

# DENIS ISLAND MARINE SUSTAINABLE USE AREA MANAGEMENT PLAN



MINISTRY OF AGRICULTURE,  
CLIMATE CHANGE AND ENVIRONMENT  
REPUBLIC OF SEYCHELLES



Denis  
PRIVATE ISLAND



DRAFT

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## SYMBOL & ACRONYMS

CBD	Convention on Biological Diversity
DIMSUA	Denis Island Marine Sustainable Use Area
DPI	Denis Private Island
EEZ	Exclusive Economic Zone
EDGE	Evolutionarily Distinct and Globally Endangered
GIF	Green Island Foundation
HABs	Harmful Algal Blooms
HWM	High Water Mark
IAS	Invasive Alien Species
IUCN	International Union for Conservation of Nature
MACCE	Ministry of Agriculture, Climate Change and Environment
METT	Management Effectiveness Tracking Tool
MPA	Marine Protected Areas
MSP	Marine Spatial Plan
NGOs	Non-Governmental Organizations
PAME	Protected Area Management Effectiveness
SDGs	Sustainable Development Goals
SeyCCAT	Seychelles Climate Change Adaptation Trust
SMSP	Seychelles Marine Spatial Planning
SFA	Seychelles Fishing Authority
TNC	The Nature Conservancy
WIO	Western Indian Ocean
WWF	World Wildlife Fund

## EXECUTIVE SUMMARY

The Denis Island Marine Sustainable Use Area (DIMSUA) Management Plan outlines a strategic framework for the sustainable management and conservation of marine resources around Denis Island from 2024 to 2030. Developed as part of Seychelles' commitment to marine protection and sustainable development, the plan integrates biodiversity conservation, sustainable resource use, and climate change adaptation within the context of the Seychelles Marine Spatial Plan (SMSP).

The DIMSUA Management Plan builds upon existing marine protection efforts and stakeholder engagement frameworks established by the SMSP. It encompasses a 29.6 km<sup>2</sup> marine area surrounding Denis Island and aligns with national legislation and policies. The plan development involved extensive stakeholder consultations, data review, and engagement with experts to ensure comprehensive coverage of management strategies.

The area faces various threats, including ocean warming, invasive species introduction, coastal erosion, poaching, anchor damage, marine debris, and petroleum exploration. These challenges necessitate proactive management measures to safeguard marine biodiversity, critical habitats, and sustainable resource use.

The plan proposes innovative financing mechanisms, habitat protection initiatives, monitoring and restoration efforts, equitable resource access, stakeholder engagement, and robust enforcement measures. It emphasizes adaptive management and mid-term reviews to assess progress, address emerging challenges, and optimize strategic objectives.

Roles and responsibilities are outlined for key stakeholders, including Denis Private Island, Green Islands Foundation, Ministry of Agriculture Climate Change and Environment (MACCE), Seychelles Coast Guard, National Information Sharing and Coordination Centre (NISCC) and the Seychelles Fishing Authority (SFA). Annual reporting and monitoring mechanisms are established to track progress and ensure accountability.

The vision of DIMSUA is to become an internationally recognized model of sustainability, balancing conservation with sustainable use through eco-tourism, sustainable fishing, species protection, and habitat conservation. The mission is to protect, conserve, restore, and sustainably manage marine resources within the area.

The DIMSUA Management Plan represents a holistic approach to marine resource management, integrating conservation, sustainable development, and adaptive management principles. By addressing current challenges and leveraging stakeholder collaboration, the plan aims to achieve its strategic objectives and ensure the long-term sustainability of Denis Island's marine ecosystem.



## ACKNOWLEDGEMENT

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# REPUBLIC OF SEYCHELLES

## 1. Introduction

### 1.1. Management plan purpose

In 2012, Seychelles made a commitment to designate 30% of its marine waters under biodiversity protection by 2020. In 2014, the Government of Seychelles and The Nature Conservancy (TNC) partnered for a debt swap project that included conservation and climate change adaptation goals. A necessary output of the<sup>1</sup> debt project was the development of a Marine Spatial Plan (MSP) to cover the boundary of the Exclusive Economic Zone (EEZ). The financial agreement was structured such that payments that Seychelles owed to creditors would instead remain in the country and are directed to a new, independent, locally based and led conservation trust fund called Seychelles Conservation and Climate Adaptation Trust, or SeyCCAT<sup>2</sup>.

The Seychelles MSP (SMSP) began in February 2014 and builds upon existing marine protection and planning efforts in Seychelles. It is a government-led process using a participatory, integrated, and multi-sector approach to support the health and sustainable long-term use of Seychelles' waters. The SMSP is aligned and integrates with national legislation, regulations, and policies as well as voluntary international obligations and national commitments. The SMSP has three objectives: expand marine protection to 30% of its marine boundary, support climate change adaptation, and advance the Blue Economy agenda. It supports the Government's commitment to the UN Convention on Biological Diversity (CBD) and the UN Sustainable Development Goals (SDGs).

The SMSP addresses or supports marine management issues in multiple sectors, including fisheries, conservation (environment), shipping and transportation, non-renewable resources, maritime infrastructure, tourism, and recreation. Seychelles' Blue Economy agenda is integral to the SMSP.

Implementation of the SMSP marine protection zones requires the development of Management Plans for each designated protection area, in alignment with the area's objectives, allowable activities, and management considerations that guide the development of each management plan. The scope of the SMSP management plans is indicated by the existing and possible future uses and activities that occur within the boundary of the marine protection area.

The current and past management plans were developed using best available information and stakeholder consultations and inputs. Looking ahead, a standardised management plan template to support the implementation of the SMSP marine protection zones and other protected area categories is being developed through an ongoing project led by SeyCCAT, expected to be completed in 2024. The aim of this process is to develop a template that is applicable for a range of sites from high to medium protection to sustainable use categories.

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<sup>1</sup> [www.seymsp.com](http://www.seymsp.com)

<sup>2</sup> [www.seyccat.org](http://www.seyccat.org)

The declaration of Marine Protected Areas (MPAs) has long been considered a key tool in the fight to conserve the world's marine biodiversity. Management plans are essential to enable effective and adaptive management of Seychelles' 13 designated MPAs. Management plans need to be accessible, clearly understood by stakeholders, dynamic, useful, practical, cost effective and time saving. They need to be flexible enough to be adopted by sites under a wide range of circumstances and be supported and endorsed by the Seychelles Government. The Seychelles Ministry of Agriculture, Climate Change and Environment (MACCE) is the central institution which has the authority to set standards, define practices and protected area management tasks and responsibilities. In the interim of setting up the Seychelles Oceans Authority (SOA) the SMSP Unit within MACCE is expected to oversee the implementation of such plans.

