non-renewables and prospecting, tourism and recreation, and research. The scope of management strategies covers ecological and biodiversity, governance, social and cultural, and economic themes.

This Management Plan has been developed with consideration of the key issues and threats identified during stakeholder workshops in 2022, and is aligned with the principles agreed by stakeholders (Section 3.1) and with the guiding principles of the SMSP initiative[5].

3.1 Key principles

The Key Principles used to guide the development of this Management Plan were derived from stakeholder consultation workshops held in 2022, and consider the guiding principles of the SMSP

[5] https://seymsp.com/the-initiative/guiding-principles/#:~:text=Transparency%2C%20inclusivity%20and%20participation%20are,to%20improve%20ecological%20sustainable%20development.

initiative. The principles arising from this process are summarised in Table 2. These are based on global principles (Green et al. 2020) and two types of principles were derived:

- ***Biophysical*** - principles aimed at achieving ecological objectives by taking key biological and physical processes into account.
- ***Socioeconomic and cultural*** - principles aimed at maximising benefits, minimizing conflicts and minimizing costs to local communities and industries.

Table 2. Key principles identified by stakeholders to guide the development and implementation of the Cosmoledo and Astove Archipelago Sustainable Use Area.

Biophysical Principle	**Cosmoledo & Astove Archipelago context**
Represent Habitats	Manage 50–100% of each major habitat, including coral reefs, mangrove forests and seagrass meadows
Manage Critical, Special and Unique Areas	Manage critical areas or habitats for: - seasonal and spatial protection of fish spawning aggregations (key species) - spatial protection of important seabird areas, seasonal for breeding periods - protect areas of high coral reef, seagrass and mangrove biodiversity - seasonal and spatial protection of marine turtle nesting areas - preserving important sites of national and international significance for management of focal species (e.g. Ramsar sites)
Incorporate Connectivity	Consider: - variations in oceanography - areas to sustain adults and juveniles of important fisheries species - maintaining connectivity of endangered or fisheries species across national boundaries – juvenile tiger sharks
Support Larval Dispersal	- Include whole habitat units to be self-sustaining - Establish networks of habitats close enough to be connected by larval dispersal - Protect spatially isolated areas of habitat - Protect larval sources (e.g. seasonal spawning closures)
Promote Recovery	- Establish long-term (>20 years) management
Manage Healthy Areas to reduce Local Threats	- Manage healthy habitats to reduce threats from local threats, such as vessel anchoring; identify and designate areas for safe anchorage to provide sheltered locations in different conditions but not on coral reefs or seagrass; minimise trampling of seagrass by fishers - In areas where populations of important species are under pressure due to local threats, protect seabirds from disturbance particularly during breeding season by limiting island visits
Adapt to Changes in Climate and Ocean	- Manage sites likely to be more resilient to global environmental change (refugia) – shallow and deep reefs - Manage ecologically important sites that are sensitive to changes in climate and ocean chemistry - Increase protection of species that play an important functional role in ecosystem resilience, e.g. sharks
Socio-economic Principle	**Cosmoledo & Astove Archipelago context**
Involve Stakeholders in	- Involve all stakeholders in each step of the process - Consider opportunities for collaborative management and implementation among all stakeholders

Planning and Establishing the Sustainable Use Area	- Implement balanced and fair governance and management
Ensure Fair and Equal Access and Use	- Ensure local communities have fair and equal access to, and use of, marine and fisheries resources - Ensure no one sector has increased access and avoid exclusive use of marine and fisheries resources - Support management actions that maintain or increase ecosystem goods and services for local communities – according to policy and codes of conduct
Support Multiple, Environmentally Friendly Uses	- Allow for multiple sustainable uses (including sustainable fishing, tourism, aquaculture, education and research, exploration) in line with government policy, codes of conduct and regulations - Resolve conflicting uses through negotiation and compromise between stakeholders
Support Local Livelihoods	- Support sustainable livelihoods – artisanal fisheries, aquaculture, sport fishing, and marine eco-tourism - Support local jobs through artisanal and industrial fisheries and commercial tourism
Enhance MCS and Rapid Response	- Increase capacity for military and enforcement agencies for rapid response to infringements - Increase cross-party communication on Illegal, Unreported, Unregulated fishing (IUU)
Revenue Optimization	- Increase high-value, low-impact industries through sustainable development and management (e.g. bird watching) - Improve knowledge of the area through educational visits and awareness program

3.2 Priority issues

There are several *pressures* that pose risks to the social, cultural, economic, ecological and biodiversity values of the Cosmoledo and Astove Archipelago. Understanding drivers and pressures for the Cosmoledo and Astove Archipelago Sustainable Use Area can inform conservation priorities to mitigate the impacts of current and future change on the marine ecosystem. The following definitions are offered (Oesterwind et al. 2016):

Drivers are *complex phenomena governing the direction of ecosystem change, which could be of human and/or nature origin*. Drivers are considered beyond the direct control of management, for example anthropogenic drivers are based on economic, social and political fundamental needs (demands) for food, clean water, employment, transport and energy. While natural drivers are independent from anthropogenic causes and could be referred to as "force majeure", such as earthquakes, volcanic eruptions or tectonic drift.

Pressures are the result of a driver-initiated mechanism (human activity or natural process) causing an effect on any part of an ecosystem that may alter the environmental state. Management can have a direct influence on the intensity, direction and occurrence of pressures, which include climate change, extractive fishing and shipping, as examples.

In combination, these drivers and pressures create issues that occur in a specific area, and understanding these relationships can help identify the most effective and appropriate management response. For example, illegal fishing by foreign fishing vessels may be identified as a high priority issue. Understanding the nature and resulting impact of this pressure can aid managing authorities to prioritise their response, and design the most effective countermeasures. Meanwhile, understanding the drivers behind this pressure may highlight additional steps that can be taken through other means, for example, diplomatic efforts or regional measures that may help to address the underlying causes driving illegal fishing.

A global assessment of the overlap in the distributions of different pressures has important implications for biodiversity change attribution and the potential for interactive effects and found anthropogenic threat complexes that explain patterns of biodiversity and ecosystem change (Bowler et al. 2020). At a regional scale, in the Indian Ocean, the primary pressures on biodiversity and ecosystem condition were climate change followed by human use (extraction), with human population, pollution and biosecurity risks (invasive potential) negligible and well below the global median.

At a national scale, drivers and pressures that have been identified include climate change, small land area (thus requiring reclamation that has impacted coastal environments), high dependence on a few industries, including tourism, fisheries, ICT and shipping, most of which occur in the marine environment, concentration of the population in the coastal zone, remoteness, limited capacity and lack of resources (Government of Seychelles 2019, 2020). These are important considerations for this Management Plan.

At a local scale, the pressures and issues they cause were identified and ranked by stakeholders for the Cosmoledo and Astove Archipelago Sustainable Use Area, and fall into four themes: ecological and biodiversity, governance, social and cultural, and economic (Table 3). There are priority issues that were ranked highly by stakeholders and/or appeared under multiple themes and these are highlighted in blue in Table 3. While these priority issues are the focus of the management strategies in Section 4, all issues raised were considered during the action development stage.

Table 3. Priority issues identified and ranked by stakeholders in four thematic areas for the Cosmoledo and Astove Archipelago Sustainable Use Area. Issues in blue are those that this Management Plan could address.

Ecological & Biodiversity:	**Governance:**
1. **Lack of research, monitoring and baseline data** 2. **Illegal Unregulated and Unreported fishing (IUU) and poaching** 3. **Lack of biosecurity measures, introduced species impacts** 4. Explore options to transition away from fly fishing to other activities 5. **FADs and marine debris** 6. **Declining shark populations** 7. **Unsustainable management and use of resources** 8. **Potential pollution from aquaculture** 9. **Lack of waste management from visiting vessels and tourism (sewage & litter)** 10. **Anchor damage to marine habitats (no designated safe anchorages)** 11. Increased people on islands disturbing seabird populations 12. **Climate change effects** 13. Cyclone damage to marine habitats 14. **Invasive aquatic species around islands impacting marine ecosystem recovery**	1. **Illegal Unregulated and Unreported fishing (IUU) and poaching** 2. **Lack of effective EIA processes and site management** 3. **Lack of enforcement capacity, capability and monitoring** 4. **Transparency on how conservation funds are managed and used** 5. **Equity of access to the Area** 6. **Lack of trained personnel to conduct management** 7. **Lack of stakeholder participation in management processes** 8. **Length of time for coastguard to respond** 9. **FAD management and governance** 10. **Lack of cooperation and communication between stakeholders** 11. **Lack of sector management plans for fishing and tourism** 12. **Remoteness and associated complications due to distance and cost**
Social & Cultural:	**Economic:**
1. **Lack of access for Seychellois citizens** 2. **Lack of understanding of the Area's ecological values** 3. **Lack of cooperation and communication between stakeholders** 4. **Lack of transparency about conservation activities and investment** 5. **Visiting vessels not following sustainable practices (recreational, fishing, island visits)**	1. **Lack of funds and resources for compliance and enforcement** 2. **Lack of resources for management and protection** 3. **Lack of data on artisanal fishery** 4. **Equity in economic opportunities**

3.3 Pressures and threats

The Cosmoledo and Astove Archipelago Sustainable Use Area faces numerous pressures and threats. Some of these threats were identified specifically for the Area during stakeholder workshops while others are pressures and threats known from across the Seychelles EEZ. These pressures and threats are:

- **Lack of monitoring and baseline data on the ecosystem and it's uses, and lack of scientific understanding:** stakeholders identified that the Cosmoledo and Astove Archipelago Sustainable Use Area contained systems that were rich and diverse, but were understudied and that baseline data on the status and trends of many aspects of the Area were unavailable, and there was a lack of critical understanding about how the biophysical

and ecological processes occurring, and how the Area is being used. These knowledge gaps need to be addressed to ensure evidence-based management.

- **Unregulated fishing:** there are no formal and regulated fisheries management plans for the Seychelles outer islands including the Cosmoledo and Astove Archipelago Sustainable Use Area. As a result, there is no indication on the level of fishing pressure that the shallow areas around each of the islands can support. Fishing for sea cucumber within the area is controlled by output measures which specifies the number of pieces of each of the three harvested species that can be removed, but there is no annual catch limit by area. There is no national level management of fly fishing in the area.
- **Illegal and unreported fishing:** illegal and unreported fishing and poaching was repeatedly raised as an issue facing the entire Seychelles EEZ. In the Cosmoledo and Astove Archipelago Sustainable Use Area, illegal fishing and poaching especially by foreign vessels from Madagascar and the Comoros. Domestic fishing issues was reported as unreported fishing and poor fishing practices, while foreign vessels were illegally fishing in Seychelles waters.
- **Wildlife poaching:** The poaching of protected wildlife is an important threat for biodiversity in the Cosmoledo and Astove Archipelago Sustainable Use Area, especially on Cosmoledo Atoll where poaching camps have been discovered on Menai island. Poaching of sea turtles, particularly the IUCN classified "Endangered" green turtles for meat as well as bird eggs of sooty terns (*Sterna fuscata*) and brown noddies (*Anous stolidus*) and meats of the tropical shearwater (*Puffinus bailloni*) and wedge tail shearwater (*Ardenna pacifica*). The IUCN classified "Vulnerable" coconut crab (*Birgus latro*) is not protected locally but is threatened by human consumption and numbers have dwindled dramatically on many islands throughout the Seychelles.
- **Lack of management and enforcement capacity, capability, and funding (including transparency):** stakeholders raised concerns regarding the challenges facing effective compliance and enforcement in the Cosmoledo and Astove Archipelago Sustainable Use Area. The Area's remoteness makes monitoring and surveillance challenging and costly, and concerns were raised that there was insufficient capacity and capability to effectively enforce management in the Area. Stakeholders also raised concerns about a perceived lack of transparency about funding to manage and conserve the Area.
- **Lack of effective Environmental Impact Assessment (EIA) and management:** stakeholders raised concerns that EIA processes needed to be strengthened and development conditions enforced to prevent damage to the Area from developments and facilities.
- **Lack of access for Seychellois:** stakeholders raised concerns over a lack of equitable access to the Cosmoledo and Astove atolls, citing concerns over lack of clarity and transparency about access rights and opportunities. This lack of access contributed to a lack of understanding about the values of the Area and an associated lack of stewardship and engagement in management.
- **Lack of biosecurity measures:** stakeholders raised concerns over the potential biosecurity threats facing the unique ecosystems of the Cosmoledo and Astove areas, where

introduced species such as weeds, insects, and even domestic animals can have devastating effects on these unique ecosystems. While this threat is acknowledged, this Management Plan can only implement actions below the mean high-water mark, and threats to terrestrial island flora and fauna need to be addressed through other means.

- **Climate change:** Climate induced increase in seawater temperature has been recorded in the AFB area along with periods of mass coral bleaching events caused by high sea temperatures. High level of dissolved inorganic carbon has also been linked to impacts in marine organisms such as corals (Hill & Hoogenboom, 2022; Kaniewska et al., 2012), echinoderms (Dupont et al., 2010) , gastropods (Bibby et al., 2007; Melatunan et al., 2013).
- **Marine debris:** Accumulation of marine plastic waste on the beaches of the islands is a widely raised issue across the Seychelles EEZ. Dispersal simulations indicate that most of the terrestrial marine debris that reaches the beaches of the Seychelles southern islands originates from South East Asia (Duhec et al., 2015; Vogt-Vincent et al., 2023) as well as from the tuna purse seining industry in the form of drifting Fish Aggregating Devices (Balderson & Martin, 2015; Duhec et al., 2015; Zudaire et al., 2018).
- **Indiscriminate anchoring:** Indiscriminate anchoring in shallow areas within the AFB causes damage to coral reefs through physical destruction of fragile coral skeletons and to seagrass beds by ploughing up the roots during anchor retrieval.

4. Management Strategies

This section describes the activities that are permitted to occur within Cosmoledo and Astove Archipelago Sustainable Use Area, and provides strategies and actions identified to address the priority issues, goal and objectives for the Area (Figure 3). The Allowable Activities for this Area have been drafted under the Seychelles Marine Spatial Plan process and yet to be finalised. The Allowable Activities that may occur within the Cosmoledo and Astove Archipelago Sustainable Use Area with provisional conditions from the management strategies and actions are detailed in Table 4.

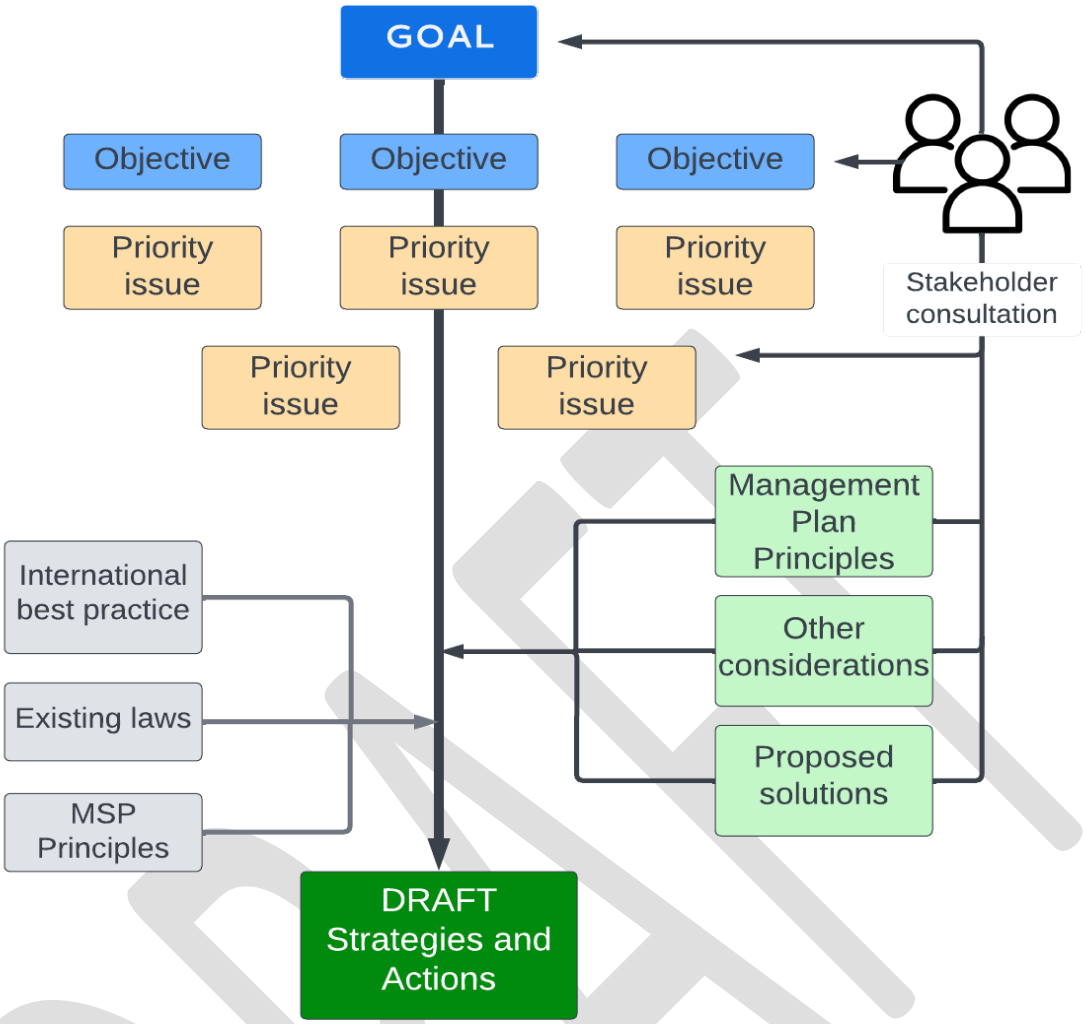


Figure 3. Process and information used to develop the strategies and actions in this Management Plan.

4.1 Sustainable use allowable activities

The list of allowable activities for Sustainable Use Areas that includes a provisional schedule of conditions to support the management actions are detailed in Section 4.2 and Table 4. The draft Allowable Activities table, zoning codes for activities, and definitions of each activity are provided in Appendix B. All activities and uses will be conducted in accordance with applicable national laws, regulations, and policies, as well as applicable international laws, treaties, and agreements.

All existing national laws, regulations, and policies, as well as applicable international laws, treaties, and agreements apply and must be complied with. These include the Fisheries Act and Regulations (2014), FAD Management Plan, Sea Cucumber Management Plan, Environment Protection Act (2016), Maritime Safety Authority Act (2019), Wildlife Bill (draft 2023), and Petroleum Mining Act (1976). The rules of these legislation are not replicated in the strategies below, but their intent is reflected in all actions.

Furthermore, until such time as operational elements of this Management Plan, such as the national permit system commence, existing management arrangements will continue to apply.

4.2 Management strategies and actions

This section identifies the management strategies to be implemented to address the identified priority issues, and to deliver sustainable use of the Cosmoledo and Astove Archipelago. These management strategies were developed through a consultative stakeholder participation and review process during which management actions were drafted based on the allowable activities for the SMSP Sustainable Use Areas (Zone 2). Each of the management strategies is mapped against the management plan objective it addresses.