Harmonised management plans across all marine protection categories provide strong enabling conditions for successful strategic and coordinated management of marine resources in Seychelles' waters and the convergence of all MPAs to a common management approach, which is the long-term vision of the Seychelles Government (MACCE).

This is the first marine management plan developed to guide management of the Denis Island Sustainable Use Area.

## 1.2. Scope

The Denis Island Marine Sustainable Use Area (DIMSUA) Management Plan outlines a strategic approach to sustainably use, protect and restore DIMSUA's marine resources from 2024 to 2030. It provides an overview of the DIMSUA geology, history, and biodiversity, focusing on biodiversity conservation, sustainable use, and addressing current and future challenges. This Management Plan should serve as the primary strategic document for environmental management of the waters around the island.

The area's boundary is delineated by a 2 km zone around Denis Island and adjacent reef structures. Encompassing 29.6 km<sup>2</sup> of marine waters around Denis Island, this Management Plan falls within the boundaries of the Sustainable Use Area (Denis Island) (Marine) (Designation) Order (S.I. 79 of 2023), designated under the Nature Reserves and Conservancy Act, 2022. The boundary of the area is detailed in the gazetted Schedule of the Designation Order, covering a total area of 31 km<sup>2</sup> (Figure 1).

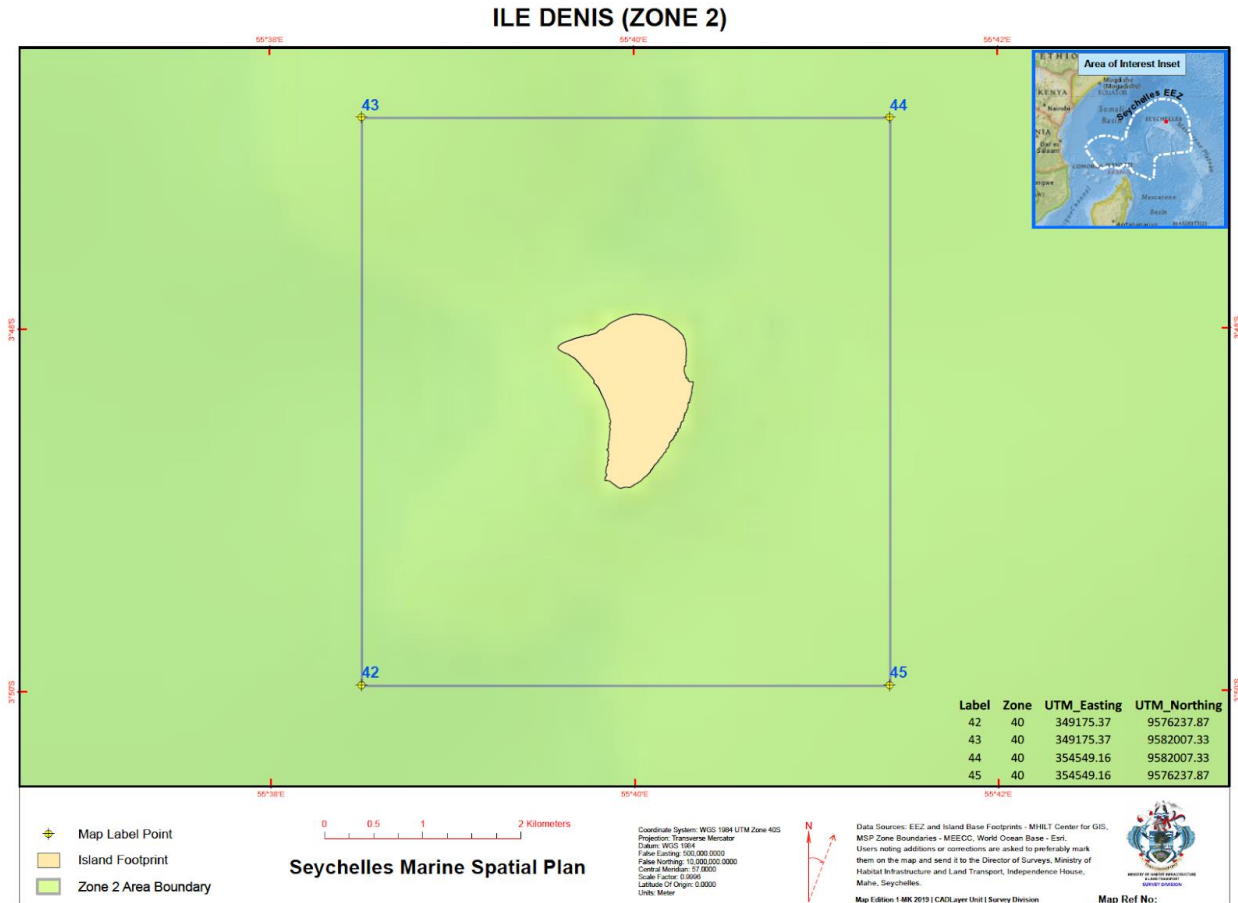


Figure 1: Map showing the location of the area of interest within the Seychelles Exclusive Economic Zone (EEZ) (insert on top right) and gazetted boundary of the Denis Island Sustainable Use Area.

### 1.3. Process

An initial desktop review was conducted, and a technical report summarizing the findings was submitted as part of the management plan development process. Relevant documents, including but not limited to the SMSP policy, SMSP nomination files for the Denis Island Sustainable Use Area, draft SMSP Allowable Activities Table, Management Plan template developed by Parks Work, Financing Plan for the Denis Island Sustainable Use Area, Nature Reserves and Conservancy Act 2022, and the Draft Fisheries Act 2023 (August 2023) were reviewed to gain insights into site usage, management requirements, potential challenges and opportunities, and the relevance of existing policies and legislation.

GIF provided existing baseline ecological data and reports from the past 10 years for review. Additionally, Bee Ecological Consulting conducted bi-annual surveys between 2022 and 2024, in collaboration with the Blue Economy Research Institute (BERI), to gather additional data. These surveys aimed to fill in gaps, particularly bathymetry and the updated status of coral reefs around the island (Supplementary Materials; DIMSUA Baseline Survey Report).

Both existing and newly collected data were utilized to inform the decision-making process to provide management direction for the DIMSUA. Furthermore, various researchers were engaged to

provide specific insights and guidance on the management strategies for seabirds (Dr. Chris Feare) and sea turtles (Dr. Jeanne Mortimer).

A participatory approach was adopted, as per global best practice, leveraging the robust stakeholder engagement framework established as part of the SMSP—a government-led process employing a participatory, integrated, and multi-sector approach (Figure 2). Relevant stakeholders were identified through this framework and consulted (Supplementary Materials; Stakeholders analysis Report).

Consultative process methods employed included in-person focus group meetings, one-on-one discussions, email exchanges, telephone conversations, and a tailored Google Form questionnaire (Supplementary Materials; Stakeholders analysis Report). These meetings aimed to present the preliminary findings, gather additional information on site usage and traditional knowledge (especially from fishers operating in the area), understand stakeholder expectations, identify priority issues, and provide an opportunity for stakeholders to contribute their input on potential management measures for implementation within the zone. The information gathered was then used to draft the first version of the plan and a more extensive internal review was undertaken with the core stakeholders i.e. Denis Private Island (DPI), Green Islands Foundation (GIF), Ministry of Agriculture, Climate Change and Environment (MACCE), Seychelles Fishing Authority (SFA), Seychelles Marine Spatial Plan (SMSP) Initiative. The draft Management Plan was made available on the SMSP website for a period of 28 days for public viewing. Stakeholders consulted during the process, were informed that the document is ready for review and the link was shared with all stakeholders who provided their email addresses. All feedback provided within the given timeframe was considered and incorporated accordingly to produce the final version of this plan.

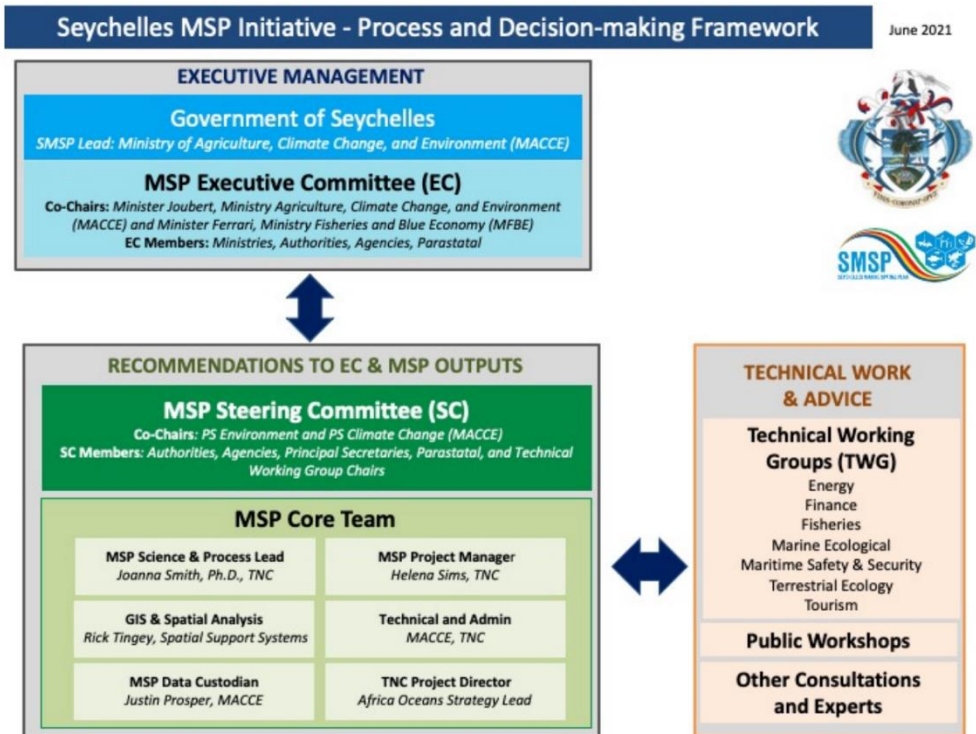


Figure 2. Process and Decision-making Framework from SMSP, 2024.<sup>3</sup>

#### 1.4. How to use this plan

The intent of this management plan is to guide the managers, stakeholders, and users of the DIMSUA on issues, allowable activities, management strategies and actions to protect and conserve its identified biodiversity values, while providing for reasonable opportunities to access and make use of the area for economic growth, education, recreation, and scientific purposes. The implementation of this plan is to be undertaken in accordance with other national policies, laws, and obligations of international conventions. It does not supersede any existing legal framework in place and should be amended accordingly as and when necessary to be in accordance with new enacted laws.

The plan forms the basis for the development of annual work plans and guides the management, reporting obligations, roles, and responsibility of each party. It also provides key tools for enforcement and surveillance, e.g. zonation map which clearly defines which activity is allowed within each area category defined in the zone. The plan also includes: Annex 1. Implementation and finance plan, providing an estimated cost of plan implementation; Annex 2. Additional laws and regulations and Annex 3. Surveillance, Patrol, and enforcement Strategy. This aims at guiding the use of the area by the different groups of stakeholders.

<sup>3</sup> SMSP, 2024, Seychelles Marine Spatial Planning; Available Online; URL: <https://seymsp.com/the-initiative/structure/>

## 2. Republic of the Seychelles

### 2.1. Nature

The Republic of Seychelles lies in the Western Indian Ocean, northeast of Madagascar. It is an archipelago of 115 islands with approximately 120,000 residents, three-quarters of whom live on the main island of Mahé. It is a 'large ocean state' with an EEZ of 1.35 million km<sup>2</sup> and land area of only 455 km<sup>2</sup>.

Marine and coastal biodiversity has been fundamental to the socio-economic development of Seychelles since French colonisation in the late 18th century. Seychelles has been an independent state since 1976. The Seychelles is recognized as a centre of plant biodiversity by the International Union for the Conservation of Nature (IUCN) and the World Wildlife Fund (WWF). Endemism is high at 50-85% for different animal groups and approximately 45% for plants in general.

Seychelles is grappling with challenges including control of invasive alien species, sustainable harvesting of fish stocks, efficient management of Protected Areas, climate change, rising sea levels, coral bleaching, and coastal erosion. As a Small Island Developing State, Seychelles is inherently vulnerable to the impacts and risks associated with climate change. Climate change induced elevated sea temperatures is causing coral bleaching and degradation of Seychelles coral reef ecosystems. Furthermore, overfishing is driving ecosystem and ecosystem service degradation, and reducing marine ecosystem resilience to climate change.