Seven management strategies have been identified for this Cosmoledo and Astove Archipelago Sustainable Use Area. Each strategy is comprised of several specific actions. Where an action requires further consultation, e.g. setting capacity limits, such consultation must be done in accordance with one of the following Guiding Principle of the SMSP: *Transparency, inclusivity and participation are cornerstones of the engagement, consultation and communication with stakeholders and civil society*. Further explanation of the rationale for each management action is provided at Appendix C.

Ecological and Biodiversity objective: To maintain and enhance the unique biodiversity, ecological values and integrity.

Strategy 1: Minimise human impacts to maintain ecological values.

1.1	Designate anchorage areas (and if feasible provide moorings) to reduce damage to coral reef and seagrass habitats.
1.2	Identify and implement fishing limits for high-risk species or during vulnerable life history stages for key species (e.g. during spawning aggregation and nursing periods).
1.3	Establish no discharge zones for wastewater and ballast water within 2 km of islands and atolls by vessels more than 15 m in length.
1.4	Implement programs to reduce impacts of marine litter and pollution on marine wildlife, e.g. beach clean-ups, awareness campaigns.
1.5	Establish and enforce aircraft corridors to minimise disturbance to seabirds.

Strategy 2: Minimise anthropogenic pressures on threatened and endangered species.

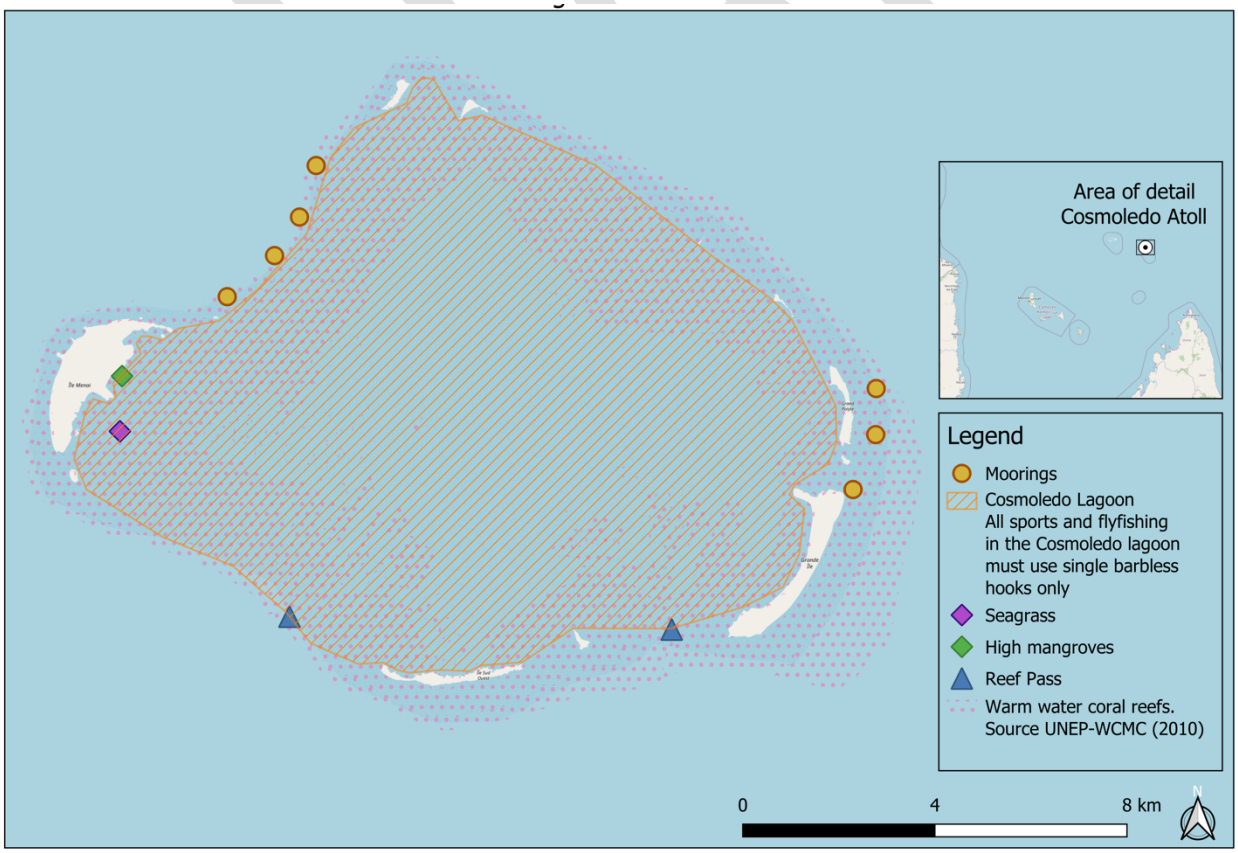
2.1	Investigate options for management of aggregation sites and ecological corridors for megafauna, threatened and endangered species.
2.2	Retrieve drifting FADs of high risk to habitats and species.
2.3	Remove stranded FADs of high risk to habitats and species.

Strategy 3: Minimise impacts of fishing on marine resources to maintain sustainable fisheries (Interim)

This Strategy concerns sustainable fishing and acknowledges that fisheries management is primarily the responsibility of the Seychelles Fishing Authority (SFA) which sets conditions such as licenses, quotas, protected species, and technical rules about how fishing is to be conducted.

These arrangements are implemented through Fisheries Regulations and Fisheries Management Plans. Currently, the *Seychelles Fisheries Regulations* 1991 excludes foreign fishing vessels and industrial fishing vessels (vessels > 24 m in length) from the Area, however, there are no fisheries management plans that specifically apply to the Cosmoledo and Astove Archipelago. In order to address the issues raised and solutions proposed by stakeholders during the consultative process, this ***interim Strategy*** includes actions focused on fishing in the Area until such time as fisheries management arrangements, such time as an *Outer Islands Fisheries Management Plan* or equivalent, for the Area have commenced.

3.1	Promote and contribute to the update of the national FAD management plan to ensure that it addresses national priorities.
3.2	Require the use of best practice guidelines for catch and release fishing, including fish with signs of barotrauma.
3.3	All lagoon fly fishing shall be catch and release only.
3.4	All catch and release fly fishing (lagoon) must use single barbless hooks only.
3.5	Establish a national training and accreditation scheme for fly fishing (lagoon) guides, with only accredited guides able to lead fishing charters.
3.6	Establish and implement appropriate catch limits and gear restrictions for sport and recreational fishing.
3.7	Prohibit all fishing in reef passes leading into lagoons between 1st November and 1st March.



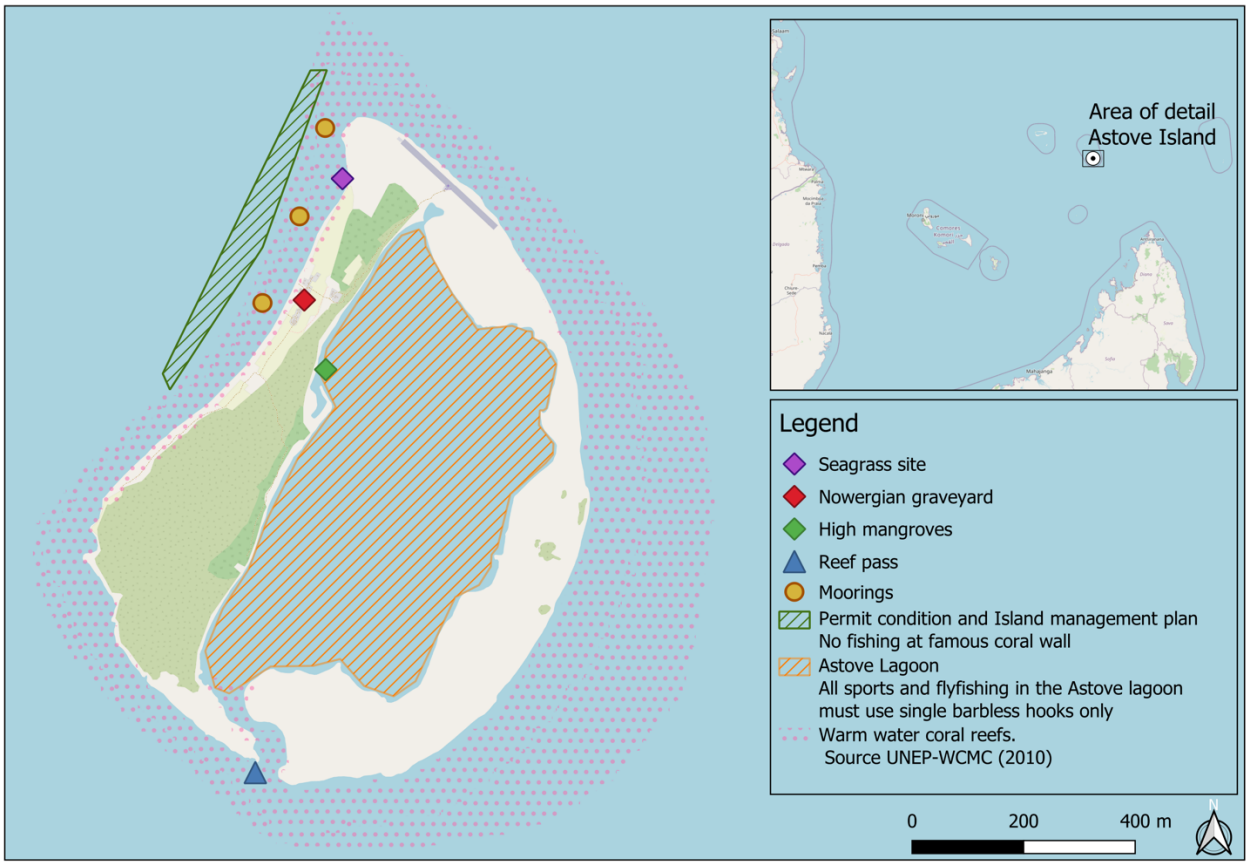


Figure 4. Maps of Cosmoledo and Astove atolls showing potential anchorage areas to be used year-round with sites for different weather conditions, reef passes, catch and release only fishing areas, and a no fishing designated area.

Governance objective: To ensure management processes are transparent, equitable and participatory, and deliver effective monitoring, compliance and enforcement.

Strategy 4: Establish governance arrangements that are participatory and transparent, that enhances equitable and effective management.

4.1	Establish a single multi-sectoral representative management committee to provide strategic decision making and oversee implementation.
4.2	Establish a complaints and resolution framework that involves an independent body.
4.3	Establish and implement a transparent and equitable permit system.
4.4	Determine capacity limits for allowable activities that may impact marine habitats and species.
4.5	Develop new or review existing Codes of Conduct for allowable activities.
4.6	Design and implement a system for allocating permits that is equitable for all stakeholders.
4.7	Establish a financial framework to ensure permit application fees and commercial levies support management and implementation.
4.8	Develop and implement a financial framework to support management that includes sustainable funding mechanisms

Strategy 5: Enhance and facilitate research and monitoring to provide the information needed to support evidence-based decision making.

5.1	Establish a scientific committee to provide technical advice, coordinate and facilitate research and monitoring activities, and oversee the research permitting processes.
5.2	Develop and implement a Research & Monitoring Strategy for marine Sustainable Use Areas.

Strategy 6: Enhance and maintain effective compliance and enforcement.

6.1	Develop and implement a risk-based Compliance and Enforcement Plan to support implementation and inform co-management agreements.
6.2	Optimise use of surveillance and detection technologies for monitoring and management of illegal activities.

Social & Cultural objective: To facilitate equitable access and opportunities for Seychellois to maintain and enhance social benefits and cultural values.

Strategy 7: Enhance opportunities for Seychellois and visitors to visit, experience, learn about, understand, and appreciate the Area.

7.1	Implement education and awareness programs to raise awareness of the values of the Area and management measures to protect them.
7.2	Prohibit fishing along the famous Coral Wall dive site (northwest side of Astove Island) (Figure 4).
7.3	Increase opportunities for locals to visit the area.

Economic objective: To optimise and diversify sustainable economic activities, and facilitate equitable access to economic opportunities.

Strategy 8: Promote and support sustainable industries and opportunities for a range of eco-friendly local businesses and livelihoods, and ensure that economic activities contribute to management.

8.1	Undertake a baseline social and economic valuation to inform capacity limits, potential development or expansion of sustainable local businesses, and management decisions.

Table 4. Allowable activities in Sustainable Use (Zone 2) Areas and provisional schedule of conditions that relate to management actions for permits, codes of conduct, environmental and social impact assessments (ESIA), and security bonds. Note this is proposed as part of this draft Management Plan and not officially endorsed. ***Legend: A allowable (no conditions); C allowed with conditions; X prohibited; √required; - not required.***

Sectors	Marine Activity	Allowable activity	Permit (or license)	Area / site capacity limits	ESIA	Security bond	Code of Conduct	Fee or levy	Responsible Agency
Fisheries	Aquaculture	C	√	√	√	√	√	√	Seychelle Fishing Authority (SFA)
	Aquaculture, coral farming	C	√	√	√	√	√	√	SFA
	Artisanal Fishing (multiple gear types)	C	√	-	-	√	-	√	SFA
	Fly Fishing, blue water	C	√	-	-	-	√	√	SFA
	Fly Fishing, lagoon	C	√	√	-	-	√	√	SFA
	Industrial Pelagic Longline	AFB only	√						SFA
	Industrial Purse Seine (free school)	AFB only	√						SFA
	Industrial Purse Seine (floating objects, dFAD)	AFB only	√						SFA
	Industrial Purse Seine (supply vessel)	AFB only	√						SFA
	Recreational Fishing	C	-	-	-	-	-	-	SFA
	Semi-industrial Hand Gathering	C	√	-	-	-	√	√	SFA
	Semi-industrial Hook & Line	C	√	-	-	-	√	√	SFA
	Semi-industrial Longline	C	√	-	-	-	√	√	SFA
	Sport Fishing (multiple activities)	C	√	-	-	-	√	√	SFA
	Subsistence Fishing	C	-	-	-	-	-	-	SFA
Maritime Infrastructure	Ballast and Bilge Dumping	X							
	Bunkering at sea	C	√	-	-	-	-	-	Seychelles Maritime Safety Authority (SMSA)
	Bunkering at sea, Fishing vessel	X							
	Commercial shipping	C	-	-	-	-	-	-	SMSA
	Desalination, boat-based	A	-	-	-	-	-	-	SMSA
	Desalination, land-based	C	√	√	√	√	-	-	Seychelles Planning Authority (SPA) & MACCE
	Disposal, dumping, dredge spoils	X							
	Dredging, coastal	C	√	√	√	√	√	√	MACCE/SPA
	Ferries and Transportation	C	√	-	-	-	-	-	SMSA/Tourism Department

Sectors	Marine Activity	Allowable activity	Permit (or license)	Area / site capacity limits	ESIA	Security bond	Code of Conduct	Fee or levy	Responsible Agency
	Patrols and Surveillance	A	-	-	-	-	-	-	NISCC
	Ports, Marinas, Wharves, Jetties	C	√	√	√	√	-	√	MACCE/SPA
	Reclamation	X							
	Renewable Energy, deep water thermal	X							
	Renewable Energy, solar (marine)	X							
	Renewable Energy, tidal	C	√	√	√	√	-	√	MACCE
	Renewable Energy, wind (offshore)	C	√	√	√	√	-	√	MACCE
	Renewable Energy, wave	C	√	√	√	√	-	√	MACCE
	Underwater Cables	C	√	√	√	√	-	√	MACCE
Non-renewable & prospecting	Bioprospecting Development	C	√	√	√	√	-	-	PetroSeychelles
	Deep-sea Mining	X							
	Petroleum Geophysical Surveys, Exploration	C	√	√	√	√	-	√	PetroSeychelles
	Petroleum Exploration, Drilling	C	√	√	√	√	-	√	PetroSeychelles
	Petroleum Development, Production, Extraction	C	√	√	√	√	-	√	PetroSeychelles
	Sand Mining	X							
Tourism & Recreation	Anchorages and Mooring Buoys	C	-	-	-	-	√	-	MACCE
	Floating structures	C	√	√	√	√	√	-	MACCE
	Hire craft	C	√	√	-	-	√	√	Tourism Department
	Motorised Activities (Watercraft, Ship)	C	√	√	-	-	√	√	Tourism Department
	Non-Motorised Activities	C	-	-	-	-	√	√	Tourism Department
	Passenger ships	C	√	√	√	-	√	√	SMSA/ Tourism Department
	Tourism Accommodation, marine	C	√	√	√	√	-	√	MACCE
	Tourism Accommodation, terrestrial	C	-	√	√	√	-	√	MACCE
Research	Bioprospecting Research	C	√	√	√	-	-	-	SPS
	Scientific Geophysical Surveys, Research	C	√	√	√	-	-	-	SPS
	Scientific Research and Monitoring	C	√	-	-	-	√	-	SPS
	Hydrographic Surveys	C	√	√	√	-	-	-	SPS

4.3 Enabling policy and regulations

The available existing legislation has been examined and the Nature Reserves and Nature Conservancy Act (2022) (NRNC Act) has been identified as the appropriate legal instrument currently for designation of protected areas. The NRNC Act has objectives to provide for the protection and conservation of landscapes, seascapes, ecological diversity and the sustainable use of biological diversity by achieving an effective and multi-use protected area system that is representative, comprehensive and balanced, thereby maintaining the highest quality examples of ecosystems within the country by engaging all stakeholders.

Once the Nature Reserves and Nature Conservancy Act (2022) comes into force, the Zone 2 medium biodiversity conservation and sustainable use areas will be gazetted as (Marine) Sustainable Use Areas. Until this legislation comes into force, the Zone 2 areas are gazetted using the '(Marine) Area of Outstanding Natural Beauty' category. When enacted, this legislation will provide the principal legislative framework under which sustainable use areas will be managed.

Legal implications

Legislation is needed to gazette SMSP Zone 2 areas in a "sustainable use area" (IUCN VI) category of "protected areas", for a conservation and sustainable uses objective. For Milestone 1, 2 and 3, the SMSP Executive Committee applied the Nature Reserves and Nature Conservancy Act (NRNC Act) for designation. The amended NRNC Act will be used to designate the "sustainable use area" category for "protected areas" with the objective for conservation and sustainable uses.

Regulatory implications

For implementation of the SMSP, the concept of an independent Seychelles Ocean Authority is being explored as per agreement by Cabinet in July 2018 and a final report that was submitted December 2018. A new Seychelles MSP Policy was drafted and approved in 2020.

Draft Allowable Activity tables and management considerations for all areas have been developed through stakeholder consultations and public workshops. With assistance from SWIOFish3, management plans will be developed, including alignment with regulations.

Monitoring, control and surveillance (MCS) is being explored with the Regional Coordination Operations Centre (RCOC), Seychelles Coast Guard, and National Information Sharing Coordination Centre (NISCC).

5. History and Values of the Area

The Seychelles is a small island nation of about 115 tropical islands (both granitic and coralline) with a population of approximately 98,000 people (United Nations 2022[6]), mostly living on the Inner Islands. Located in the western Indian Ocean northeast of Madagascar, the country is widely known as a large ocean state with an Exclusive Economic Zone (EEZ) of 1.4 million km² and a land area of 459 km². The Cosmoledo and Astove Archipelago is in the south of the Seychelles EEZ near the border with Madagascar, covering 14,482 km^2 and representing 1.07% of the total EEZ area.