### 2.2. Population

As per the Seychelles National Bureau of Statistics (2023)<sup>4</sup> the resident population of Seychelles is estimated at 119,773 of which 64,730 are males and 55,043 females. According to the World Bank (2020)<sup>5</sup> the population density in Seychelles was 216 individuals per km<sup>2</sup> of land area. It is important to note that the population is not evenly distributed amongst the 115 islands. The population resides mainly on three inner Granitic Islands, the principal being Mahé with an estimated population of 651.3 individual/km<sup>2</sup>, followed by Praslin with 224.0 individual/km<sup>2</sup> and La Digue 109.3 individual/km<sup>2</sup> as of 2022.

### 2.3. Economy

Seychelles economy is based on two main sectors, tourism and fisheries. According to the World Bank, Seychelles boasts a GDP per capita of \$10,764, making it the most prosperous nation in Sub-Saharan Africa. The economy remains highly dependent on tourism, making it exceedingly vulnerable to global macroeconomic developments. Investor interests in the blue economy sector

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<sup>4</sup> Seychelles National Bureau of Statistics (2023) <https://www.nbs.gov.sc/downloads/1476-mid-2023-estimated-resident-population/viewdocument/1476>. Accessed 16 Feb 2024

<sup>5</sup> World bank (2020). <https://data.worldbank.org/indicator/EN.POP.DNST?end=2021&locations=SC&start=1961&view=chart>. Accessed 16 Feb 2024

are growing. Tourism depends heavily upon healthy marine resources, with tourist attractions including marine charters, sport fishing, and diving expeditions.

Fisheries remain the largest sector after tourism. Most Seychellois families have some connection with marine life, with fish being a staple in the Seychellois culture and diet. Seychelles fisheries including industrial tuna fishery provide more than 450,000 tonnes of fish per year, and fisheries is a primary contributor to the national GDP including exports. Fisheries, both artisanal and industrial, are directly dependent upon the sound management of marine resources.

#### 2.4. History and culture

The first humans settled on the islands only at the end of the 18th century; before then the entire archipelago was completely uninhabited. Having first become a French colony, then a British one, the Seychelles saw the arrival, along with the settlers, of numerous slaves from various parts of Africa. This mix of nationalities gave birth to a multicultural and multi-ethnic nation. Seychelles has three official languages. Creole is spoken throughout the country, English is used as the language of administration and French is also recognised. In the typical Seychellois cuisine, fish is seen as one of the staple foods, and the Seychellois are among the highest per capita fish-consuming people in the world, with a high reliance on fish for protein — consuming about 59 kg per year measured as live weight (Jensen et al. 2023)<sup>6</sup>. Fishing is a common activity amongst the nation be it as a profession or for leisure.

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<sup>6</sup> Jensen, I. J., Bodin, N., Govinden, R., & Elvevoll, E. O. (2023). Marine capture fisheries from western Indian ocean: an excellent source of proteins and essential amino acids. *Foods*, 12(5), 1015.



### 3. Regional and National Zonation Context

#### 3.1. Regional

The Western Indian Ocean (WIO) region has a coastline stretching for more than 15,000 km and a continental shelf area of some 450,000 km<sup>2</sup>. The vast area extends from Somalia in the north to South Africa in the south and covers ten countries (Comoros, France, Kenya, Madagascar, Republic of Mauritius, Mozambique, Seychelles, Somalia, South Africa, and the United Republic of Tanzania). Five of these countries are island States, adding to the region's unique geographical and ecological diversity. The combined population for the WIO region is 244 million, and the ten countries in the region are Contracting Parties to the Nairobi Convention which aims to address the protection, management, and the sustainable development of the coastal and marine environment of the WIO region.

The designation of MPAs, has long been considered a key tool in the fight to conserve the world's marine biodiversity, and the WIO countries have played their part, by identifying and declaring MPAs; from Tsitsikamma, the first MPA in Africa, proclaimed by the Government of the Republic of South Africa in 1964, to the MPAs proclaimed in 2019 by the Governments of Seychelles and the Republic of South Africa, and those proposed for imminent declaration by the government of Comoros. The region has established 143 MPAs (or equivalent), covering a total of 555 436.68 km<sup>2</sup>. The vast majority of these are coastal and/or inshore, however the largest, covering by far the greatest extents of the ocean are the few MPAs with considerable offshore deep-sea elements. These include the MPAs declared in Seychelles and South Africa's 20 MPAs, of which 14 are offshore sites, proclaimed in 2019.

#### 3.2. Seychelles MSP

To identify zones in Seychelles to meet the SMSP objectives for a 30% marine protection goal, an objective-based zoning framework was created with stakeholder input in 2014-2015. This framework adopted an integrated, multi-sector approach, which included input from the major sectors of Seychelles which use the Country's marine space, such as fishing, tourism, conservation, recreation, maritime security, and petroleum exploration, to develop an ecosystem-based climate-smart multi-use design, integrating the new challenges created by climate change into planning and management efforts.

In March 2020, an official Government announcement was made to legally designate more than 410,000 km<sup>2</sup> as marine protected areas. Five 'High Biodiversity Protection' Zones cover 203,235 km<sup>2</sup> and were designated as Marine National Parks, and eight 'Medium Biodiversity Protection and Sustainable Use' Zones cover 217,589 km<sup>2</sup> (Figure 3).

The 13 marine protection areas contain key areas for tuna, seagrass beds, corals, sea turtles and many other species and habitats. The protection areas are home to threatened species and economically vital fish stocks and include climate change refugia as well as important foraging areas. The remaining ocean areas are in a 'Multiple Use' Zone category, covering the remaining 70 % of Seychelles' EEZ.

The Seychelles MSP Zoning Framework (2015) includes three categories and objectives:

**Zone 1:** High biodiversity protection zones to allocate 15 % of the EEZ and Territorial Sea for high marine conservation and biodiversity goals, for representative species and habitats. This zone category is not suitable for extraction or seabed alteration. The SMSP designated areas in 2020 are: the Aldabra (Marine), Bird Island, Amirantes South, D'Arros Atoll, and D'Arros to Poivre Atolls.

**Zone 2:** Medium biodiversity protection and sustainable use zones to allocate 15% of the EEZ and Territorial Sea for medium marine conservation and biodiversity goals, for representative habitats and species. This zone is suitable for some level of extraction and seabed alteration, with appropriate management direction, depending on the objective of each designated area. The SMSP designated areas in 2020 are: Amirantes to Fortune Bank, the Cosmoledo and Astove Archipelago, the Farquhar Archipelago, Farquhar Atoll (Marine), Denis Island (Marine), Desroches Atoll (Marine), Alphonse Group (Marine) and Poivre Atoll (Marine).

**Zone 3:** Areas of multiple use and economic activity within a framework of the long-term sustainability of natural resources. These include high value and/or high priority areas for economic, social, and cultural benefit.

The Southern Mahé marine turtle Seasonal Protection Area has been proposed for Zone 3, a separate process to the SMSP and not included in the 30% designations in 2020. The SMSP process did not include any new marine protection designations in the Inner Islands.

Implementing protection and managing these zones will require significant additional effort, investment, and capacity to realize the conservation and sustainable use objectives outlined for the SMSP.

The Seychelles Government and Minister responsible for Environment has the overall responsibility to ensure the effective implementation and management of Seychelles' MPAs. Management, however, is a shared responsibility across Management Authorities and parties, including those who have statutory obligations to manage MPAs.

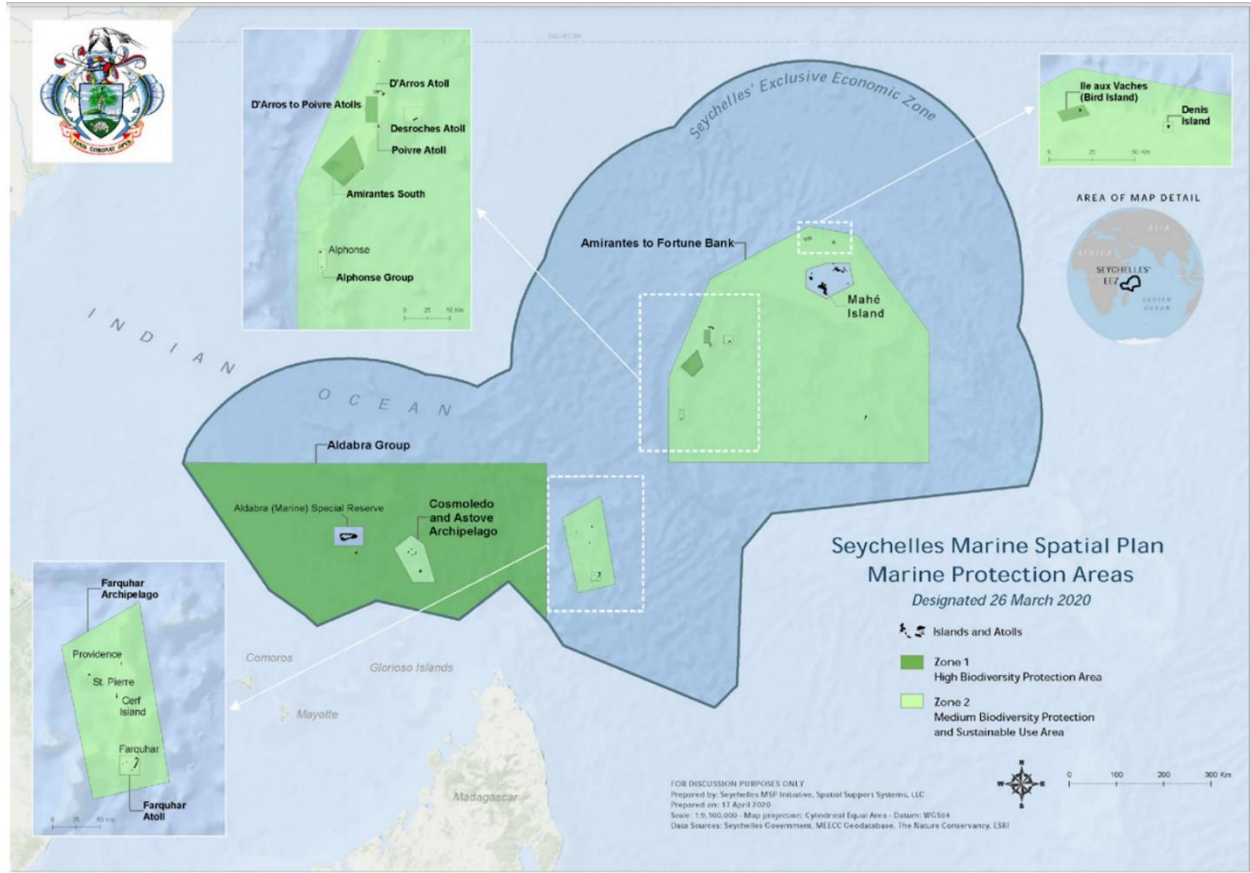


Figure 3. SMSP Marine Protection Areas (SMSP, 2024)<sup>7</sup>

<sup>7</sup> [https://seymsp.com/wp-content/uploads/2022/06/SeychellesMSP1Pager\\_A4\\_2022.pdf](https://seymsp.com/wp-content/uploads/2022/06/SeychellesMSP1Pager_A4_2022.pdf)

## 4. National Management Framework

Seychelles is a signatory to several international environmental conventions and has a suite of national legislation regarding the establishment of protected areas and environmental management, including the National Parks and Nature Conservancy Act, 1969 (subsequently replaced by the Nature Reserves and Conservancy Act 2022) which is the legislation under which all protected areas in the MSP have been designated, and the Environment Protection Act, 2016.

The designation of MPAs, has long been considered a key tool in the fight to conserve the world's marine biodiversity. The designation of an MPA, however, is no guarantee of effective protection. Critical to the long-term success of the SMSP will be ensuring that the laws of Seychelles support and facilitate the implementation of the marine spatial plan and adapting it over time, including enforcing the plan.

The completion of the SMSP for the full EEZ is scheduled for 2024, with implementation starting in 2025. Monitoring will play an important role to integrate and coordinate marine uses and activities in Seychelles for the long-term health of Seychelles' marine ecosystem and economic sectors.

### 4.1. Legal and policy framework

The Government of Seychelles has ratified several environmental related international conventions, and associated treaties and agreements, including the International Maritime Organisation Convention (1978); UN Convention for the Law of the Sea - UNCLOS (1984); Nairobi Convention (1985); UN Convention on Biological Diversity - UN CBD (1992); International Coral Reef Initiative - ICRI (1995); Convention on International Trade on Endangered Species - CITES (1997); Convention on the Conservation of Migratory Species of Wild Animals - CMS (2005); UN Sustainable Development Goals - UN SDG (2010).