5.1 History of the site

The Cosmoledo and Astove Archipelago Sustainable Use Area covers 5,321 km^2 representing 0.39% of the Seychelles EEZ.

Cosmoledo Atoll

Cosmoledo is a raised atoll formed of irregular platforms of fossilized coral limestone 2-4 metres above sea-level. It is a more typical atoll than Aldabra itself, although erosion is advanced. At its longest and widest points the atoll is approximately 13 km by 16 km, with a total area of 139.17 km^2. Just 3.2% of this (444 ha) is land. There are 8 main islands in the Cosmoledo atoll system, the largest Menai at 250 ha and Grande Ile at 160 ha; others include Pagode, Grand Polyte, Ile du Nord and Ile du Sud-Ouest. Along with a further 11 islets and extensive reef flats these form a rough ellipse around the atoll's rim, enclosing a shallow lagoon of almost 6,500 ha drained by two channels to the southeast. Beyond the peripheral reef the seabed slopes away gently then more steeply into depths of over 2,000 metres around 1.5 km offshore.

Cosmoledo was administered as part of Mauritius until 1903, when it became a British crown colony. The Atoll has been severely affected by human settlement over its history with early attempts to establish agriculture. Mangrove bark and poles were exported to Mahé, the former dried as a source of tannin. Guano mining began early in the 20th century with significant impacts upon the vegetation and wildlife. Settlers and visitors also introduced species such as goats, pigs and rats to the islands. Marine resources such as '*Calipee*' (turtle cartilage) and salted meat, flippers and intestines were produced from Green Turtles and sent to Mahé, and oil was made from the eggs, heart and internal surface of the carapace. A cold store had been installed at Menai and up to twenty fishermen caught 15-20 tonnes of fish per month. Up to ¾ million Sooty Tern eggs were collected during the SE monsoon and shipped to Mahé on the refrigerated supply boat.

The Island Development Company (IDC) took over administration in the 1980s and remains the main activity on the Cosmoledo islands. In part due to safety concerns over islands without airstrips, the IDC withdrew its staff from the other islands in 1992. This resulted in steadily increasing pressure on fisheries, turtles, sea cucumbers, seabirds and eggs, from Seychelles vessels but also from illegally operating vessels from the south.

Astove Atoll

Astove is a raised atoll with just a single break in the southwest, the Gueule Bras channel. It stands on a volcanic peak reaching up over 4,000 metres from the ocean floor, with Cosmoledo standing on a similar peak 35 km to the north. Of the total area of 16.16 km^2, 5.36 km^2 island, 6.60 km^2 lagoon and the remainder reef. The lagoon is unusually shallow, with a strikingly milk-white

[6] https://population.un.org/wpp/

appearance, and it has been suggested that Astove may in fact have its origins as a reef flat on which the lagoon has developed through slow dissolution of the carbonate by rainwater acidified by interaction with the soils.

The early history of Astove is obscure. Many vessels have been wrecked on its reef, among them a Portuguese slave trader, the Dom Royal in 1760, whose survivors remained on the atoll for perhaps as long as 40 years. Astove was administered from Mauritius between 1814, when Mauritius passed from French into British administration in 1903. At the time, a small settlement had been established and a few hundred coconuts, tomatoes, and pumpkins had been planted and 60 ha cleared for maize, but the atoll was later deserted. During the 20s and 30s, up to 400 Green Turtles a year were being taken, and in 1937 the bones of turtles taken at Astove, Cosmoledo and Assumption were shipped to Aldabra to be ground into bone meal for export.

It is known that over 72,000 tons of guano of phosphate were exported between 1927 and 1960, leaving reserves of less than 5,000 tons. Guano mining stripped away spoils and vegetation and likely had significant ecological impacts.

During the late 1960s the Veevers-Carter family took on a 99-year lease and constructed a small airstrip and turtle hatchery. Goats, turkeys, ducks, cattle and Aldabra Giant Tortoises were introduced. A number of houses were built, including copra processing plant, chapel, workers' houses and a large 14-room family house. The tenancy of the Veevers-Carters ended with the sudden death of Mr Veevers-Carter in 1970, and permanent settlement ceased not long after. This resulted in steadily increasing poaching pressure on fisheries, turtles, sea cucumbers, seabirds and eggs, by Seychellois vessels but also by vessels from Madagascar and Comoros. Astove is only around a day's sailing from northern Madagascar, but three or four days from Mahé, Praslin and La Digue. The small airstrip fell into disrepair.

Astove came under the control of the Islands Development Company (IDC) in the early 1980s. Income over subsequent years was derived from seasonal harvesting of turtles and salt fish, Astove lacking Cosmoledo's Sooty tern colony for egg-harvesting and its extensive mangrove forest to provide poles and bark for export. In 1983 IDC stopped paying workers for Hawksbills, although live and salted Green Turtles were still exported to Mahé.

Overall, the uses and biodiversity present on Cosmoledo and Astove atolls today reflects the history of human settlement and use. Impacts on the Area's biodiversity includes:

- Habitats modified by guano excavation and planting of Coconuts.
- Introduction of alien species of mammal (rats, cats, pigs, goats) and plants (Coconut, Casuarina, Agave).
- Exploitation of turtles, fish, molluscs, seabirds and seabird eggs for food and income.
- Extinction of seabird colonies.
- Extinction of at least seven species of land-bird (Rail, Coucal, Blue Pigeon, Madagascar Turtle Dove, Pied Crow, Bulbul, Fody), all of which survive on Aldabra.
- Reduction of shark and sea cucumber populations.

5.2 Surrounding features

The Cosmoledo and Astove Archipelago sits within the Western Indian Ocean Marine Ecoregion (WIOMER), Cosmoledo is part of the Aldabra group at the south-western limit of the Republic of Seychelles' Outer islands. Astove is the closest island 38 km to the south, Aldabra itself lies 110

km to the west, and Assumption is 90 km to the west. Mainland Africa lies 700 km to the west and Madagascar 400 km to the southeast. The Archipelago shares biogeographic similarities with the Aldabra group and is distinct from the northern islands of the Seychelles archipelago. The atoll's vegetation and terrestrial invertebrates show strong affinities with the Malagasy region.

Seychelles' ocean ecosystem is impacted by the Indian Ocean Gyre, and mostly influenced by the eastward flowing Equatorial Counter Current and the two westward flowing currents, which are the North Equatorial Current and South Equatorial Current during the Northwest trade wind. During the Southeast monsoon, the Equatorial Counter Current and North Equatorial Current disappear and major currents that drive the circulation within Seychelles region are the South Equatorial Current and the Somali Current (ASCLME 2012a).

5.3 Values

As identified through the 2019 SMSP nomination process, the Area contains 40 biodiversity features, 15 of 44 habitat conservation features and 25 of 38 species conservation features including 5 birds, 13 cetaceans, 6 deep water, 4 shallow water, 1 BirdLife Important Bird Area, turtle nesting and foraging habitats, 1 WIOMER site. The Area has a 100% overlap with all cetaceans except Orca at 95%. WIOMER covers 100%. Canyons cover 7%, continental slope covers 92% and abyssal features cover 22%.

5.3.1 Ecological

The Cosmoledo and Astove Archipelago Sustainable Use Area represents pelagic waters and shallow waters surrounding the Cosmoledo and Astove atolls. This area contains two shallow water habitat types. In deep waters, it includes canyons, continental slope, and abyssal plains and hills. The Area overlaps with Western Indian Ocean Marine Ecoregion (WIOMER) and BirdLife Important Bird Areas. A westward, equatorial current flows along the bottom portion of the Seychelles EEZ.

Marine diversity is exceptional with healthy and diverse coral and reef fish communities. There are large Dogtooth Tuna and Napoleon Wrasse on the reef's outer edge and a small number of Giant Grouper (now rare in Seychelles) persist in caves along the outer wall. Offshore waters feature large pelagic predators such as Sailfish, Wahoo and Yellowfin Tuna, indicating a highly productive marine environment crucial to seabirds and cetaceans.

Mangroves make up one quarter of Cosmoledo land area, mainly in the form of dense forest up to 6 metres tall, particularly on the lagoon side of Menai. Six species are present. Mangrove habitat in Seychelles is in decline, largely due to development in the Inner islands. The lagoon holds large populations of molluscs and crustacean, including the impressive Blue Mangrove Crab which has been heavily exploited for food in the inhabited islands. The Robber Crab, the world's largest terrestrial invertebrate, is similarly exploited.

The coral reef outer walls of the Cosmoledo and Astove atolls, shelving steeply away into depths of over 2,000 m, with its diverse coral and reef fish community, turtles, and marine predators is considered amongst the best dive sites in the world. The north and northwestern reefs of Cosmoledo are viewed as especially important, and the reefs of Astove have been named "the most spectacular in the world" by renowned underwater photographer Stan Waterman. The Coral Wall on the north western side of Astove was featured in the pioneering 1956 film Silent World by Jacques Cousteau and Louis Malle and is claimed to be the best dive location in the Seychelles.

Waters surrounding Astove were explored during the Nekton Expedition, April 2019. New deep-water coral habitats were located, and submersible transects indicated very high biodiversity compared to other islands or atolls in the EEZ.

5.3.2 Species of conservation interest

The Cosmoledo and Astove Area has numerous species of conservation interest. The Endangered green turtle (*Chelonia mydas*) and Critically Endangered hawksbill turtle (*Eretmochelys imbricata*) nests on all of the islands within the area, with higher proportion of green turtles nesting activity observed compared to Hawksbill turtle nesting. This trend reverses in the Amirantes and in the Seychelles Inner islands where there are higher number of Hawksbill turtle nesting compared to Green turtles. The nesting population of green turtles (*Chelonia mydas*) in the Area is the largest in Seychelles after Aldabra's. The lagoon and reef provide foraging habitat for juvenile turtles originating in protected rookeries throughout the western Indian Ocean.

The Area has been identified as a blue whale breeding area and as a historical humpback whale breeding area. The area also has regular sightings of a number of whale species including the sperm whale (Physeter macrocephalus), orcas (*Orcinus orca*), as well as the Short-finned pilot whales (*Globicephala macrorhynchus*) and mellon headed whales (*Peponocephala electra*).

Cosmoledo holds the Seychelles' largest colony of sooty terns at over 1.2 million pairs, globally significant colonies of masked booby (W. Indian Ocean race) and red-footed booby (race rubripes). Brown boobies, greater frigatebirds, red-tailed tropicbirds, fairy, greater crested and black-naped terns and brown noddy terns also breed, and white-tailed tropicbird, Caspian and bridled terns are thought to do so. There are also endemic races of land birds, Souimanga sunbird (race buchenorum) is confined to Cosmoledo and Astove, and the Madagascar white-eye is restricted to Menai island (BirdLife International 2019).

Although shark numbers have been greatly reduced by overfishing, tiger, lemon, bull and hammerhead sharks have been seen in recent years. Large and iconic fishes are also present. Cosmoledo has two known spawning aggregation sites for Vyey Goni (brown marbled grouper), Vyey Masata (camouflage grouper) and Vyey Babonn (marbled coral grouper), and four known multispecies fish spawning areas. At least one spawning site for groupers (Serranidae) is suspected in Astove, and there are likely other sites.

5.3.3 Social and cultural (including recreation)

The main existing use of the Area is tourism (recreation) but as an economic activity, is described in Section 5.7. There are some sites of cultural importance, namely the Norwegian cemetery on the north west side of Menai Island (Cosmoledo atoll), and shipwrecks. No evidence of indigenous settlements or artefacts prior to the 1800s has been recorded.

The Area's remoteness limits purely recreational visitation although the area is visited by yachts. The islands and atolls of the Cosmoledo and Astove Archipelago Sustainable Use Area also provide important anchorages for artisanal fishing and charter vessels visiting the Outer Islands (ICS & IDC 2018, Government of Seychelles 2019a).

5.3.4 Economic

Seychelles has a high-income economy with one of the highest GDP per capita in Africa (World Bank[7]), founded on two marine sectors – fishing and tourism – both of which are important in the Outer Islands, including in the Cosmoledo and Astove Area.

Marine and coastal biodiversity has been fundamental to the socio-economic development of the Seychelles since human colonization in the late 18th century (Government of Seychelles, 2014). To date, tourism and fisheries remain the two main pillars of the economy. As far back as 1969, the Government of Seychelles recognises through the Tourism policy of 1969 that *'the attractions that tourists will seek, and above all to protect the natural beauty of these islands, which from all points of view, including tourism, is probably our greatest asset'.*

Tourism contributed 39.2% of total GDP in the Seychelles in 2019 and 21.9% in 2020 despite the global pandemic (WTTC 2021[8]) and is expected to be a key driver of post-pandemic recovery and to contribute 48% to GDP by 2028. These national trends are expected to be reflected in the Outer Islands and atolls that support nature-based tourism and recreation including marine charters, SCUBA diving, snorkelling, sport fishing, wildlife watching, cruise passenger ships, and other forms of recreation, which are important economic activities.

The Cosmoledo and Astove Area is important economically. The main existing economic use of the area is tourism including sport fishing and high-value reef fly fishing in the shallow atoll lagoons. Species targeted in the Cosmoledo and Astove Area include bonefish (*Albula vulpes*), giant trevally (*Caranx ignobilis*), milkfish (*Chanos chanos*), triggerfish (*Balistoides spp.*) and permit (*Trachinotus blochii*). It has been reported that guests pay as high as USD 14,000 per week to flyfish in the area due to its exclusivity, pristineness, and high population of some of the most sought-after fly-fishing target species. A recent assessment of the economic and social importance of the Seychelles' sport and recreational fishery indicated that an average of USD 9.6 million is spent annually in the outer islands' recreational fishery, for which the Cosmoledo and Astove Area is one of the key sites.

The tourist season is normally mid-October to end of April when seas are relatively calm, but numbers are restricted by Cosmoledo's remoteness. Liveaboard vessels provide a steady presence during the season, carrying up to 20 guests. The main attraction is reef fly-fishing, particularly on the lagoon flats which began in 1997/1998 but halted in 2009 due to threats from Somali pirates. The industry has recovered since 2014.

Despite its remoteness, a small number of semi-industrial and artisanal fishing vessels sometimes fish within the Cosmoledo and Astove Sustainable Use Area. Artisanal fishing vessels going this far south are schooners that target snappers, emperors, and groupers. Semi-industrial vessels target tuna and tuna-like species using pelagic longlines, and those operating in the sea cucumber fishery target sea cucumbers on reefs and shallow banks.

Other economic activities include sport-fishing, tourism (yacht charters, diving), and the Area is an internationally recognised sport-fishing destination.

[7] https://www.worldbank.org/en/country/seychelles/overview
[8] https://www.statista.com/statistics/1256977/contribution-of-travel-and-tourism-to-gdp-in-seychelles/

5.3.5 Research and education

Research provides key information on the values of the Cosmoledo and Astove Archipelago, an improved understanding of what is 'natural' as a benchmark for monitoring programs, and facilitates a better understanding of the short and long-term impacts of human activities.

The value of research and education is that it can improve understanding of and appreciation of the Area, and therefore respect for the management strategies and actions. The Islands Conservation Society (ICS) has a long-term research presence in the area monitoring seabirds and turtles, fishes, reefs, and also human uses such as subsistence fishing for island inhabitants. The ICS opened a conservation centre on Astove in early 2023. The commercial fly fishing tourism company also collects data on fly fishing catches.

While the remoteness of the Cosmoledo and Astove Archipelago is a barrier to research activity. notable research expeditions have been made over time including Moresby 1822; Wharton 1878 (hydrographic); Baty 1895 (agricultural); Bergne 1901; Dupont (plants, insects) 1906; Thomasset (insects) 1907; Fryer (general & insects), Percy Sladen Trust Expedition 1908; Vesey-Fitzgerald (birds, vegetation) 1937; Prola, Palombelli et al Italian Zoological expedition 1953; Legrand (Lepidoptera) 1956; Baker & Piggott (geology, soils) 1960; Honegger (birds, reptiles) 1964; Bourne, HMS Owen (birds) 1964; Gwynne, Wood & Parker (plants, birds) 1967; Benson, Diamond, Frazier, Fosberg, Renvoize, Grubb et al, Royal Society March 1968; Bayne, Gamble, Poore, Stoddart & Westoll, Royal Society Sept 1968; Mortimer (turtles) 1981, 1982; Skerrett (birds) 1996; Feare, Rocamora, Skerrett (birds) 1999; Rocamora (birds) 2001; Obura, Rocamora, Matyot, Mortimer et al CORDIO (corals, birds, turtles, insects, vegetation) 2002; Aldabra Marine Programme (fish) 2004; Robinson et al, SFA (fisheries) 2004; Gerlach, Indian Ocean Biodiversity Assessment 2005; Adam, Rocamora, Labiche et al (rat eradication) 2007; Matyot, Rocamora, Mortimer, Bijoux et al, (birds, turtles, insects, vegetation, rat survey) 2008; Adam, Downer, Mortimer, Rocamora, Fay et al, Pangaea (vegetation, turtles, seabirds, reef) March 2014; Martin & Pinchart ICS (vegetation mapping, insects, seabirds, cat survey) Nov-Dec 2014; Fay et al Pristine Seas, National Geographic, March 2015.

6. Current Uses

The Cosmoledo and Astove Archipelago Sustainable Use Area is being used for multiple economic activities such semi-industrial, artisanal, and recreational fishing that makes use of different types of fishing gears including pelagic longlines, droplines, hand gathering, handlines, and rods which use a variety of tackles and lures. Tourism activities are also popular and include activities such as nature excursions, snorkelling and SCUBA diving. The different current uses of the area are provided below.

6.1 Commercial Fisheries

Industrial fishing (vessels over 24 meters length) does not occur in the Cosmoledo and Astove Archipelago Sustainable Use Area as all industrial fishing vessels are excluded from this area as per Regulation 5a of the Fisheries Regulations (2012; Cap 82). However, semi-industrial and artisanal fisheries are allowed. Three types of ***semi-industrial fisheries*** operate in the Cosmoledo and Astove Sustainable Use Area. These include the semi-industrial longline fishery, dropline fishery, and sea cucumber fishery. Vessels operating in these fisheries are owned by Seychellois, but the work force is mainly foreigners (from Sri Lanka longline fishery and from Madagascar for sea cucumber fishery). Due to the long distance from the Inner islands, much lower level of semi-

industrial fishing activities take place in this Area compared to the Amirantes to Fortune Bank Sustainable Use Area.

The ***semi-industrial longline fishery***, targets tuna and tuna-like species. Increasingly, vessels in the fishery are making use of the southern part of the Seychelles EEZ in search of better catch. In 2021, there were 41 licensed semi-industrial vessels in operations, which took a catch of 1,758 Mt within the Seychelles EEZ that was mainly dominated by yellowfin tuna (89%) and swordfish (6%). It is currently not known what percentage of semi-industrial longline fishing trips come to the Area and the contribution of the Area to the total catch. The semi-industrial longline fishery continues to expand in terms of the number of vessels and the area that is fished. Most of the catch from this fishery is exported as fresh tuna on ice.