Nationally, Seychelles have recently enacted a new legislation specific to protected areas, the Nature Reserves and Conservancy Act, 2022, which has been guided by the Seychelles' Protected Area Policy (2013)<sup>8</sup> and replaces the National Park and Nature Conservancy Act (1969). This provides the legal framework for designation and management of protected area in Seychelles.

Additionally, there are several other interconnecting policy and legislative frameworks which have been used to guide the development of this plan. The main ones include:

- Seychelles National Policy and Strategic Action Plan on Coral Reef Conservation and management (2021 -2025)
- Fisheries (Mahé Plateau Trap and Line Fishery) Regulations (2021)
- Seychelles Mahé Plateau Trap and Line Fishery Co-management Plan (2019)
- Maritime Safety Authority Act (2019)
- Seychelles Blue Economy Roadmap (2018)

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<sup>8</sup> Seychelles' Protected Area policy (2013). [https://seymsp.com/wp-content/uploads/2014/06/PA-Policy\\_OCT\\_2013.pdf](https://seymsp.com/wp-content/uploads/2014/06/PA-Policy_OCT_2013.pdf). Accessed 16 Feb 2024.

- Environment Protection Act (2016)
- Seychelles National Plan of Action for the Conservation and Management of Sharks (2016-2020)
- Seychelles National Biodiversity Strategy and Action Plan 2015-2020 (2014)
- The Fisheries Act (2014)
- Seychelles Sustainable Development Strategy (2012-2020)
- Seychelles National Climate Change Strategy (2009)
- Seychelles Fisheries Policy (2005)
- Wild Animal and Birds Protection Act (1966)

Additional laws and regulations are listed in Annex 2. Additional laws and regulations

#### 4.2. Protected Area designation and recognition

The Nature Reserves and Conservancy Act (2022), the drafting of which has been guided by the Seychelles' Protected Area Policy (2013) and replaces the National Park and Nature Conservancy Act (1969) provides the legal framework for designation of the five categories of Protected Areas in Seychelles, which align with the IUCN Protected Area categories, namely: (a) Strict Nature Reserve (IUCN Ia) (b) Ecological Reserve (IUCN IV); (c) National Park (IUCN II); (d) Protected landscape/seascape (IUCN V); and (e) Sustainable Use Area (IUCN VI). In the context of Denis Island, the area has been designated under the Sustainable Use Area (Denis Island) (Marine) (Designation) Order (S.I. 79 of 2023) and this Management Plan will be a regulatory plan that is legally enforced under The Nature Reserves and Conservancy Act, 2022.

The sustainable use status aims at managing and ensuring long term protection and maintenance of ecosystems and services, while providing at the same time a sustainable flow of natural products and services compatible with nature conservation. The primary objective is to protect and use natural ecosystems and resources sustainably, where conservation and sustainable use can be mutually beneficial.

#### 4.3. Tenure

The waters within the Seychelles Exclusive Economic Zone (EEZ) are managed through several different Acts and delegated authorities. The 29.6 Km<sup>2</sup> of water within the Denis Island Sustainable Use Area is public and managed under the jurisdiction of the Government of Seychelles. The DIMSUA surrounds Denis a privately-owned Island which does not form part of the Marine Sustainable Use Area.

# DENIS ISLAND MARINE SUSTAINABLE USE AREA

## 5. Sustainable Use Area Governance

### 5.1. Management body

The DIMSUA will be managed by the Denis Private Island (DPI) in collaboration with the Green Islands Foundation (GIF). DPI is interested in being the co-management authority for the marine area because of its longstanding commitment to environmental conservation and sustainable development. The resort on Denis Private Island (DPI) has been actively engaged in preserving the island's ecosystems, including native forests and habitats for endemic birds and turtles. While DPI handles field management, GIF contributes scientific research expertise to conservation activities on Denis Island. By partnering with GIF and participating in co-management agreements<sup>9</sup> with the Ministry of Agriculture, Change and Environment (MACCE), DPI aims to further its conservation efforts and ensure the sustainable use of marine resources in the designated area. This aligns with DPI's vision of being a self-sustainable refuge preserved for future generations, indicating its genuine interest in co-managing the marine area for conservation and sustainable development purposes.

The Nature Reserves and Conservancy Act 2022 defines “co-management” as an agreement between the person managing the protected area and another person or groups of persons interested in the preservation of that area and its resources, and the entities responsible for the conservation and sustainable use of the area and its resources;

Denis Private Island (DPI) is a privately-owned island which host a luxury resort owned and managed by Denis Island Development Pty (Ltd)<sup>10</sup>. The resort comprises some 23 villas<sup>11</sup> and employs 80 – 100 people on-island (Burt et al. 2016<sup>12</sup>; DPI 2024<sup>13</sup>). DPI core intent is rooted in its vision to be a self-sustainable refuge preserved for future generations (Denis Is., 2015<sup>14</sup>). Over the past 18 years, DPI has promoted a sustainable tourism marketing campaign, investing in conservation alongside sustainable development and has invested heavily in rehabilitating the island's ecosystems. DPI is responsible for the management, surveillance and enforcement of Denis Island and is anticipated to oversee management, monitoring, surveillance and enforcement of the DIMSUA through a co-management agreement with MACCE. Over the past 20+ years island management has invested

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<sup>9</sup> Not yet developed. The co-management agreement template is in development.

<sup>10</sup> Within this document the abbreviation DPI – which stands for Denis Private Island - is also used to refer to the on-island management entity in charge of current day-to-day operations of Denis Island and which is part of the larger Denis Island Development Pty (Ltd) company.

<sup>11</sup> Previously 25 but 2 have been lost to erosion.

<sup>12</sup> Burt et al (2016) The history, status, and trends of the Endangered Seychelles Magpie-robin *Copsychus sechellarum*. Bird Conservation International (2016) 26:505–523 doi:10.1017/S0959270915000404

<sup>13</sup> DPI, 2024, Denis Private Island Resort Retrieved from: <http://denisisland.com>. Accessed 13 Feb 2024

<sup>14</sup> Denis Is., 2015, Denis Island Environmental Management Plan 2016 – 2020. GoS/UNDP/GEF project: “Strengthening Seychelles’ Protected Area System through NGO Management Modalities.”

significantly into restoring native forests and providing a habitat suitable for endemic birds and turtles. In 2000 and 2002, DPI invested in eradicating cats and rats, respectively, from the island – and the island remains pest free to this day. In 2004 and 2008, four species of Seychelles’ rarest endemic birds – the Seychelles foody (*Foudia sechellarum*), Seychelles magpie robin (*Copsychus sechellarum*), Seychelles paradise flycatcher (*Terpsiphone corvina*) and Seychelles warbler (*Acrocephalus sechellensis*) – were translocated to Denis Island to establish insurance populations, an initiative that has improved their standing on the IUCN Globally Threatened Birds list. Denis Island’s shoreline provides an important site for hawksbill and green turtle nesting and turtle tagging and monitoring is ongoing. A strict catch and release policy are implemented whereby the coral reefs are not fished by the hotel.