The ***dropline fishery***, targets deepwater fishes along the edge of plateau and banks. They target species such as the Crimson jobfish (*Pristipomoides filamentosus*), Deep-water red snapper *(Etelis carbunculus*), other snappers and groupers. Though permissible in the Area, it is unclear how often such type of fishery is undertaken and what contribution they make to total catch. Catch from the dropline fishery supplies both local and export markets.

The ***sea cucumber fishery*** is a closed fishery with 25 non-transferable fishing licenses. The fishery is open annually between 15th September and 15th June. Effort restrictions apply with each vessel allowed up to four divers and one apprentice. Licensed vessels collect sea cucumbers on reefs and shallow banks throughout the Seychelles EEZ including in the Cosmoledo and Astove Archipelago. According to management measures in place, fishers must request permission from the SFA to collect sea cucumbers in areas south of the Amirantes. The total catch in 2021 was 334,904 pieces from the three species allowed to be retained. It is unclear what percentage of the annual catch usually comes from the Cosmoledo and Astove Sustainable Use Area. Most of the catch from this fishery is dried and exported to Southeast Asia. In 2021, SCR 92 million of dried sea cucumbers were exported.

Artisanal fishing in this area is undertaken by schooners from the Inner islands. The fishery targets mostly demersal species. Few artisanal fishing trips are made to the area due to long distance and associated costs and reported loss in quality and value of fish kept on ice for extended periods. Vessels that fish in this area are often attracted by large numbers and size of the various groupers, snappers and emperors that are caught.

Subsistence fishing continues as a means to support inhabitants (workers and guests) on the islands. The area is not currently being used for any type of **mariculture**- related activities.

Illegal fishing takes place for reef fish and sea cucumbers, largely by foreign vessels. Although successful prosecutions and confiscations have taken place, the scale of the problem is unclear due to the remoteness of the Area, with most reports of illegal fishing coming from the Seychelles fishing fleet. The Outer Islands have long been subjected to poaching of seabird eggs, marine turtles, and dolphins. Despite being illegal, Seychellois and foreign fishing vessels still take marine turtles to supplement diet and income (ICS & IDC 2018).

6.2 Maritime Infrastructure (and use)

The Cosmoledo and Astove Archipelago Sustainable Use Area has very little maritime infrastructure. None of the islands within this area have a jetty, and goods delivered to the islands within the area are delivered using shallow hull beach craft that are beached on the islands. A radar station exists on Astove to monitor vessel traffic and support surveillance and enforcement, although it is currently not operational.

6.3 Tourism & Recreation

Tourism and recreation, including sportfishing, are recognised activities throughout the Cosmoledo and Astove Archipelago Sustainable Use Area. Sport fishing, especially reef fly-fishing, has been the mainstay of Cosmoledo's tourism for some years. Blue Safari Seychelles has established lodging and operations on Astove Island and Cosmoledo (Wizard/Grande Ile Island) and actively promote sustainable fishing practices. The liveaboard vessels *Maya's Dugong* (Silhouette Cruises), *Kir Royale* and *Pangaea* are regular visiting vessels, usually collecting guests at Assumption for the 12-14hour crossing. IDC has rebuilt accommodation and infrastructure and refurbished the airstrip on Astove, which opened for business in February 2015 with Blue Safari Seychelles fishing guides, hosting up to 6 shore-based guests.

Private yachts, white boats, and occasionally cruise ships, also visit the Area, and concerns have been raised that visitation pressure from these sectors is growing.

6.4 Non-renewable/resource extraction

There are currently no petrochemical or mining exploration licenses active in the Area. Several statutory mechanisms are in place to minimise impacts from oil and gas surveys or extraction, if such activities are licensed in the future, including vessels not operating within 5 km of the coast, protocols to minimise disturbance to marine species (e.g. marine mammals), full Environmental and Social Impact Assessments (ESIA) before an exploration permit will be granted, and an oil spill contingency plan approved by government (UNDP 2012).

6.5 Research and education

Research and education are priorities for this Area. However, the remoteness of the Area and associated high costs, as well as restrictions on permissions and access and funding, limit research activities. Much of the active and ongoing research is conducted by the Island Conservation Society (ICS) that has staff working alongside the IDC and Blue Safari operations. Either independently or in collaboration with other research institutions, ICS research programs at Cosmoledo and Astove have included seabird and turtle monitoring, coral reef monitoring, tagging and post-release survival or fishes caught during fly fishing, tagging and tracking marine species such as fishes and manta rays, and monitoring of artisanal catches. The ICS opened a conservation centre on Astove in early 2023 to support ongoing research and conservation efforts.

7. Implementation and Governance

Effective implementation of this Management Plan will require a single coordinating agency to enable monitoring and evaluation, adaptive management, efficient stakeholder engagement and inter-agency coordination.

The Seychelles Oceans Authority Bill (SOA Bill) sets out the mandate of the Seychelles Ocean Authority (SOA) as an independent, coordinating and strategic management body that is responsible for managing the Areas designated through the SMSP process and to deliver on the overarching SMSP objectives. The key functions of the SOA are review and adaptive management functions, coordination, engagement, and developing relevant policy (see Appendix D). In general, the SOA will have the mandate for the overall SMSP and is empowered to require implementing agencies to report on the implementation on a regular schedule and in a standardised format, for example, agencies such as the Seychelles Coast Guard. The SOA will also

provide oversight and expertise in matters of marine governance (e.g. Areas Beyond National Jurisdiction, EEZ boundaries, the Joint Management Area with Madagascar, Port State Measures Agreement, designation of Particularly Sensitive Sea Areas, Oceanographic research and application of the Maritime Zones Act).

The SOA is not an implementing entity and direct 'on ground' implementation of management plans and policy will be undertaken by delegated authorities that manage sectors or areas within the SMSP. Co-management arrangements will enable this function with a range of delegated authorities, for example, the Seychelles Coast Guard, Seychelles National Parks Authority, Seychelles Fishing Authority, Islands Development Company, Seychelles Island Foundation, Island Conservation Society, Nature Seychelles and others, including the private sector, which may assume specific co-management roles.

The SOA will be empowered under the Seychelles Ocean Authority Act to coordinate and oversee adaptive management of the Seychelles Marine Spatial Plan. Presently, the SOA Bill is drafted and needs approval from Cabinet and the National Assembly.

The Seychelles Ocean Agency has been established as an interim agency to progress the SMSP and prepare for the independent SOA.

7.1 Implementation barriers

In addition, there are potential barriers that have been identified as part of the issues prioritisation process with stakeholders that could compromise effective implementation of the Management Plan. These are listed below and linked to priorities issues from Section 5.3.

Accessibility

The Cosmoledo and Astove Archipelagos remoteness poses a logistical challenge to its effective management. Supplies and equipment need to be transported long distances and access by managers and delegated authorities for monitoring, compliance and enforcement also faces similar challenges.

Stakeholder stewardship

Management experiences in other marine protected areas in the Seychelles have proven the importance of engaged stakeholders familiar with the values of the Area and the role they play in the condition of the ecosystem. The Management Plan strives to develop an engaged public constituency through transparent decision making, equitable access and directly engaging them in issues and concerns involving the Area. However, there are limited opportunity to enable local stakeholders to experience the Area, limiting their appreciation and sense of ownership.

Funding and other resources

Effective implementation requires adequate financial and human resources to maintain management. It is proposed that permit fees paid by commercial users (e.g. tourism operators) will be one of the sources of income to support management of the Area.

Awareness and education

Management experiences in other marine protected areas in the Seychelles have proven the importance of aware stakeholders and users familiar with the values and regulations in the Area and their responsibilities. The Management Plan strives to develop an informed public constituency. However, there are limited opportunity to enable local stakeholders to experience the Area, limiting their appreciation and sense of ownership.

7.2 Implementation and governance considerations

Implementation of this Management Plan and ongoing governance recognizes that there are established systems and frameworks in the Seychelles for many of the functions that will be required. ***Existing agreements and instruments*** remain in place for Cosmoledo and Astove Archipelago until SMSP regulations, governance structures and committees, and a national permits system is established. These existing agreements and their management strategies have been considered in the development of this Management Plan and the strategies align with the management and conservation intent of these instruments.

A co-management approach is essential to effectively implement this Management Plan, and will include relevant agencies to implement through the delegated authorities group, nominally ***a multi-sectoral representative management committee*** and an independent Complaints and Resolution body, both assembled by the Seychelles Oceans Authority (SOA). The establishment of the independent SOA is key to implementation and ongoing governance of the SMSP.

The management actions outlined in Section 4 identify that all commercial activities should be managed under a ***transparent and equitable national permit system***. As such, the protected area permit system will need to consider these activities and align with the line agencies issuing permits for these activities (e.g. SBS, SMSA, PetroSeychelles). For example, there is an established system under the SFA for issuing fishing licenses, and rather than having two permit/license systems that increase the bureaucracy for stakeholders, the intent is to design the protected area permit system to incorporate existing systems. Some adjustments may be required to existing systems to account for Sustainable Use objectives and spatial requirements, however, a streamlined single process for applicants is recommended.

The foundation of the design is based on providing a framework for existing license/permit systems that explicitly considers the Sustainable Use (Zone 2) goals and objectives and the allowable activities conditions through a spatial lens. It aims to avoid duplication and deliver a One-Stop-Shop for applicants. Individual agencies remain responsible for assessing permits for their areas of jurisdiction, however, the initial permit application screening and issuing of permits would be administered by a multi-sectoral representative committee assembled by the Seychelles Oceans Authority (SOA). This would ensure that all permit applications are assessed against Sustainable Use (Zone 2) goals and objectives, any permits issued incorporate allowable activities conditions, and permits have a spatial endorsement for activities.

This Management Plan recognises that sustainable fishing is essential to meet the goal and objectives of sustainable use (Zone 2) areas, but acknowledge that fisheries management is primarily the responsibility of the Seychelles Fishing Authority (SFA), with management implemented through Fisheries Regulations, license conditions and fisheries management plans. However, currently there are no fisheries management plans that apply to the Outer Islands, or management plans to address sport fishing and fly fishing. In order to address the issues raised and solutions proposed by stakeholders during the consultative process, ***interim fisheries actions*** have been included that are temporary until such time as fisheries management arrangements are finalised. It is intended that these interim strategies will be reviewed, and responsibility transferred to the management committees responsible for overseeing the implementation of specific fisheries management plans as and when these are developed and come into force.

7.3 Reporting requirements

Seychelles Government agencies responsible for environmental management required to produce annual reports of their activities and reporting requirements are included in the draft

legislation for the SOA. This requirement would be met through the reporting framework developed for the Performance Measurement Framework (section 8.2). In addition, it is recommended that every five years implementation progress and effectiveness of this Management Plan be reported for all Sustainable Use Areas that synthesises the management efforts throughout the region, the status and trends in ecological, social, cultural, and economic values, progress towards achieving management objectives, and future challenges and threats.

8. Performance Measurement Framework

The Performance Measurement Framework (PMF) has been designed to measure performance against the Cosmoledo and Astove Archipelago Sustainable Use Area Management Plan objectives. The Performance Measurement Framework (PMF) will provide managers and decision makers with a systematic process to measure and report on Management Plan progress towards achieving the Goal and Objectives. Importantly, the PMF provides transparency by measuring and publicly reporting on the performance of the Management Plan in ensuring the long-term sustainability of Cosmoledo and Astove Archipelago, which is a community owned resource. The PMF includes indicators to measuring progress of both *management actions* and *key results,* and trigger levels and decision rules that provide guidance about limits of acceptable change, and the actions to be taken when changes exceeding these limits are detected. The PMF will provide a measure of protected area management effectiveness.

Indicators

An indicator is a quantifiable measure that is used to track progress toward an intended result. In the case of this Management Plan, the indicators selected followed the principles of SMART indicators (Specific, Measurable, Achievable, Relevant, Timebound) to ensure that they are useful in measuring Management Plan performance, and can detect trends in both implementation (*actions*) and changes in the system (*key results*). Collectively, the indicators create an analytical basis for decision-making and help focus on measures that matter most in meeting the management objectives.

Trigger Levels and decision rules

Trigger level define the value of the performance indicator that relates to some pre-agreed threshold or *limit of acceptable change*. A trigger level represents an undesirable point or state and represents the point at which a management response should occur. The PMF defines trigger levels for each performance indicator selected for the Cosmoledo and Astove Sustainable Use Area Management Plan. Once a trigger level is exceeded, a predefined *Decision Rule* provides guidance about the required management action.

8.1 Developing the Performance Measurement Framework

In developing the PMF, consideration was given to the management goal and objectives, the priority issues identified for the Area, and the strategies identified to address these issues (see Figure 5). A Technical Working Group was formed to provide guidance about selecting the best indicators, data availability, and trigger levels. When selecting indicators, key factors considered included data availability, simplicity and practicality, and the resources available to analyse and publicly report outcomes. An extensive list of indicators has been developed (an indicator 'bank'), but not all indicators are intended to be implemented immediately. Some indicators can be adopted and monitored within one year of the Management Plan commencing (Phase 1 indicators). These are mostly 'action' indicators that measure what management has been implemented. Meanwhile, other indicators should be adopted and implemented within 5 years

(Phase 2 indicators), and within ten years (Phase 3 indicators). These Phase 2 and Phase 3 indicators are mostly 'key results' indicators, which measure changes in the system that may require longer time scales for results to become apparent. Importantly, these indicators also tend to be more costly and complex, and thus a longer period is required to establish programs to monitor them.

The process used to develop and apply the PMF for the Cosmoledo and Astove Archipelago Sustainable Use Area Management Plan is outlined in Figure 5, and the details of the indicators are provided in Appendix E.

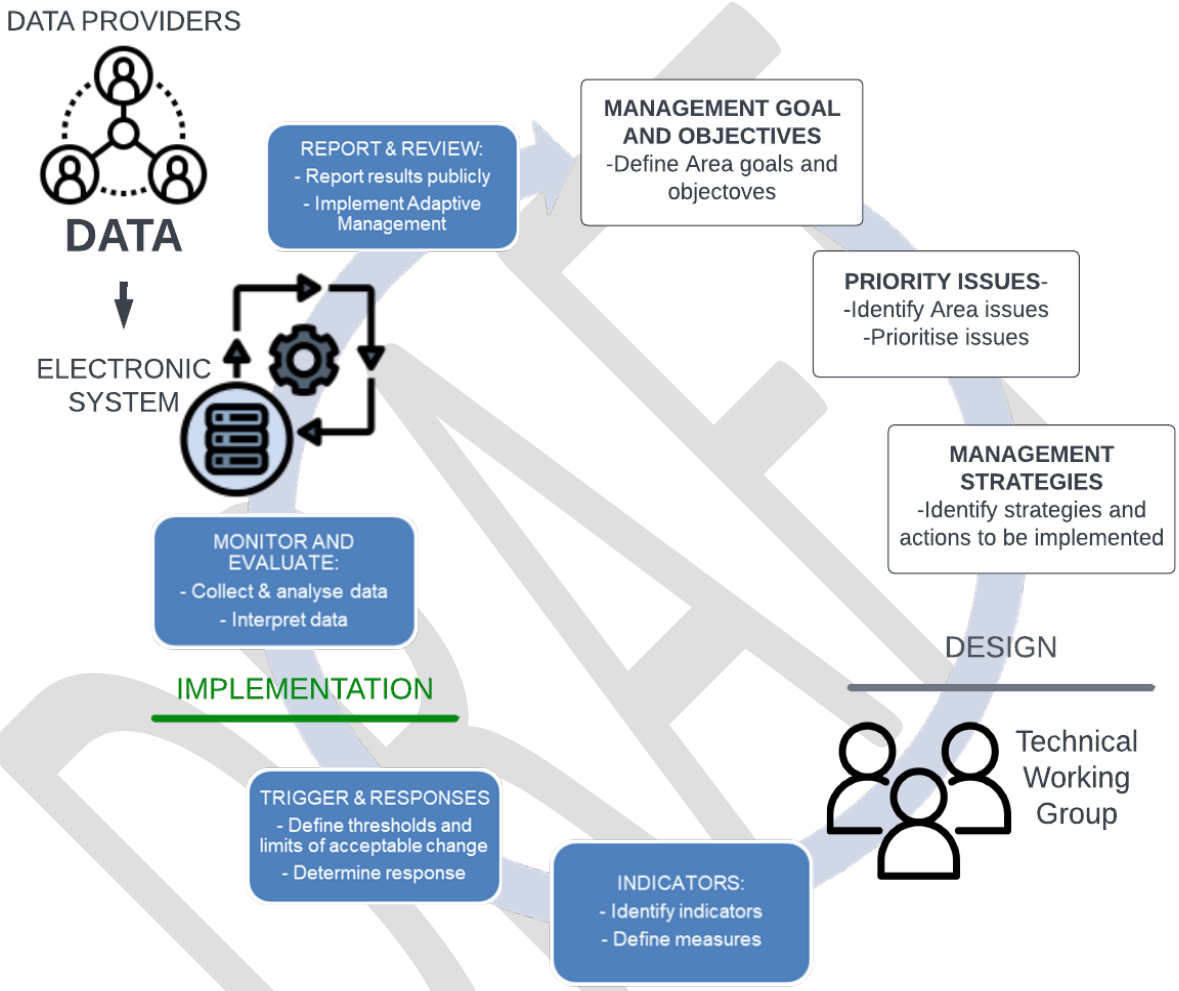


Figure 5. Process for developing the Cosmoledo and Astove Archipelago Sustainable Use Area PMF and applying the system.

8.2 Key indicators and reporting frameworks

The Cosmoledo and Astove Archipelago has indictors across the ecological, social and cultural, economic, and governance dimensions of the Management Plan. Indicators are grouped into different Phases, with Phase 1 indicators being those that can be implemented immediately, and Phase 2 and Phase 3 indicators should be activated over the next 5–10 years.

Trends and patterns in relevant indicators shall be reported on in annual reports by the Seychelles Ocean Authority, and in a five yearly synthesis report about the status and trends across all Sustainable Use Areas. Annual reports should focus on the *action* indicators that describe the

implementation of management activities, while five-year synthesis reports should describe trends and patterns of both action and key results indicators. For both annual and five-yearly reports, any exceedances of trigger levels will be clearly identified and a response to address the exceedance clearly documented.

The annual and five yearly reporting schedule provides transparency about Management Plan implementation by publicly reporting on management actions being implemented and the state of the Area. Additionally, by including clear trigger levels and decision rules, the PMF provides transparency about the expected actions and outcomes that should occur through this Management Plan, and the corrective actions to be taken if these expectations are not achieved.

9. Compliance and Enforcement

Compliance and enforcement are essential components of effective management. These components help to ensure that the agreed upon rules and regulations about managing a shared resource are adhered to by all recourse users. Without adequate compliance and enforcement, adherence to agreed rules may rapidly deteriorate (Ostrom 2008). Fisheries management plans are often complemented by Monitoring, Control, and Surveillance (MCS) programs that help to ensure fishers comply with fishing regulations. Spatial management plans, however, tend to include a much broader suite of activities and user groups, and thus commonly have Compliance and Enforcement Plans that accommodate a broader spectrum of user groups, uses, and risks[9]. To ensure the effectiveness of this Management Plan, there needs to be an adequate compliance and enforcement effort. Compliance and enforcement are two separate processes that work in combination to ensure that resource users follow the rules.

Compliance activities are actions that assist or induce users of a shared resource to comply with the rules about how the shared resource can be accessed and/or used. These actions can include education programs to ensure people know what the rules and requirements are, programs and initiatives that help people follow the rules (e.g. marking special areas on digital charts; creating knowledge networks to share information about rule changes or demonstrate that people breaking the rules have been appropriately penalized), or management systems such as permit systems that provide access privileges that are conditional upon certain standards and behaviours, and where non-compliance can result in the loss of these privileges.

Enforcement activities are actions to detect, apprehend, and sanction users who are breaking the rules. Enforcement activities align with fisheries MCS systems in that they monitor use of the resource, exert control over use by deterring non-compliance, and conduct surveillance to detect illegal activities. However, enforcement is a broader concept than just fisheries monitoring, control and surveillance as it needs to cover all the different users of the shared resource and linked systems (for example Environmental Impact Management Plans for marine infrastructure), and may even extend to working with the judiciary in prosecuting offenders.

These two components work together to ensure that users follow the agreed rules as shown in the Compliance pyramid (Figure 6). The Pyramid shows that resource users can have a range of attitudes towards compliance. Typically, most users are willing to comply, indicated by the broad base of the pyramid. To ensure that resource users do the 'right thing', authorities should focus

[9] For example, the Tubbataha Reefs World Heritage Area Compliance and Enforcement Plan (www.tubbatahareefs.org)

on helping these users to comply with the rules (education, support, and monitoring). Where users are non-compliant, regulatory responses should escalate with prosecution and legal proceedings implemented for repeat offenders, high-impact breaches, or where mandated by law. An effective compliance and enforcement plan ensures that all users are aware of the rules and regulations, are supported and even rewarded for complying with the rules, and where non-compliance is quickly detected and acted upon to ensure offenders change their behaviour. Prompt corrective action also acts as a deterrent for others considering non-compliance. As enforcement efforts and legal prosecutions are very costly, it is preferable to ensure that the vast majority of users comply with the rules and regulations which further highlights the importance of compliance activities.

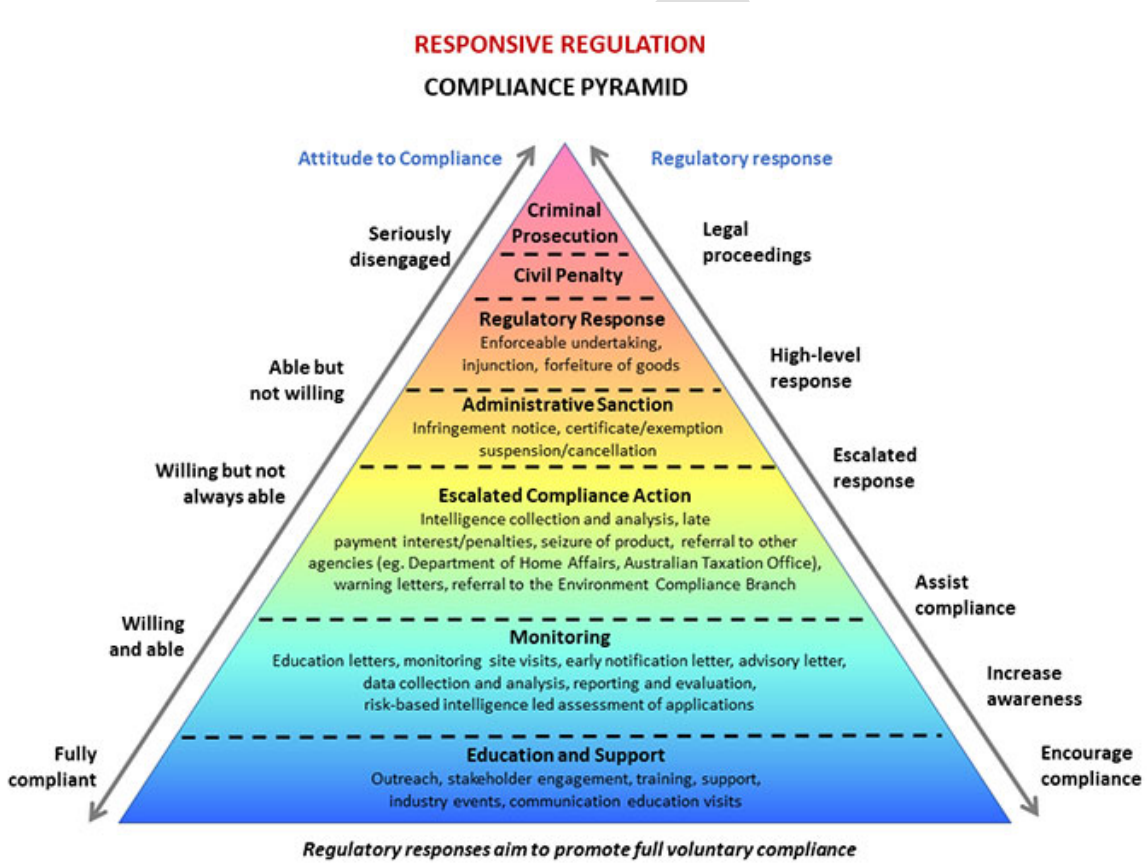


Figure 6. Compliance pyramid showing the range of potential user attitudes towards rules and regulations, the recommended management response, and the range of regulatory enforcement responses to drive compliance. Source: Australian Government Department of Climate Change, the Environment and Water (2023).

Compliance and enforcement are complex tasks that require strategic coordination across all delegated authorities responsible for implementing this Management Plan. This Management Plan includes numerous actions to facilitate an effective compliance and enforcement program. Strategy 4 of the Management Plan includes actions to establish governance arrangements that would support inter-agency and stakeholder coordination and reporting. Strategy 6 of this Management Plan contains specific actions to develop and implement a risk-based compliance and enforcement plan, as well as exploring monitoring and surveillance technologies to monitor usage patterns and user compliance. Strategy 7 includes an action to help users understand the values of the area and the rules that apply to use and. Implementing the PMF will document what management actions have been implemented and the results of these actions.

9.1 Monitoring and surveillance

Monitoring and surveillance are crucial elements of enforcement, but can be very challenging to implement across large areas of ocean. A scoping study has been completed to explore the options available for monitoring and surveillance of the Sustainable Use 'Zone 2' Areas such as the Cosmoledo and Astove Archipelago. These areas are vast areas of open ocean that present significant challenges to traditional monitoring and surveillance platforms such as patrol vessels and aircraft. Alternatively, remote platforms such as satellites provide a more cost-effective means for monitoring and surveillance over these large areas. Numerous satellites platforms are available (each with unique benefits and drawbacks), but satellites are capable of generating a lot of data on the way an area is being used, and about compliance/non-compliance patterns. Advances in machine learning and artificial intelligence (AI) can significantly improve data processing, for example, analysing vessel movements against known 'signatures' to automatically code a vessels' activity and assess its compliance. Importantly, while satellites can provide non-stop surveillance, they cannot be detected from the surface and thus vessel crews may need to assume they are always under surveillance, providing a potential deterrent effect. Meanwhile, unmanned aerial vehicles (UAVs) and radar systems may also be effective for shorter range, targeted monitoring and surveillance. While detection range remains a limiting factor for these technologies, advances in design (especially for UAVs) warrant further investigation, and these platforms could be effective assets in targeted shorter-range roles (e.g. scouting for a patrol vessel, collecting video evidence to support a prosecution).

Meanwhile, the Seychelles Government already has legislation and systems in place, for example the Vessel Monitoring System for fishing vessels; and the National Information Sharing and Coordination Centre, that provide a firm foundation for developing an effective compliance and enforcement programme for the Sustainable Use Areas. The scoping study recommends a dedicated effort to combine and integrate multiple data streams including satellites, sensors, and AI, through the NISCC to monitor usage patterns for a year to conduct a strategic threat analysis and understand current use patterns and signatures. Further exploration of targeted surveillance platforms such as UAVs is also recommended.

Nevertheless, monitoring and surveillance need to be integrated into an overall compliance and enforcement plan so that once illegal activity is detected, an enforcement response can be implemented to intercept and cease the illegal activity, and that sufficient sanctions and penalties are imposed by the judicial system to provide a deterrent to subsequent non-compliance.

10. Management Plan Review Process

This Management Plan identifies strategies and actions over a five-year period from 2024–2028. This is a living Management Plan with proposed annual progress reviews of implementation of strategies and actions coinciding with budgeting the following year. The annual review will identify issues affecting implementation, resourcing and expenditure, emerging threats and issues of concern, and exceedance of trigger levels arising from the PMF indicators (see Section 8). This will inform adaptive and responsive management. Annual work and monitoring plans will be prepared by the delegated authorities and budgeted as noted above.

This 5-year Management Plan will be reviewed at the halfway point (mid 2026) and evaluated and updated at the end of the 5-year period (2028). This 2028 five-year review will include feedback to stakeholders and consultation with stakeholders regarding Management Plan implementation. Status of the key performance measurement indicators for the Area and efficacy of management strategies will be reviewed and assessed as part of the 5-year evaluation.

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Appendix A: International obligations

International obligations relevant to management and conservation of ocean resources

As a signatory to various international conventions, the Seychelles is committed to sustainably managing their marine and coastal ecosystems, including protecting 30% of their marine EEZ. The most relevant international obligations include:

- The 1994 ***UN Convention on the Law of the Sea*** (UNCLOS) which aims to regulate all marine activities in any area of the sea and "provides legal basis upon which to pursue the protection and sustainable development of the marine environment and its coastal resources". Signatories to the convention are obligated to conserve and manage the living marine resources under their jurisdiction.
- Convention of Wetlands of International Importance, Especially as Waterfowl Habitat (***Ramsar Convention***) of 1971 aims to stem the loss of wetlands worldwide especially those that are important for migratory waterfowl. It defines wetlands as fresh, brackish, and saltwater marshes, including marine waters up to 6 meters in depth at low tide and any deeper marine waters contained within the wetland area. The Seychelles became a signatory to the Convention on Wetlands (RAMSAR) in March 2005. The first Ramsar site to be designated in Seychelles was the Port Launay Mangrove on Mahé in November 2004, and there are two other Ramsar site – Aldabra and Mare Aux Cochons on Mahé.
- Seychelles was the second country to sign the ***Convention on Biological Diversity*** (CBD) in June 1992 and became a party that same year. One of the CBD Aichi targets is "10% of coastal and marine areas are effectively conserved by 2020" (Strategic Goal C, target 11). It provides for the establishment of protected areas where special measures are to be taken to conserve biological diversity and the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings.
- Seychelles is a signatory to the ***United Nations 2030 Agenda for Sustainable Development*** founded on 17 Sustainable Development Goals (SDGs). The SDGs (or Global Goals for Sustainable Development) are a collection of 17 goals set by the United Nations in 2015. The goals are broad and interdependent, yet each has a separate list of 169 targets to achieve. The SDGs of relevance include SDG12 Responsible Consumption and Production, SDG13 Climate Action, and SDG14 Life Below Water. SDG14 has a target of 10% marine and coastal protection by 2020.
- Seychelles was the first country in the Western Indian Ocean to declare commitment to a Blue Economy with the signing of the ***Abu Dhabi Declaration*** (January 2014).
- FAO Agreement on Port State Measures (PSMA) (2016), first binding international agreement to specifically target illegal, unreported and unregulated (IUU) fishing. Its objective is to prevent, deter and eliminate IUU fishing by preventing vessels engaged in IUU fishing from using ports and landing their catches.

Appendix B: Draft Allowable Activities, codes and definitions

The 'Master List of Uses and Activities' is a list of uses, activities and terms with their descriptions in support of the Seychelles Marine Spatial Plan as it pertains to Allowable Activities tables, Management Considerations, and other outputs of the SMSP. The list and definitions began in 2014 with the launch of the SMSP and have been updated on an on-going basis as other SMSP outputs were developed and revised. The list of definitions has been developed with all stakeholders including SMSP committees, technical working groups and topic experts. The descriptions are not intended to define thresholds or acceptable intensity of use because this varies from place to place and is, or may be, determined by management plans and/or regulations. Wherever possible, a published or authoritative description or definition is used; those without a source are a local or general description of the use or activity.

Table A1. SMSP Zoning Design DRAFT Allowable Activities Table: Sustainable Use (Zone 2) areas. Legend: A – Allowable; C – Conditional; X – Prohibited. See Code Table A2 for superscript numbers.

Sectors	Marine Activity	Zone 2 *Nov 2022*	Notes
Fisheries	*Aquaculture*	C [1,5]	
	Aquaculture Coral Farming	C [1,5]	
	Artisanal Fishing (multiple gear types)	C [1,5]	
	Fly Fishing, blue water	C [1,5,7,12]	
	Fly Fishing, lagoon	C [1,5,7,12]	
	Industrial Pelagic Longline	C [1,5,13,17]	
	Industrial Purse Seine (free school)	C [1,5,13,17]	
	Industrial Purse Seine (floating objects, DFAD)	C [1,5,13,17]	
	Industrial Purse Seine (supply vessel)	C [1,5,13,14,17]	
	Recreational Fishing	C [1,5]	
	Semi-industrial Hand Gathering	C [1,5,17]	
	Semi-industrial Hook & Line	C [1,5,17]	
	Semi-industrial Longline	C [1,5,17]	
	Sport Fishing (multiple activities)	C [1,5,7,12]	
	Subsistence Fishing	C [1,2,5]	
Maritime Infrastructure	*Ballast and Bilge Dumping*	X	
	Bunkering at sea	C	
	Bunkering at sea, Fishing vessel	X	
	Commercial shipping	C [5,8]	
	Desalination, boat-based	A	
	Desalination, land-based	C [1,3,5]	
	Disposal, dumping, dredge spoils	X	
	Dredging, coastal	C [1,3,5,19]	
	Ferries and Transportation	C [2,19]	
	Patrols and Surveillance	A[15]	
	Ports, Marinas, Wharves, Jetties	C [1,3,5,19]	
	Reclamation	X	
	Renewable Energy, deep water thermal	X	
	Renewable Energy, solar (marine)	X	
	Renewable Energy, tidal	C [1,3,5,19]	
	Renewable Energy, wind (offshore)	C [1,3,5,19]	
	Renewable Energy, wave	C [1,3,5,19]	
	Underwater Cables	C [1,3,5]	
Non-renewable & prospecting	*Bioprospecting Development*	C [1,3,5]	
	Deep-sea Mining	X	
	Petroleum Geophysical Surveys, Exploration	C [1,3,5,8,10]	
	Petroleum Exploration, Drilling	C [1,3,5,8,10]	
	Petroleum Development, Production, Extraction	C [1,3,5,8,10]	
	Sand Mining	X	
Tour	*Anchorages and Mooring Buoys*	C [1,2,4,5,19]	

Sectors	Marine Activity	Zone 2 *Nov 2022*	Notes
	Floating structures	C [1,3,4,5]	
	Hire craft	C [1,5,16,20]	
	Motorised Activities (Watercraft, Ship)	C [1,5,11,16,20]	*OIP jet skis - X*
	Non-Motorised Activities	C [1,5,19]	
	Passenger ships	C [1,3,4,5,20]	
	Tourism Accommodation, marine	C [1,3,5]	
	Tourism Accomodation, terrestrial	C [1,3,5]	
Research	*Bioprospecting Research*	C [5,6]	
	Scientific Geophysical Surveys, Research	C [1,3,5,6,8]	
	Scientific Research and Monitoring	C [5,6,8,9,20]	
	Hydrographic Surveys	C [1,3,5,6,8,9]	

Table A2. SMSP Zoning codes for allowable activities (updated 22 November 2022 with comments from SC23 and TWG16). The codes in this table apply to the numbers in the Allowable Activities in Table 4 for the SMSP Zone 2 areas. Coding comes from regulations, scientific studies, government reports, unpublished studies, expert advice and/or best available information. Stakeholders have been involved in the development and refinement of the restrictions and codes since 2015.

Code #	Codes for Allowable Activities
1	See General Management Considerations. Approved management plans needed including Environment Impact Assessment (EIA)/Environmental and Social Impact Assessment (ESIA), where applicable.
2	See definition of Subsistence Fishing. Subsistence fishing is intended to serve staff at facilities or with essential infrastructure for the zone, including enforcement. Need quotas and monitoring of any species harvesting. Subsistence is intended to apply only to island residents and non-commercial activities, and does not apply to hotel guests, commercial activities including fishing vessels, paying guests. Needs management plans in some cases. In Zone 1, if there is a private residence or research and commercial, subsistence fishing is not allowable.
3	Development proposals require a transparent and participatory process with all stakeholders. May or may not require an environmental impact assessment (EIA)/ Environmental and Social Impact Assessment (ESIA). See #1.
4	Permanent mooring buoys recommended, where practical. Anchor in designated areas.
5	Restrictions may apply to avoid or minimise disturbance on key species and ecological functions.
6	Government approved permit required for research and monitoring activities.
7	Restrictions or prohibitions on gear or technique may apply. Catch and release may be required, depending on species targeted. Some techniques may be prohibited, such as popping.
8	All vessels conducting seismic surveys must have necessary functioning acoustic equipment and adequately trained operators to detect the presence of cetaceans to avoid and minimise detrimental effects at all times during operation in accordance with strict, international published scientific guidelines for minimising disturbance to cetaceans (e.g. JNCC Guidelines for Marine Mammals 2017).
9	Allowable in Zone 1 only for scientific surveys (e.g., data collection and bathymetry, not extraction).
10	Exploration and development phases must adhere to strict standards for the sector incl. health, safety and environment
11	Jet skis are prohibited in Marine National Parks (Zone 1) and in Desroches, Poivre, Alphonse and Farquhar Archipelago Zone 2 (see Outer Islands Project).
12	In accordance with bag limits, catch limits, rod limits and other gear, catch or fishing effort restrictions found in regulations, policies, management plans, or international conventions and agreements. Reporting requirements and catch & release best practices (e.g. NOAA catch & release).
13	Foreign-owned fishing vessels must adhere to Seychelles Fisheries Act, Part IV Fisheries Management, Reg. 5, First Schedule: *Zones where Fishing by Foreign Vessels is prohibited*. The area of the zones described in this Schedule are shown in red lines on charts ML/ADN/73B deposited in the office of the Director of Surveys. These zones are indicated on the MSP maps as double blue lines.
14	No setting or deployment of drifting Fish Aggregating Devices (dFAD). To pick up DFADs so as to avoid or prevent them grounding or landing on islands, atolls, offshore rocks. To recover grounded dFAD.
15	Maritime safety and security in accordance with Seychelles Maritime Safety Authority (SMSA), Seychelles Defense Forces (SDF) and other relevant delegated authorities.
16	The number of activities offered by hire craft may be limited, depending on the area's objectives.
17	Fisheries observers, electronic monitoring systems (EMS), vessel monitoring systems (VMS), and FAD management required; no FAD deployment for purse seine or longline in Zone 1. Note: A FAD management plan (2022) includes impacts and FAD vs free school sets (SFA)

18	Automatic Identification System (AIS) needed for navigation. Note: Direction to use or not use AIS may change in relation to piracy or other security and safety threats in Seychelles.
19	To provide essential access and/or infrastructure for the zone, including enforcement. In consideration when the impacts to marine environment may be less than the impacts to the terrestrial environment. Includes jet skis and other watercraft.
20	Jet skis and other motorised devices such as underwater scooters and motorised paddleboards are prohibited except where authorised for research or essential services (see #19)

Table A3. Seychelles MSP Initiative (2022) Master List of Definitions for Allowable Activities Tables – Uses and Activities. DRAFT. Seychelles Marine Spatial Plan.