DPI works in partnership with the Green Islands Foundation to implement its environment conservation projects and programs (Denis Is., 2015<sup>15</sup>). GIF has been a recipient of SeyCCAT Blue Grant Fund to expand existing relationships with artisanal fishers by conducting an extensive survey over a 12-month period to gather species-specific data on size, seasonality, and catch methods of local concern species.

Established in 2006, The Green Islands Foundation (GIF) is an environmental NGO based in Seychelles that aims to mainstream sustainable development (Figure 4). GIF is involved in the conservation management of small islands, which are privately owned, including Denis Island. The NGO has strategically positioned itself as a coordinator of local environmental initiatives and seeks to bridge the gap between the private sector and national environmental programmes.

GIF was created with (at the time) mandatory corporate social responsibility (CSR) fund allocations and this was its primary funding source until 2020 at which time the CSR requirement was removed (National Assembly of Seychelles, 2021<sup>16</sup>). GIF is currently seeking new revenues of funding. DPI continues to support GIF through company donations and in-kind support.

While DPI is responsible for all field management, GIF is responsible for the scientific research component of all conservation activities on Denis Island. and surrounding waters. GIF’s main function “is to support local industries make a positive impact on the ecosystems and surrounding environment they rely on for their operations.”

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<sup>15</sup> Denis Is., 2015, Denis Island Environmental Management Plan 2016 – 2020. GoS/UNDP/GEF project: “Strengthening Seychelles’ Protected Area System through NGO Management Modalities.”

<sup>16</sup> National Assembly of Seychelles, 2021, Corporate Social Responsibility Tax (Repeal) Bill, 2021 (Bill No. 17 of 2021) <https://www.nationalassembly.sc/legislation/bills/corporate-social-responsibility-tax-repeal-bill-2021-bill-no-17-2021>

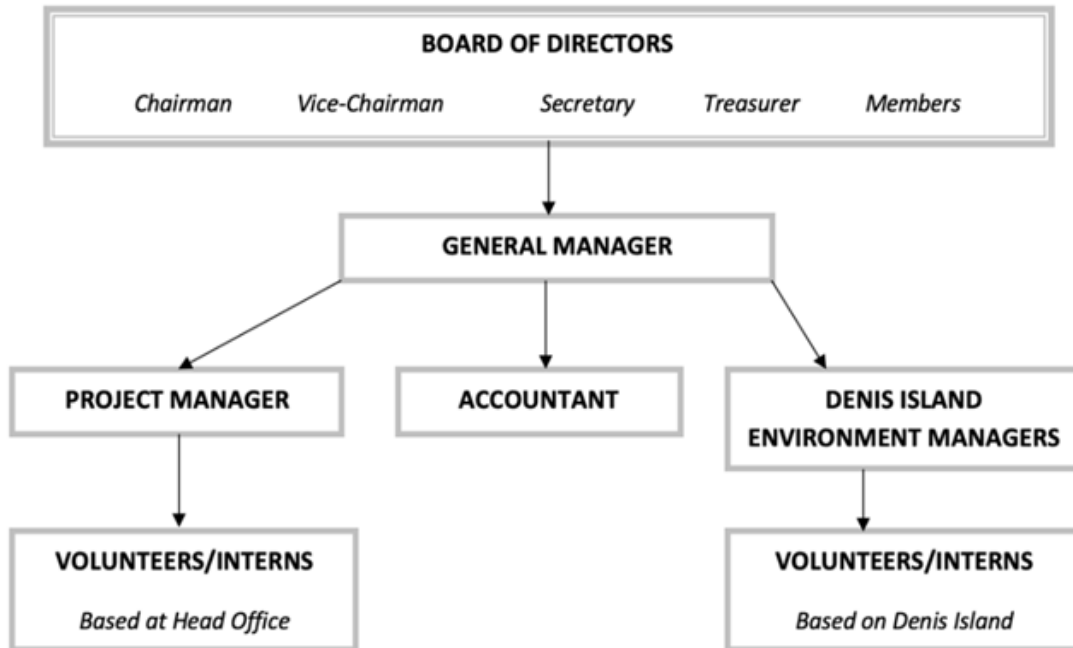


Figure 4. Green Island Foundation Organigram



## 5.2. Protected area governance

Roles and responsibilities of all players including Government, management bodies, other relevant initiatives and organisations, stakeholders are as follows:

### **Denis Private Island**

In line with the Nature Reserves and Conservancy Act 2022<sup>17</sup> in their capacity as the entity managing the area, DPI shall have the following suggested roles and responsibilities as per the Nature Reserve and Nature conservancy Act (2022) within the Protected Area:

#### *Support for Effective Administration and Management:*

- Providing administrative support for the Protected Area's day-to-day operations.
- Designating officers responsible for Protected Area management.
- Conducting independent financial audit of the protected area.

#### *On-Site Management, Surveillance, and Enforcement:*

- Ensuring continuous on-site management and monitoring.
- Collaborating with GIF and relevant authorities to enforce regulations.

#### *Ensuring Long-Term Sustainable Financing:*

- Developing and implementing financial strategies for the management of the Protected Area.
- Exploring funding sources and partnerships to sustain PA management.

#### *Development of Economic Opportunities in the Protected Area:*

- Identifying and promoting sustainable economic opportunities within the Protected Area.
- Supporting businesses and initiatives that align with conservation objectives.

#### *Access to the Protected Area:*

- Enforcement access and restriction in collaboration with relevant authorities, including Coast Guards; (see section Access to the DIMSUA and Annex 3. Surveillance, Patrol, and enforcement Strategy).
- Ensuring that visitors and stakeholders comply with access regulations.

#### *Use of Biological Resources in the Protected Area:*

- Management of fisheries sector in compliance with sustainable fishing practices.