Marine Activity	Description of the Use or Activity in Allowable Activities Tables *(with source, where noted)*
Part A. Fisheries	
Aquaculture	The cultivation, propagation, or farming of fish, and includes cultivation, propagation or farming from eggs, spawn, spat or seed, or by rearing fish taken from the wild or imported into Seychelles, or by similar process, and the collecting and holding of live fish, and includes both inland aquaculture & mariculture in the marine environment. (draft revision Fisheries Act 2022)
Aquaculture, coral planting	
Artisanal Fishing (multiple gear types)	These fisheries use small, motorised boats. Targets fish on the sea floor (demersal), semi-pelagic species and numerous invertebrates at different times of the year using a variety of gear and vessel types: handline, trap, harpoon and net for lobster, mackerel, octopus, shark, demersal fish, and semi-demersal fish.
Fly fishing	A sport fishing method in which artificial fly is cast by use of a fly rod, a reel, and a relatively heavy oiled or treated line. (SFA common fisheries terms). The weight of the line is used to cast a very lightweight fly that would not be heavy enough to be cast with a conventional spinning or casting rod.
Fly fishing, blue water	Fly fishing that occurs in blue water or open sea, also called offshore fly fishing. Fishers generally target big game or pelagic species using special teasing technics to land fish similar to the conventional fishermen's landing while Big Game Fishing (M. Cosson).
Fly Fishing, lagoon	Fly fishing in a shallow body of water separated from the ocean by sandbars, barrier island, or coral reefs (National Geographic). Fly fishing on the beach, lagoon, and ocean flats, reef flats, inner flats, pancake, finger flats. It is done on foot or from a boat with or without the use of an engine or a push pole. This method is highly dependent on the depth of the water and species being targeted (M. Cosson).
Industrial Pelagic Longline	The use of fishing gear in which short lines (branch lines or droppers) carrying hooks are attached to a longer main line at regular intervals. Pelagic longlines are suspended horizontally at a predetermined depth with the help of surface floats. The main lines can be as long as 100 km and have several thousand hooks. Droppers on demersal longlines (set at the seabed with weights) are usually more closely spaced (IOTC). Pelagic longline refers to a drifting longline consisting of a mainline kept near the surface or at a certain depth by means of regularly spaced floats with relatively long snoods with baited hooks evenly spaced on it (SFA common fisheries terms).
Industrial Purse Seine (free school)	Industrial purse seining is a method of fishing targeting tuna schools using purse seine nets. Purse seine nets are a long wall of netting framed with a lead line and a float line. A purse line threaded through purse rings spaced along the bottom of the net is drawn tight (pursed) to stop the school of fish escaping downwards under the net. Usually undertaken by fleets from foreign origin. (SFA common fisheries terms). Free school means fishing on a free-swimming school of tuna without the use or association with FADs (atuna.com)
Industrial Purse Seine (floating objects, drifting FAD)	An industrial purse seine fishery using floating objects or FADs (fish aggregating devices) fishes on anchored, drifting, floating, swimming or submerged objects or group of objects, of any size, that has or has not been deployed, that is living or non-living, including but not limited to buoys, floats, netting, webbing, plastics, bamboo, logs, whales and whale sharks that fish may associate with (IOTC).

Marine Activity	Description of the Use or Activity in Allowable Activities Tables *(with source, where noted)*
Industrial Purse Seine Supply Vessel	Also known as support vessels or auxiliary vessels, these vessels are not equipped with any fishing gear but assist one or several purse seiners in the detection of tuna schools and the management of the stock of artificial fish aggregating devices (FADs) and buoys used to locate both natural floating objects (LOGs) and FADs. Activities of support vessels related to fishing include the building and deployment of FADs, the visit of LOGs and FADs, the transfer of buoys, and the retrieval of FADs and buoys. In addition, support vessels also contribute to increasing the fishing time of the purse seiners they assist through the transport of persons and materials and repairing operations (Assan et al. 2015)
Recreational Fishing	Fishing of aquatic animals that does not constitute an individual's primary resource to meet basic nutritional needs and are not generally sold or otherwise traded on export, domestic or black markets (FAO 2012 Technical Guidelines for Responsible Fisheries No. 13). Catching fish as a sport (UK sports fishing definitions). In the Seychelles, the recreational fishery sub-sector is active mostly on weekends and in the evenings. These recreational fishers utilize mostly handline fishing techniques, targeting demersal species such as groupers, snappers and lethrinids, and semi-demersal species such as carangids and sphyaenids (FAO fishery Country Profile).
Semi-industrial fishing (hand gathering, hook & line, longline)	The semi-industrial longline is a local fishery targeting tunas, swordfish and other pelagic fish using monofilament longline (SFA). Semi-industrial longline vessels in Seychelles voluntarily fish off the Mahé Plateau. The fishery extends to the Outer Islands as far as the Aldabra Group.
Sport fishing (multiple activities)	Any fishery undertaken for sport or recreation which involves the hiring, chartering or leasing of a vessel not exceeding 40 metres in length overall but which does not result in the trading, offering for sale or selling of fish (SFA common fisheries terms). A form of fishing practiced inshore, offshore and onshore. This fishing activity may be practiced as either part of a tournament for prizes or for recreational purposes. When part of a competition the fishery might have an array of rules such as catch and release stipulations or type of bait (Matthieu Cosson).
Subsistence Fishing	Fishing where the fish caught are shared and consumed directly by the community, families and kin of the fishers but which does not result in the trading, offering for sale or selling of fish (SFA common fisheries terms; approved July 2022 by MSP). Subsistence fishing occurs throughout Seychelles. Subsistence fishing is fishing for personal consumption or traditional/ceremonial purposes (Source: OECD 2001). Subsistence fishing refers to fishing, other than sport fishing, that is carried out primarily to feed the family and relatives of the person doing the fishing. Generally it also implies the use of low tech or artisanal fishing techniques and is carried out by people who are very poor. Subsistence fishing can catch a large variety of species but generally only those relatively close to shore or in fresh water. Issues with subsistence fishing include problems of contamination in the food and struggles to access the resource. Very rarely is there a problem of a subsistence fishery threatening a fish stock. In some parts of the world, there are a variety of issues related to the definition and competition between different resource users (World Fisheries Trust 2008). A study on Perception of Subsistence and Informal Fishers in South Africa Regarding the Management of Living Marine Resources had these key elements of subsistence: dependence on fishing to survive, not relying on other sources of income, living close to the resource, and harvesting fish to eat or sell in order to meet basic food requirements, using low technology gear (as part of a cultural or traditional practice) and relying on the harvest to meet nutritional needs (Source: Rudman and Nieman, Duke University 2022).
Part B. Maritime Infrastructure	
Ballast and Bilge Dumping	Ballast water is used to improve ship's stability, and the sea water is exchanged while at sea, and sometimes at port. Ballast water transport micro-organisms, including viruses and bacteria, and may contain invasive and non-native species such as tunicates and sponges. Bilge dumping occurs when the contents of a ship's bilge are emptied or flushed into the sea. Bilge water may contain oil and other toxins, as well as invasive species depending on the origins of the bilge's contents.

Marine Activity	Description of the Use or Activity in Allowable Activities Tables *(with source, where noted)*
Bunkering at Sea	Supplying fuel to ships for their own use. Involves the transfer of fuel from one vessel to another. Bunkering may be needed for Petroleum activities and Scientific Geophysical surveys. Bunkering is not allowable within Seychelles EEZ for commercial fishing vessels (Fisheries Act 2014; not in Revised Draft Fisheries Act 2022).
Bunkering at Sea (fishing vessel)	
Commercial Shipping	The use of maritime vessels to carry goods (The Mary Conlin Company). The International Maritime Organisation (IMO) specifies traffic regulations. In the Seychelles, there are no traffic separation schemes but there are dedicated North and South Approaches as laid down by the IMO and clearly marked on British Admiralty charts No. 740 and 742. Also, there are North and South Reporting Points, Areas to Be Avoided, and Designated Anchorages both inside and outside the Port Limit that have been adopted by the IMO (Seychelles Port Authority). Includes transportation of petroleum during extraction in Seychelles.
Desalination, boat-based	A water purification process that removes salt and other minerals from sea water. Desalination is a common solution to overcome water scarcity that uses different technologies including membrane technology, distillation process (thermal technologies) and chemical approaches. Membrane technologies are the most common and use either pressure driven or electrical driven technology. Pressure driven membrane technologies include reverse osmosis, nanofiltration, ultrafiltration and microfiltration. Reverse osmosis is considered most effective in salt removal. Desalination requires energy and for seawater, pumps may need to generate up to 1200 psi and is a substantial energy use (Source: Journal of Contemporary Water Research and Education 2005). Desalination systems for boats include portable and built in units. Sometimes branded as 'watermakers', desalination systems are used for drinking water, showers, and vessel maintenance like deck washing. The seawater is run through a series of pre-filters and then a high pressure pump moves the water through one or more membrane housing. The brine or wastewater is discharged overboard and the desalinated water is pumped into holding tanks (Cruising World 2019).
Desalination, land-based	Desalination, see above. On land.
Disposal, Dumping, Dredge spoils	Disposal of dredged materials at sea, at designated sites. Or dumping of approved (or not approved) materials into the ocean. Includes dumping of oil, hydrocarbon or plant based.
Dredging, coastal	The removal of mud or sand from the seabed, often done at or near a port to increase the depth of water or to restore it to its previous depth. Dredging is used in Seychelles to improve access to atolls in the Outer Islands through lagoons. Dredging may be necessary or essential in marine protected areas to secure access for research, management, monitoring and enforcement. Dredging may occur for an activity or use in consideration when the impacts to the marine environment may be less than the impacts to the terrestrial environment.
Ferries and Transportation	Passenger carrying vessels that operate between two points of land. In the Seychelles, there are ferries between Mahé, Praslin and La Digue islands. Private ferries also operate within the Inner Islands.
Patrols and Surveillance	In Seychelles this refers to the government fisheries patrol vessels for monitoring, control and surveillance of activities regulated by the Fisheries Act and fisheries management plans.
Ports, Marinas, Wharves, Jetties	Ports and marinas are facilities designed to attract and accommodate commercial vessels or ships, industrial vessels, community, public or private vessels and uses. Includes docks, wharves, piers, ramps, breakwaters, and related structures in harbours, marinas and ferry terminals, and associated marine services (e.g., ways, repairs, food services, pump-out sites, fuel). Structures may be affixed to the foreshore and seabed by pilings or floats, or involve foreshore fill. Includes commercial ports. Includes the marine area that defines a port boundary and also marine transportation areas. Wharves are places that boats tie up to unload and load cargo or people. The wharf typically has front and rear loading docks (aprons) (Global Marina Institute). Jetty is a structure projecting out from the shore; a jetty may protect a harbour entrance (Global Marina Institute). In Seychelles, harbour is Port of Victoria and any bay, roadstead or place within three nautical miles from any coast within the Republic of Seychelles (Seychelles Harbour Act and Seychelles Fisheries Bill).

Marine Activity	Description of the Use or Activity in Allowable Activities Tables *(with source, where noted)*
Reclamation	The process of creating new land from oceans and other aquatic habitats. In the Seychelles, the first reclamation projects began in the 1960s on the east coast of Mahé for the port and airport expansion. Between 1973-1999, four more reclamation projects brought reclaimed land area to 750 ha. A reclamation project completed in 1999 created another 350 ha (East Coast III).
Renewal Energy, deep water thermal	A set of technologies that use the temperature differential between warm seawater at the surface of the ocean and cold seawater at between 800 – 1000 meter depths to produce electricity (IRENA). Ocean Thermal Energy Coupling, or OTEC, development could be located along edge of a plateau or shelf drop (needs a vertical drop of ~1,000 m) and may be suitable for atolls with steep dropoffs. OTEC is expensive to develop and uses a floating platform with transmission lines (up to 200 MW). Another technology is the DOWA – Deep Ocean Water Application. DOWA uses a system to pipe cold deep water located at depth to a shore-based facility. The water passes through a series of heat exchangers to cool down a closed freshwater circuit network that is connected to infrastructure such as air conditioning for target buildings. The DOWA technology is aimed to achieve a net energy savings as compared to creating energy for cooling from electricity. A DOWA Project was prepared for Port Louis in Mauritius in 2013 to bring 0°-5°C seawater from a depth of 1,000 m from a distance of 7.5 km offshore and through 5.5 km of closed freshwater circuit (Source: AFDB 2013).
Renewable Energy, solar (marine)	The harnessing of solar energy and subsequent conversion into electricity (IEA-ETSAP/IRENA). In the marine context, this includes floating or anchored solar panel farms or arrays. This activity is in shallow water; deep water solar panel arrays were not considered a future activity.
Renewable Energy, tidal	The harvesting of energy created by tidal flows due to flood and ebb currents (IRENA). In Seychelles, tidal energy generaion is a potential for the larger atolls only as water moves through the channels in and out of the lagoons.
Renewable Energy, wind (offshore)	The use of ocean-based turbines to harness wind energy and turn it into electricity (IRENA). There is an 8-turbine wind farm on two artificial islands off the east coast of Mahé, installed. The marine context includes anchored offshore wind and projects involving reclamation of land or development of artificial islands.
Renewable Energy, wave	Wave energy converters capture the energy contained in ocean waves and use it to generate electricity (IRENA). The marine context includes floating or anchored wave energy farms or arrays.
Underwater Cables	Underwater lines and structures including, but not limited to those used for flow, transit, distribution or broadcast of water, electricity and telecommunication services for public and/or private purposes. Generally on or under the seabed or anchored to the seabed but may also be suspended in the water column. Includes associated infrastructure and rights of way and/or dredging restriction areas or zones; underwater cables are mapped with exclusion buffers. Underwater cables may require dredging and disturbance of the seabed. There is an underwater cable for fibre optics from Tanzania to Beau Vallon on Mahé.
Part C. Non-renewable Resources & Bioprospecting	

Marine Activity	Description of the Use or Activity in Allowable Activities Tables *(with source, where noted)*
Bioprospecting Development	In relation to activities under the scope of the Fisheries Act (revised, draft Nov 2022) means the systematic search for and development of new sources of chemical compounds, genes, micro-organisms, macro-organisms, and other valuable products from fish and entails the search for economically valuable genetic and biochemical resources from fish. (Fisheries Act, draft revised November 2022). The systematic search for biochemical and genetic information in natural sources that can be developed into commercially valuable products for pharmaceutical, agricultural, and other applications (UNDP). This activity includes the search or exploration phase as well as development. If bioprospecting is for scientific, social or cultural research purposes only, see definition for Bioprospecting Research. It is carried out by a wide range of established industries such as pharmaceuticals, manufacturing and agriculture as well as a wide range of comparatively new ones such as aquaculture, bioremediation, biomining, biomimetic engineering and nanotechnology. The benefits include an unexpected variety of products that include chemicals, genes, metabolic pathways, structures, materials and behaviours. These may provide physical blueprints or inspiration for new designs. Criticism aimed at bioprospecting has been addressed, in part, by international treaties and legal agreements aimed at stopping biopiracy and many activities are now funded by agencies that require capacity-building and economic benefits in host countries. Contemporary bioprospecting has multiple goals including the conservation of biodiversity, the sustainable management of natural resources and economic development. See also Bioprospecting Research, non-commercial uses.
Deep-sea Mining	Marine operations associated with extracting minerals and aggregates (including sand and gravel) from offshore areas, as well as related facilities and infrastructure used during mining operations at-sea. Includes mining for polymetallic nodules (e.g., ferromanganese nodules), rock concretions that lie on the seabed sediment (ISA).
Petroleum Geophysical Surveys, Exploration	The search for oil and gas resources using seismic, electrical, gravity, or magnetic data to evaluate the Earth's subsurface (Schlumberger). In Seychelles, licensed concessions are present on and off the Mahé Plateau. Including Methane.
Petroleum Exploration, Drilling	The creation of wells in the ocean floor to locate subsurface oil and gas deposits (Source: Schlumberger)
Petroleum Development, Production, Extraction	Development refers to the phase of petroleum operations that occurs after exploration has proven successful, and before full-scale production. The newly discovered oil or gas field is assessed during an appraisal phase, a plan to fully and efficiently exploit it is created, and additional wells are usually drilled. Production refers to the volume of petroleum produced (Schlumberger). Includes Petroleum shipping, the movement of hydrocarbons on ships. Including Methane.
Sand Mining	The extraction of sand from the ocean floor, typically used to make building materials and for beach nourishment to protect coastlines (World Ocean Review). Sand mining has taken place off the north and west coasts of Mahé.
Part 5. Tourism & Recreation	
Anchorages and Mooring Buoys	Includes anchoring sites and mooring buoys for recreational and small artisanal fishing vessels. Includes temporary vessel anchoring at designated sites, mooring buoys. Does not include docks, wharves, peers, or related facilities in marinas and harbours. Commercial moorings are large, permanent moorings for large commercial vessels, typically associated with a commercial port. They are used by commercial vessels or ships prior to entering a port's shoreside facility. In Seychelles, commercial moorings are heavily used all year round.
Passenger Ships	Passenger ship that is carrying or capable of carrying more than twelve passenger (Merchant Shipping Act 1994). Passenger ship intended to provide passengers with a full tourist experience. All passengers have cabins. Facilities for entertainment aboard are included (OECD).

Marine Activity	Description of the Use or Activity in Allowable Activities Tables *(with source, where noted)*
Floating Structures	As different from tourism accomodation, marine. Floating structures to support residential accommodation, commercial, and non-profit uses including the service industry. Includes floating homes, restaurants, visitor centres, and entertainment; temporary or permanent. Future floating structures may include vessels or buildings with pontoons. Floating structures do not include those supporting renewable energy infrastrucutre – see renewable energy.
Hire craft	A boat let out for hire for fishing as a sport or for pleasure purposes only and includes the hiring of any craft (Control of Hirecraft Act). Renting or chartering a sailboat or motor yacht and travelling to various coastal or island destinations, or for other marine recreational activities such as fishing. Refers to marine charters, licensed hire craft.
Motorised Activities (watercraft, ships)	Recreational activities aboard any vessel equipped with an engine. Includes recreational vessels such as motorboats, jetskis and sailboats with motors, hovercraft, and submersibles. If the recreational activity needs support from a motorised vesself for it to take place, example SCUBA diving at an offshore reef, it is a motorised activity. See also Watercraft, Hirecraft. For recreational activities involving Fishing see Fishing activities.
Non-Motorised Activities	Recreational activities that don't use an engine or motor. Includes sailboats without an auxiliary motor (electric or fuel), stand up paddle boards, kayaks, snorkeling. If motorised, see "Motorised Activities"
Passenger ships	Means any boat, ship, hovercraft or other water going craft that takes passengers, and refers to vessels used or intended to be used for fishing or related activities (revised Draft Fisheries Act 2022).
Tourism Accommodation, marine	Undersea resorts and hotels that are accessible only via SCUBA (Luck, Encyclopaedia of Tourism and Recreation in Marine Environments). See also Floating Structures.
Tourism Accommodation, terrestrial	Resorts and hotels located on land for tourism activities are included here for any activity that may affect marine species, habitats or ecosystems. May have a coastal or marine component for guest activities, and the marine component falls under the MSP. The law does not allow building below the high water mark. Activities that need to be managed and monitored include sewage discharge, lighting, generator operations, moving fuel containers or fueling.
Part 6: Research	
Bioprospecting Research	Bioprospecting is the search for product/compounds derived from plants, animals, and microorganisms that exhibit useful properties (e.g., plant-based pharmaceuticals, agriculturally important compounds from fungi, natural products such as latex). Many of these products or compounds are mediated by the organism's stress response. An organism's ability to respond to stress enormously influences its survival. There are several approaches to bioprospecting revolving around collection of samples, sample processing/analysis via extraction of compounds or genetic information, and analysis of products for bioactivity or other applications. When working with plants, bioprospectors are extracting RNA, lipids, proteins, and metabolites to unravel the molecular signatures of a plant's response to stress. Plastics researchers may isolate microbes from various environmental sources and test for the ability of the plants or animals to degrade plastic. A new area of research is the combination of these two topics for the study of plastics in the rhizosphere. (source: University Texas). Bioprospecting includes surveying, collection, characterisation, inventories, taxonomic identification, bioassay and genetic sequencing to identify genetic resources and information. It also includes gathering information on associated Traditional Knowledge for the purpose of discovering its commercial value.
Scientific Geophysical Surveys	The use of seismic, electrical, gravity, or magnetic techniques to evaluate the Earth's subsurface (Schlumberger)
Scientific Research and Monitoring	Activities designed to establish or expand knowledge of the marine environment and undertaken by educational institutions, research institutions, surveyors, research companies or consultants. Also includes citizen science, non-profit activities and locally based research and monitoring activities.
Hydrographic Surveys	Scientific research technique used to measure the depth and bottom configuration of water bodies. Vessels primarily use side scan and multibeam sonar (NOAA)

Appendix C: Management actions explanatory text

Summary table of proposed management actions for all three draft management plans, and the explanatory text for each action. The explanatory text explains the rationale for the inclusion of the action and the intent behind it. This explanatory text should be used by stakeholders to ensure that the feedback provided is informed and relevant to the specific action.

A. ECOLOGICAL AND BIODIVERSITY OBJECTIVE

Action no.	Proposed management action	Explanatory notes
1.1	Designate anchorage areas (and if feasible provide moorings) to reduce damage to coral reef and seagrass habitats	Damage to important and sensitive habitats was identified as a priority issue by stakeholders, particularly as climate change pressures accelerate. This action aims to protect coral reef and seagrass habitats that are important habitats for many species and are easily damaged by careless anchoring. The location of designated anchorage areas will avoid sensitive coral reef habitats, will be situated where they provide shelter under different prevailing winds weather conditions, and will be mapped for all users of the Area. Noting that in some area where there is extensive seagrass cover, the designated anchorage may be within ephemeral meadows, e.g. around Providence Island. While not mandatory, it is recommended that all vessels anchor in these designated areas whenever possible. The provision of public moorings will depend on need, available resources, and feasibility. High resolution habitat maps for shallow marine areas around many islands already exist and will inform this action to the extent possible.
1.2	Identify and implement fishing limits for high-risk species or during vulnerable life history stages for key species (e.g. during spawning aggregation and nursing periods)	Overfishing, and illegal, unreported and unregulated fishing were identified as priority issues by stakeholders. This action is intended to prioritise species for management that are likely to need it most. High risk species may include species assessed as being overfished or are experiencing levels of fishing that may compromise populations, or species with life history characteristics that make them more susceptible to over-exploitation (e.g. low productivity species). Populations can also be at risk due to certain characteristics of their life cycle that make them more susceptible to over-exploitation. Examples are when a species aggregates together at the same time and place for spawning; when a species traverses through a known migration route; or a species juvenile stage is concentrated in accessible mangrove or lagoon areas and can be heavily exploited. Uncontrolled fishing of high-risk species, especially during vulnerable life history stages could cause species to become rare and could lead to reproductive collapse, a situation when the stock is no longer able to rebuild itself due to various demographic factors including larval limitation and dispersal. This action aims to identify and protect high risk species and vulnerable life history stages. The action requires the development of criteria and a standardised process for identifying relevant species and/or life-history stages and its implementation. Fishing limits might differ among species and could include size limits, bag limits, boat limit, possession limits, gear restrictions, spatial

		closures, temporal closures, fishing bans, etc. limits. Incorporated in the process would be the identification of research needs for these species and undertaking of research (through the Scientific Committee). The process should be science-based and include the participation of stakeholders.
1.3	Establish no discharge zones for wastewater and ballast water within 2 km of islands and atolls by vessels more than 15 m in length	Marine pollution and lack of biosecurity measures were identified as priority issues by stakeholders. The impacts of wastewater can be significant at local scales if discharged close to sensitive habitats (e.g. coral reefs) and ballast water can introduce non-native pest species into Seychelles waters. The action aims to minimise incidents of wastewater impacts and introduced species through ballast water around islands and atolls, where shallow water sensitive habitats are found. The distance from islands and atolls follows international best practice, to ensure effective protection of sensitive habitats, and the nominated vessel length means the action only applies to larger vessels with more passengers that have holding tanks and can comply with the rules.
1.4	Implement programs to reduce impacts of marine litter and pollution on marine wildlife, e.g. beach clean-ups, awareness campaigns	Marine litter and pollution were identified as a priority issue by stakeholders, as they have negative impacts on marine species and habitats. Documented impacts include entanglement and death of marine wildlife, physical damage to sensitive habitats such as coral reefs, changing species behaviour, and limiting access to beach habitats for nesting. Dispersal simulations indicate that most of the terrestrial marine debris that reaches the beaches of the Seychelles outer islands originates from Southeast Asia and fishing vessels, particularly industrial fishing. This action will help to reduce the risk of marine litter and pollution to wildlife, including marine turtles and seabirds, through organised clean ups (removing the threat) and raising awareness of measures that can be implemented to reduce local sources of litter and pollution.
1.5	Establish and enforce aircraft corridors to minimise disturbance to seabirds.	Disturbance of nationally significant seabird sites, such as for sooty tern, red footed booby and tropic birds in the Cosmoledo and Astove Archipelago, was identified as a priority issue by stakeholders. Aircraft can impact seabirds by disturbing them during take-off and landing, and impacts can be especially severe during the breeding season if parents abandon their nests. Aircraft can also collide with seabirds during fight or landing, which can also be a danger to the aircraft. Meanwhile, aircraft are vital to movement of people and supplies to the outer islands. This action aims to facilitate cooperation between island managers and aircraft operators to identify specific corridors and conditions for aircraft movements to minimise disturbance to seabirds, an important biodiversity component of sustainable use (Zone 2) areas and maximise aircraft safety.
2.1	Investigate options for management of aggregation sites and ecological corridors for megafauna, threatened and endangered species	Impacts on threatened and endangered species were identified as a priority issue by stakeholders. Many species of marine mega-fauna gather at specific locations or use specific habitat corridors during certain periods of the year for migration, feeding, breeding, calving, or nursing their offspring (e.g. mobulid rays and whale sharks feeding areas, cetacean nursery areas). These aggregation sites and habitat corridors have unique physical characteristics that create favourable conditions for these species. As such, these sites are extremely important in the life history of these wide ranging mega-fauna, many of which are ecologically important and in low densities. This action is designed to identify and document important aggregation sites and habitat corridors in

		sustainable use (Zone 2) areas and, where relevant, develop and implement actions to reduce impacts. Implementing this action would require a process to identify these sites and their timing and assess management options suitable to minimise impacts. The very recent release of tracking research results demonstrating the location of hawksbill turtle foraging areas (e.g. Fortune Banks) represents an excellent local case study, whereby the research outcomes could be assessed under this action (once implemented) to determine appropriate management measures.
2.2	Retrieve drifting FADs of high risk to habitats and species	The stranding of drifting FADs (DFADs) from the industrial tuna fishery onto coral reef habitats, lagoons and beaches of islands have been associated with damage of habitats and the entanglement and death of marine species (e.g. sharks, turtles). This action forms part of a suite of measures to reduce the negative impacts of FADs on marine biodiversity. The action proposes to make use of satellite-based real time data to ensure tracking and accountability for all drifting FADs and to intercept and retrieve FADs considered as a high risk of stranding onto shallow marine habitats and on islands or entangling marine wildlife. Its implementation should help to reduce the number of FADs that are stranded and their impact on marine biodiversity. The implementation of this action will require the development and implementation of a program for FAD retrieval or the reorganisation of FAD-watch. The adopted program should consider a range of factors including options to improve surveillance, defining and identifying risk levels to inform retrieval decisions, retrieval options, financing options, and cost-effectiveness of options. For example, definition of a 'High-risk' FAD may be one that is drifting towards a reef and/or located near turtle nesting beaches or feeding sites of ETP species. The program should be delivered through an updated national DFAD management plan.
2.3	Remove stranded FADs of high risk to habitats and species	Numerous FADs are stranded on coral reefs, in lagoons and on beaches throughout the Seychelles outer islands. These stranded FADs continue to have negative impacts through physical alteration and destruction of habitats and entanglement of certain species. This action is targeted at removing already stranded FADs to eliminate their continuing destructive impacts. The implementation of this action will require the development and implementation of a program for FAD retrieval (as part of the updated national DFAD management plan) and should consider a range of factors including mapping the location of stranded FADs, defining and identifying risk levels to inform retrieval decisions, retrieval options, options for re-use or safe disposal, financing options, and cost-effectiveness of options. It is expected to be an integral part of the new proposed program for FAD retrieval or the reorganisation of FAD-watch. Its implementation would require collaboration and cooperation between the purse seine fishing sector, the government of Seychelles and other Seychellois entities.
3.1	Promote and contribute to the update of the national FAD management plan to	The Seychelles FAD management plan (2020 – 2022) has not been updated. Some stakeholders are of the opinion that the 2020 – 2022 FAD management plan only covered the minimal conditions of the IOTC and is not ambitious enough in implementing measures to reduce the impact of drifting and stranded FADs on marine habitats and marine biodiversity. This action promotes and supports the updated of the Seychelles DFAD management plan

	ensure that it addresses national priorities	to address the multiple concerns that were raised by stakeholders on the ecological impacts of DFADs on targeted and non-targeted species as well as on habitats resulting from stranding. As part of Resolution 19/02 Procedures on a Fish Aggregating Devices (FADs) Management Plan, Seychelles is required to on an annual basis, review Management Plans for the use of FADs. The SFA would be responsible for leading the annual update of the DFAD management plan. Stakeholders requested for the processes to update the DFAD management plan to be inclusive and transparent and identified this action as a high priority for implementation.
3.2	Require the use of best practice guidelines for catch and release fishing, including fish with signs of barotrauma	This action aims to promote international best-practices in catch and release fishing and for species with specific catch limits with the purpose of maximising the survival of released fish. The action would feed into the Code of Conduct for the concerned fisheries that provides best practice methods for minimising fish stress and injury during the capture, landing, handling and release process, including recognising the signs of barotrauma and understanding swim bladder correction methods for fish release. The action will draw on relevant local and internationally developed materials. Its implementation will require training of fishing guides, charter fishing operators and local commercial fishermen in techniques for handling fishes that are to be released, including relieving symptoms of stress and barotrauma, release methods, and the selection and use of fishing gears that result in less injury during fish catching and handling. This approach recognises that most species are vulnerable to barotrauma under certain conditions and that post-release survival can be maximised through appropriate training and adherence to well-developed Codes of Conduct. The Codes of Conduct should also promote the transition of sport fishing towards a predominantly catch and release fishery. This action encourages managing authorities to work with the relevant fisheries sectors (recreational, charter and commercial fisheries) to promote catch and release fishing in recreational fisheries and the release of high-risk species in commercial fisheries. This action is based on awareness, and compliance does not prevent the fisher keeping caught fish, apart from those that might be controlled in current and future fisheries management plans.
3.3	All lagoon fly fishing shall be catch and release only	Lagoon fishing includes all forms of fly fishing that occurs within the shallow waters of an atoll or island lagoon (see Appendix D of the Management Plan). This is a high value activity of great importance to the Seychelles. Most fly fishers selectively target a few iconic species which are photographed and then released. This action will make this common practice mandatory, so that anyone participating in lagoon fly fishing activities must release all fish that they catch, helping to ensure the sustainability and value of the fishery.
3.4	All catch and release fly fishing (lagoon) must use single barbless hooks only	The type of gears that are used for catching fish are important factors in determining the level of stress and injury that a fish suffers during the catching, landing, handling and release process. Certain gears are known to cause physical injuries to fish that reduces their post release survival. As lagoon fly fishing is a predominantly catch and release recreational fishing activity, that relies on having healthy and diverse fish population, it is important to maintain high biomass of the targeted stocks. High biomass would contribute to higher and more diverse catch per unit effort and could contribute to greater customer satisfaction and higher participation. To ensure that fish

		are released in good condition and have the best chances of surviving to be 'caught again another day', this action makes it mandatory for all forms of fly fishing in the Sustainable Use Zones to be conducted using only one single barbless hook.
3.5	Establish a national training and accreditation scheme for fly fishing (lagoon) guides, with only accredited guides able to lead fishing charters	The Seychelles is internationally recognised as a high quality and sustainable fly-fishing destination. Lagoon fly fishing is a specialised form of fly fishing that is popular in the Seychelles. It usually takes place in shallow, environmentally sensitive habitats such as seagrass meadows. Many of the fish species targeted occur in low numbers and as such needs to be handled appropriately to ensure their survival and continued contribution to the industry. Fly fishers coming to the Seychelles seek high quality experiences and are generally willing to pay higher prices compared to other well-known fly-fishing destinations. The local fly-fishing industry is focused on having smaller, more sustainable numbers of high value fly fishers visiting the Area. This action aims to safeguard that reputation and contribute to ensuring the sustainability of the industry by making it mandatory for only guides that are properly trained and accredited to lead fly fishing charters and/or groups. This action requires the managing authorities to work with an accredited education provider (e.g. the Seychelles Maritime Academy) and the Seychelles Qualification Authority to establish the training program and an accreditation scheme. The implementation of this action could create education opportunities and career pathways for Seychellois and could be instrumental in maintaining the country's high ranking as a lagoon fly fishing destination.
3.6	Establish and implement appropriate catch limits and gear restrictions for sport and recreational fishing	Overfishing, and illegal, unreported and unregulated fishing were identified as priority issues by stakeholders. This action aims to promote sustainable fishing practices though managing how much is caught and what methods and gears are used for fishing to avoid negative impacts. This action is a fisheries management measure and applies to local commercial fishing, sport, fly, and recreational fishing. Therefore, it would be expected that the Seychelles Fishing Authority would play a significant role in the development of specific measures under this proposed action, and that management measures may also be included in relevant fisheries management plans (e.g. the outer islands fisheries management plan). It is also expected that implementing this action would involve stakeholder participation. Once established, specific bag limits and/or equipment restrictions will be permit conditions for local commercial fishers, sport, fly, and recreational fishing. Definitions of sport fishing, fly fishing and recreational fishing are as per the Fisheries Regulations. Implementation of this action will require a process including steps such as: identifying sectors and species that may require specific management; identifying appropriate catch limits and gear restrictions; etc.
3.7	Prohibit all fishing in reef passes leading into lagoons between 1st November and 1st March.	The outer islands have spawning aggregation sites that are used by one or multiple species, particularly groupers, during their reproductive periods. Fishing on spawning aggregation sites can be extremely efficient and can easily wipe out the reproducing population and threaten entire stocks. Most of the known spawning aggregation sites in the outer islands are found along reef passes leading into lagoons. For the main species of aggregating groupers, research has shown that spawning aggregations usually form in the months from November to March.

		The aim of this action is to protect spawning aggregation sites without having to reveal their specific locations. Implementation of this action would require further work to clearly define and document areas that are considered as a "reef pass", as well as identifying candidate species, with recommendations for research as required to inform implementation.

A. GOVERNANCE OBJECTIVE

Action no.	Proposed management action	Explanatory notes
4.1	Establish a single multi-sectoral representative management committee to provide strategic decision making and oversee implementation	Lack of transparency and accountability in decision making as well as a lack of access for Seychellois to outer islands were identified as priority issues by stakeholders. This action provides for a multi-sectoral co-management committee of diverse representatives to be established to provide strategic guidance and advice for decision making regarding management, and empowered to influence and guide policy and management decisions. To maximise coordination and efficiency, a single multi-sectoral committee would be established for all Sustainable Use (Zone 2) Areas. Establishing this committee aligns with the governance structure described in the Draft Seychelles Oceans Authority Bill. The establishment of the co-management committee should take into account lessons learned from the current co-management approach and committee that oversees implementation of the Mahe Plateau trap and line fishery co-management plan 2019.
4.2	Establish a complaints and resolution framework that involves an independent body	Lack of transparency and accountability in decision making and management of Sustainable Use (Zone 2) Areas were identified as priority issues by stakeholders. This action requires the establishment of an independent formal complaints and resolution mechanism (either new or building on an existing framework) for stakeholders to access if they have a grievance related to Sustainable Use Area management or implementation. This mechanism must be administered by an independent body that is not involved in the use or management of Sustainable Use Areas.
4.3	Establish and implement a transparent and equitable permit system	Stakeholders identified a lack of transparency and equity in decision making as priority issues. This action will help to address these issues by establishing a fair, equitable, and transparent permit system. Under these arrangements, any user who wishes to conduct an allowable activity (Table 4) for commercial purposes will need to apply for a permit. The permit system is intended to be implemented through the Seychelles Ocean Authority which will coordinate permits amongst all implementing line agencies (including recognising and integrating existing licencing/permit systems), creating a single 'one-stop shop' for managing those permits

		relevant to the Sustainable Use Area. Permit applications would be assessed using a standard assessment process that is clear, equitable, and documented for all stakeholders. The development and implementation of the permit system should also include (1) mandatory compliance with relevant codes of conduct; (2) a process to establish capacity limits for allowable activities that may impact marine habitats and species; (3) a fair process for allocating permits amongst stakeholders; (4) the requirement for an Environmental and Social Impact Assessment (ESIA) as part of the application process for commercial sector activities considered 'high risk' to the environment and other users; (5) a fee structure and guidelines for activity permit applications and ESIAs; and (6) payment of a security bond for large maritime infrastructure and commercial projects (those requiring a Class I ESIA) that can be used to remove discarded materials or rehabilitate sites if there is non-compliance with ESIA conditions. Relevant components of the permit system and its establishment are provided through several other proposed actions. These types of arrangements hav been in place for many years in many marine parks around the world such as the Great Barrier Reef Marine Park, and will also help to address priority issues including damage to habitats, unsustainable fishing practices, and coastal development.
4.4	Determine capacity limits for allowable activities that may impact marine habitats and species	Risks from habitat degradation, overfishing, oil and gas exploration, and a lack of effective and equitable management were identified as priority issues by stakeholders. This action will initiate a process to determine appropriate limits for the number of permits issued for activities where overuse can impact marine habitats and species. These activities may include aquaculture, fly fishing tourism operators, semi-industrial fishers, sport fishing tourism operators, dredging, ferries and transportation, ports/marinas/wharves/jetties, renewable energy, bioprospecting, mining, petroleum, passenger ships, hire craft, floating structures and yacht tourism. Establishing capacity limits will also help to manage potential future increases in use and visitation to minimise conflict and ensure that the experiences and values provided to users and visitors are maximised and maintained. The process to establish capacity limits will be led by MACCE in consultation with key stakeholders and managing authorities.
4.5	Develop new or review existing Codes of Conduct for allowable activities	The Seychelles Marine Spatial Planning Initiative identified a list of Allowable Activities for each of its three defined categories of zone through a participatory consultation process. Numerous stakeholders have also proposed that Codes of Conduct (including existing codes of conduct and best practices) should be considered in the management plans. To help limit the environmental impacts of the Allowable Activities and optimise the effectiveness of existing codes of conduct, a risk-based process will be initiated to identify which activities require Codes of Conduct, whether Codes of Conduct should be voluntary or mandatory for each activity, and to review existing, or develop new Codes of Conduct as required. These Codes of Conduct will set the norms, rules, responsibilities and behaviours while undertaking the different allowable activities, and will help to ensure that there is no ambiguity among operators about expected standards and

		behaviours. Codes of conduct that are deemed voluntary will be communicated to all users to encourage them to adopt these standards. Codes of Conduct that are deemed mandatory will be included as permit conditions for permit holders.
4.6	Design and implement a system for allocating permits that is equitable for all stakeholders	Stakeholders identified the need for equitable access to opportunities and fair benefit sharing as priority issues. Economic equity is also a core guiding principle of the MSP process. This action will develop a process to determine how the permits issued for an activity will be allocated amongst permit applicants and will include consideration of existing access arrangements, business viability, and equitable sharing benefits. The allocation process will be led by MACCE in consultation with key stakeholders and managing authorities.
4.7	Establish a financial framework to ensure permit application fees and commercial levies support management and implementation	Lack of capacity and resources for management, compliance and enforcement, research and monitoring, and high cost of managing remote areas were identified as priority issues by stakeholders. This action adopts the 'user-pays' approach where all users accessing the Areas through the permit system and those obtaining commercial benefit from using the Areas should contribute to the costs of its management. This action develops a framework that establishes fee and levy structures and guides the allocation of fees and levies for administration and implementation costs (e.g. management, compliance and enforcement, research and monitoring). The framework will also guide the determination and management of ESIA costs, including bonds which will be held in trust as 'insurance' to ensure that sufficient funds are available to clean up or repair any environmental damage resulting from an activity. The framework will maximise the funds collected to be directed to management, and compliance and enforcement of the Area, and to ensure the use of funds is reported transparently. This action requires managing authorities to explore mechanisms to recover costs and fairly distribute the funds raised through this mechanism to the relevant managing agencies, and report on funding and expenditure. This type of cost recovery mechanism is common in marine parks around the world, and has already been implemented for tourists visiting the existing marine parks in the Seychelles.
4.8	Develop and implement a financial framework to support management that includes sustainable funding mechanisms	Lack of capacity and resources, lack of funding, and the high cost of monitoring, control and surveillance were all identified by stakeholders as priority issues in sustainable use (Zone 2) areas. Lack of funding and resources is a key barrier to effective management, and implementation of sustainable use management plans will be ineffective if there are not enough resources to implement effective compliance and enforcement. This action aims to identify and secure funding and resources to ensure that sustainable use area management and compliance and enforcement can be effectively implemented, and will include strategies for obtaining funding and guiding the allocation of funding across the different implementation components.
5.1	Establish a scientific committee to provide technical advice,	Lack of knowledge and awareness about sustainable use areas, particularly the outer islands, was identified as a priority issue by stakeholders, which compromises informed and effective management. Management

	coordinate and facilitate research and monitoring activities, and oversee the research permitting processes	needs to understand the state of the ecosystem, the biological processes that sustain it, and the way sustainable use areas are accessed and used to implement strategies that protect biodiversity and allow for sustainable use. This action requires that a Scientific Committee made up of suitably qualified individuals is established (aligned with existing relevant bodies) to provide strategic guidance and coordination of research efforts, oversight of research access and research permit processes for all Sustainable Use (Zone 2) Areas. To maximise coordination and efficiency, a single Scientific Committee is recommended for all Sustainable Use (Zone 2) Areas. The oversight of coordinated research and integration of findings will ensure that management of sustainable use areas remains adaptive. Establishing this Scientific Committee aligns with the governance structure described in the Draft Seychelles Oceans Authority Bill and in intended to build on existing national scientific advisory groups.
5.2	Develop and implement a Research & Monitoring Strategy for marine Sustainable Use Areas	Lack of knowledge and awareness about sustainable use areas, and limited research and conservation focus were identified as issues by stakeholders. This action aims to develop a National Research and Monitoring Strategy for marine sustainable use (Zone 2) areas to guide activities that ensures management is based on the best available science that addresses key knowledge gaps. The National Research and Monitoring Strategy will be developed through a consultative approach to identify key information needs, the priority research that needs to be undertaken, and the approaches to ensure that research is collaborative, multi-institutional and multi-disciplinary. Research priorities for the sustainable use areas need to form an integral part of a National Research and Monitoring Strategy with site specific as well as national scale priorities and monitoring specific to support the Performance Management Framework for sustainable use areas. Once developed, the Research Strategy will be managed by the Scientific Committee (see related action) that will be responsible for providing technical advice, coordinating, and facilitating research and monitoring activities, and providing oversight of research permitting processes.
6.1	Develop and implement a risk-based Compliance and Enforcement Plan to support implementation and inform co-management agreements	High levels of Illegal, Unreported and Unregulated (IUU) fishing and wildlife poaching were identified as priority issues by stakeholders. In addition, lack of capacity and resources for monitoring, control and surveillance (MCS), and the high cost of MCS were also raised as priority issues. This action aims to develop a risk-based plan for compliance and enforcement that addresses these issues, and supports effective implementation of sustainable use area management plans. The challenge is that the outer islands are remote locations that are difficult to monitor and conduct surveillance, and therefore this action requires co-managing authorities to develop a single risk-based compliance and enforcement plan that is coordinated between all relevant agencies to ensure that the rules and requirements of Sustainable Use Areas are adequately enforced. A risk-based approach aligns with global best practice and requires ongoing collection of compliance data to direct enforcement efforts to where it is most likely to reduce the highest risks (including where and when to deploy surveillance). A risk-based approach also serves to ensure limited

		enforcement capacity is used where its most needed. The compliance and enforcement plan should include a review of options to support the cost-effectiveness of the plan, including: making use of existing surveillance infrastructure and systems, identifying and assessing existing technology, and identify new and emerging technologies to monitor these areas. The plan should also incorporate processes for identifying options for regional coordination and diplomacy to address IUU originating from overseas countries.
6.2	Optimise use of surveillance and detection technologies for monitoring and management of illegal activities	Poaching and Illegal, Unreported and Unregulated (IUU) fishing were identified as high priority issues that urgently need to be addressed in sustainable use (Zone 2) areas. The challenge is that these activities occur in remote locations that are difficult to monitor and conduct effective and timely surveillance. This action directs the managing authorities to examine existing technology and identify new and emerging technologies to monitor activities, and optimise the way these technologies are deployed to enhance surveillance and detection of illegal activity. This action will help to optimise the success of the compliance and enforcement plan, and address poaching and IUU fishing.

A. SOCIAL AND CULTURAL OBJECTIVE

Action no.	Proposed management action	Explanatory notes
7.1	Implement education and awareness programs to raise awareness of the values of the Area and management measures to protect them	Lack of local awareness about the values and importance of Sustainable Use (Zone 2) Areas was identified as a priority issue by stakeholders. This action aims to develop and implement a strategy and programs to help users and Seychellois understand biodiversity, social and cultural values, threats and the need for management of sustainable use areas, how people are using these areas, and the rules that apply to the sustainable use areas, including educating people of the rationale for rules. This increased awareness and understanding is important for increasing compliance with management plan rules. A critical part of education and awareness is developing programs that are specifically targeted to different stakeholders and user groups, and to provide for easy access to information as it becomes available (e.g. new research findings).
7.2	Prohibit fishing along the famous Coral Wall dive site (northwest side of Astove Island)	Stakeholders highlighted the unique aesthetic value and importance of the 'Famous Coral Wall' on the NW side of Astove Atoll, and its importance to scuba dive tourism as one of the best dive sites in the Seychelles. This action prohibits all forms of fishing within a designated area along a narrow stretch along the NW side of Astove Atoll to preserve this area as a pristine scuba

		diving site. Implementation of this action includes the designation of the specific area where fishing is prohibited (see Figure 4; coordinates for this designated area are at Appendix A).
7.2	Increase opportunities for locals to visit the area	Lack of access for Seychellois to Sustainable Use (Zone 2) Areas, particularly the outer islands was identified a a priority issue by stakeholders. This action aims to develop opportunities for Seychellois citizens to visit and experience their marine environment, particularly the outer islands. Increasing opportunities and visitation will allow Seychellois to experience the area, and increase community appreciation of biodiversity, social and cultural values.

A. ECONOMIC OBJECTIVE

Action no.	Proposed management action	Explanatory notes
8.1	Undertake a baseline social and economic valuation to inform capacity limits, potential development or expansion of sustainable local businesses, and management decisions	Lack of information about the economic and social values of each Sustainable Use (Zone 2) Area was identified as a priority issue by stakeholders. This information is important to understand how the sustainable use areas are used, how management can balance biodiversity conservation with sustainable use, the potential for user pays, and where economic and social activities can be optimised in a sustainable manner. This action will conduct a study to document the economic and social values of the sustainable use areas in the Seychelles MSP. Implementing this action would require a national approach that could potentially be extended to other marine zones, and a collaborative process involving: identification of new and/or expanded opportunities; an evaluation of these opportunities for their economic feasibility (e.g. profitability, local interest, etc); and the willingness for a user pays approach in sustainable use areas.

Appendix D: Mandate of the Seychelles Oceans Authority

The mandate of the SOA is the administration, coordination, oversight, monitoring and evaluation, review and adaptive management of the Seychelles Marine Spatial Plan. Responsibilities for the SOA include:

- Governance of spatial planning – the Seychelles Ocean Authority Act (SOAA) will explicitly incorporate the power of marine spatial planning to the Authority (i.e. marine protected or management areas up to the high water mark).
- Monitoring, evaluation, mid-term review and 5-yearly consultative revision of the SMSP.
- Holding regular meetings of the Board to guide the strategic implementation of the SMSP. The SOAA will specify the Board meet at least quarterly.
- Hold regular meetings of the Management and Scientific committees respectively.
- Ensure pertinent international obligations (i.e. MEAs - UNFCCC, CBD, PSMA etc…) are appropriately incorporated into the SMSP management cycle, reported upon as required and provide advice/information to Government (GoS) on pertinent international relations.
- Give guidance to, coordinate the SMSP activities of and promote compliance from MSP implementation agencies – the SOAA will require line agencies to report on SMSP implementation as per the SMSP and its schedules and formats.
- Oversee the practical issues of Zone and Protected Area management in line with their designation, including the establishment of parameters and criteria for SMSP development management – e.g. allowable activities for each zone and their realisation.
- Oversight, coordination and, where appropriate, implementation of:
    - Develop standard formats for Protected Area (PA) management plans and reporting.
    - Develop and review PA draft management plans with clear measures to support area and SMSP objectives.
    - Realisation of efficiencies, synergies and optimal use of capacities.
    - Monitoring of management plan implementation.
- Develop SMSP scientific practices (through the function of the stakeholder Scientific Committee in liaison with NISTI):
    - Identify data requirements to support SMSP and Area management plan objectives.
    - Identify data requirements to support priority, area-specific management objectives.
    - Establish criteria for SMSP datasets to facilitate analysis and utility.
    - Undertake independent peer review of all datasets.
    - Identify strategic, crosscutting and key knowledge and data gaps (including those pertaining to climate change) for SMSP management, and develop and promote the implementation of, a prioritised research agenda.
    - Develop prioritised management-oriented research agenda (incl. Oceanography).
    - Develop and review model data sharing agreement(s).
- Identify, inform stakeholders of and pursue, as appropriate, funding options and mechanisms to support the sustainable implementation of the SMSP.
- Explore and develop in partnership with the GoS means of raising and generating revenue/funds to support SOA operations.
- Public education, stakeholder communication and outreach.

Appendix E: Cosmoledo & Astove Archipelago Sustainable Use Area PMF Indicators – DRAFT

Management objective	Issue(s) being addressed (refer to Table 3)	Indicator No.	Ecological and biodiversity indicator	Indicator metric	Trigger level
To maintain and enhance the biodiversity and ecological integrity of the Area, including protecting unique ecological values, through science based and effective management.	Not enough research (or local involvement) (EB1)	EB7	Ecological and biodiversity research and monitoring investment	Number of research and monitoring projects; budget allocated to research and monitoring	
	Protect high values sites (EB10); climate change (EB12)	EB1	Coral reef status & trends	Benthic cover (%) by category	
	Protect high values sites (EB10); climate change (EB12)	EB2	Seagrass status & trends	Seagrass area; seagrass community composition	
	Poaching of threatened and endangered species (EB2)	EB4	Marine turtle population status & trends	No. nesting marine turtles	
	Poaching of threatened and endangered species (EB2)	EB5	SOCI status & trends	Sightings of flagship SOCI	
	Poaching of threatened and endangered species (EB2); IUU (EB1); Unsustainable use of resources (EB7); Declining shark populations (EB6)	EB6	Fish populations status & trends	Fish biomass	
	Poaching of threatened and endangered species (EB2); IUU (EB2); Unsustainable use (EB7); Declining shark populations (EB6)	EB8	Fisheries catch status & trends	Catch composition; catch per unit effort; length of target species	
	FADs and marine debris (EB5); FAD management and governance (G9)	EB9	FADS (lost) status & trends	Number of deployed FADS; number of retrieved FADS	
	Unsustainable use of resources (EB7)	EB11	Sport fishing status & trends	CPUE; catch composition; fish size; fate of catch; Number of rod-days fly fishing has occurred per area	
Management objective	**Priority issue(s) being addressed**	**Indicator No.**	**Social & cultural indicator**	**Indicator metric**	**Trigger level**

To facilitate equitable access for Seychellois to enhance the social benefits and cultural values of the Area	Lack of access for Seychellois citizens (SC1)	SC1	Tourism (visitor) status & trends	Number of visitors; nationality of visitors to outer islands	
	Lack of understanding and awareness about values (SC2)	SC2	Understanding ecological and cultural value of the islands	Survey data on understanding and awareness of values	
	Lack of understanding and awareness of values (SC2); Lack of transparency about what conservation activities and investment (SC4);	SC4	Education and awareness investment	Number of education and awareness projects; budget allocated to education and awareness	
	Lack of research, monitoring and baseline data (EB1); Lack of understanding and awareness about values (SC2)	SC6	Social & cultural research & monitoring investment	Number of research and monitoring projects; budget allocated to research and monitoring	
Management objective	**Priority issue(s) being addressed**	**Indicator No.**	**Governance indicator**	**Indicator metric**	**Trigger level**
(1) To ensure that uses of the Area are demonstrably sustainable, that illegal and undesirable activities are prevented, and that management is transparent, equitable, and implemented effectively.	Lack of capacity and resources for management (G3) (E1); Lack of funding for management, research and monitoring (E2)	G1	Investment in SU Area management	Annual budget for management authority; allocation for future years	
	Lack of capacity and resources for management (G3) (E1);	G2	Capacity for SU Area management	Number of positions filled; Number of positions vacant; annual staff turnover rate	
	Lack of capacity and resources for management (G3) (E1); Transparency about conservation and management (G4) (SC4)	G5	MCS plan developed and adopted	Has a plan been developed	
	Lack of capacity and resources for management (G3) (E1);	G6	Active MCS	Number of days in field spent on surveillance by aerial and maritime or island-based patrols (NOT radar)	
	Lack of capacity and resources for management (G3) (E1); Remoteness - for management and MCS (G6); High cost of MCS (E3)	G7	Effectiveness of MCS	Number of successful intercepts (MCS plan implemented)	
	IUU (EB2); No political will to develop laws to address illegal activities (e.g. IUU, poaching) (G4)	G9	Reports of IUU	Number of IUU fishing incidents reported by source (including a public reporting system if this system is established)	

	Lack of education on laws of the sea (G3; Illegal activities by locals (SC5)	G10	User awareness and respect for mgt plan	Survey data on user awareness of mgt plan rules; data on number of views and download of website, social media engagement	
	Lack of capacity and resources for management (G3) (E1); Remoteness - for management and enforcement (G12);	G11	Active MCS	Number of coastal radar stations operational days per year	
Management objective	**Priority issue(s) being addressed**	**Indicator No.**	**Governance indicator**	**Indicator metric**	**Trigger level**
(2) To facilitate research and monitoring about the areas' values, uses, status, and function to provide the information needed for science-based management of the area.	Lack of research, monitoring and baseline data (EB1); Lack of cooperation and communication (SC3)	G15	Research and monitoring strategy developed and implemented	Strategy published (Y/N); Resources allocated to support research activities (Y/N)	
	Lack of research, monitoring and baseline data (EB1); Lack of transparency (SC4); Lack of cooperation and communication (SC3); Lack of stakeholder participation (G7)	G16	Multi-sectoral scientific committee established	Committee established (Y/N); Committee meetings held and actions delegated (Y/N)	
	Lack of research, monitoring and baseline data (EB1); Lack of transparency (SC4); Lack of cooperation and communication	G12	Percentage of research permitees that provide research outcomes back to management authority	Percentage of permitees	
Management objective	**Priority issue(s) being addressed**	**Indicator No.**	**Economic indicator**	**Indicator metric**	**Trigger level**
To enhance, optimise, and diversify sustainable economic activities; facilitate equitable access to economic opportunities; and ensure	Overfishing (EB5); Equity in economic opportunities (E4)	E2	Fishing license status & trends	Number of active and latent fishing licences in artisanal, semi-industrial, charter, fly fishing, and industrial fisheries	
	Unsustainable use of resources (EB7); Equity in economic opportunities (E4)	E3	Fisheries activities	Number of active fishing days by semi industrial fishers from VMS data	
	Unsustainable use of resources (EB7); Equity in economic opportunities (E4)	E7	Fly-fishing permits	No. of permits allocated per island every year	

ANNEXES

i. IMPLEMENTATION & GOVERNANCE PLAN

To be developed once the Cosmoledo and Astove Archipelago Sustainable Use management plan is finalised.

ii. FINANCING PLAN

In development

iii. REGULATIONS & MCS PLAN

To be developed once the Cosmoledo and Astove Sustainable Use management plan is finalised.

iv. STAKEHOLDER ANALYSIS

The stakeholders that participated in the Cosmoledo and Astove Archipelago management plan development and have an interest in the future management of the Area have been recorded and the full analysis is pending.