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<sup>17</sup> Nature Reserves and Conservancy Act, 2023 (<https://faolex.fao.org/docs/pdf/sev208781.pdf>). Accessed 16 Feb 2024

## **Green Islands Foundation**

In their capacity as the dedicated environmental non-governmental organisation (NGO) working with DPI, the Green Islands Foundation's (GIF) suggested roles and responsibilities as per the Nature Reserve and Nature conservancy Act (2022) within the Protected Area are to:

*Development of Economic Opportunities:*

- Collaborating with DPI to identify and develop sustainable funding projects.
- Assisting in the development of project proposals and securing grant funding.

*Development of Local Management Capacity:*

- Providing training and knowledge exchange programs for local stakeholders.
- Supporting capacity building initiatives to enhance conservation efforts.

*Scientific and Administrative Data Management:*

- Collecting, maintaining, and sharing scientific and administrative data relevant to the Protected Area.
- Preparing annual reports on Protected Area management.

*Science and Monitoring Activities:*

- Implementing scientific research and monitoring programs to assess biodiversity and ecosystem health.
- Sharing findings and recommendations with all Parties for informed decision-making.
- Education and Awareness Campaigns:
  - Leading educational initiatives and awareness campaigns to promote conservation.
  - Engaging with the local community and visitors to foster understanding and support.

*Staffing - Conservation:*

- Coordinating volunteer programs and conservation initiatives within the Protected Area.

## **Ministry of Agriculture Climate Change and Environment (MACCE)**

In their interim mandate as the legal and supervisory entity, the Ministry of Agriculture, Climate Change and Environment (MACCE), through the interim SMSP Unit shall provide facilitation and oversight to ensure the effective implementation of this management plan through the modalities defined in the co-management agreement. This includes, reviewing progress, and ensuring compliance with relevant laws and regulations. This role be taken up by the SOA once the Authority is enacted.

## **Seychelles Coast Guard (SCG)**

The Seychelles Coast Guard (SCG) is a branch of the Seychelles People's Defence Forces. It is a maritime, military, multi-mission service. SCG acquired responsibility for search and rescue for vessel incidents as well as environmental protection in Seychelles waters. In this capacity they will serve their mandate for enforcement for any breach of the law within the DIMSUA.

## **National Information Sharing and Coordination Centre (NISCC)**

The NISCC’s mandate is to coordinate and manage the ever-increasing level of activities within the maritime sector, such as to provide sufficient maritime security necessary for sustainable development of the blue economy sector in Seychelles. NISCC is also responsible for operating the Joint Rescue Coordination Centre (JRCC), coordinating oil spills and responses to coastal maritime crime, as well as operating the coastal radio station. NISCC serves as a first point of contact and as the centre of maritime security operations for key national stakeholders. In this regard they will provide Monitoring, Control and Surveillance support for the DIMSUA.

### **Seychelles Fishing Authority (SFA)**

The mandate of the Seychelles Fishing Authority (SFA) revolves around fostering the sustainable development of the fisheries sector, ensuring effective governance, and maximizing the socio-economic benefits derived from fisheries resources while safeguarding their long-term viability. In this mandate fisheries management in the DIMSUA is primarily the responsibility of the Seychelles Fishing Authority (SFA), with management implemented through Fisheries Regulations, license conditions and fisheries management plans.

## **6. Sustainable Use Area Description**

The Denis Island Sustainable Use Area covers a marine area of 29.65 Km<sup>2</sup> and is from the high tide line on Denis Island to the boundary of the area. The island is 1.36 Km<sup>2</sup> in size. Denis is one of the two carbonate islands within the Inner Islands system and stands as a low-lying cay<sup>18</sup>. Denis Island sits atop a coral-derived plateau extending northward from the boundaries of the SMSP Area. Notably, the shallow area between 0 to 10 m constitutes 37.64% of the total area, encompassing critical habitats such as the reef flat along Denis Island's eastern coast and extensive seagrass beds. The area is relatively shallow, with a maximum depth recorded of 53 m, and an average depth of 22.2 m.

### **6.1. History**

The table below outlines the significant historical milestones in the development of Denis Island and its transition into a Sustainable Use Area:

1773	Denis Island was discovered in August 1773 by Jean François Sylvestre Denis de Trobriand, a French navy officer in command of the Etoile. At that time, Denis Island was uninhabited, showing no signs of prior human occupation.
1815	The island was leased to Captain Lesage, presumably for fishing and turtle harvesting, although historical records of this period are scarce.
1906	W.F. Stephen conducted the first report on the guano deposits of Denis Island, noting them to be more extensive than those found on Bird Island but still untouched.

<sup>18</sup> Cazes-Duvat, M. V., Paskoff, M. R., & Durand, M. P. (2002). Denis et Bird Recent evolution of the two coralline islands of the Seychelles Bank (western Indian Ocean): Denis and Bird. *Géomorphologie: relief, processus, environnement*, (3), 211-222.

1929	Serious excavation of the guano did not commence until 1929, with a total export of 16,195 tons, primarily between 1929 and 1934. Following the conclusion of guano extraction, coconut palms were swiftly planted across the entire island, although the specifics of who planted them remain unclear.
Early 1960s	Donkeys, pigs, and poultry had been introduced to the island
1975	Denis Island was purchased by Mr. Pierre Burkhardt, a French industrialist, who carved out an airstrip, paving the way for the opening of a small tourist hotel in 1978.
1996	Denis Island was purchased by the Mason's and managed as a luxury eco-tourism retreat by Denis Island Private Pty.
2002	Cats ( <i>Felis catus</i> ) and black rats ( <i>Rattus rattus</i> ) were eradicated from the island.
2006	The Green Island Foundation was established to promote the mainstreaming of sustainable development.
2004 and 2008	Four endemic bird species were translocated to Denis Island to establish insurance populations.
2010-2015	Common mynas ( <i>Acridotheres tristis</i> ) eradication
2011	The first Coral and Fish Survey by the Green Island Foundation for the MFF/IUCN LGF Project: Coastal Development and Ecosystem Modelling.
2014	Mapping the ecological zone of the marine environment surrounding Denis Island by Bluemel (2014) <sup>19</sup> based on ReCOMAP project (2009-2010).
2014-2023	Biannual to annual marine monitoring was conducted by the Green Islands Foundation
2020	Denis Island (Marine) gazetted as Area of Outstanding Natural Beauty, under the National Parks and Nature Conservancy Act, GoS.
2023	Denis Island (Marine) reclassified as (Marine) Sustainable Use Area, Under Nature Reserves and Conservancy Act, 2022, GoS;
2024	Development of the first Denis Island Marine Sustainable Use Area Management Plan

## 6.2. Geography & surrounding features

Denis Island is situated as one of the northernmost islands of the Seychelles, lying approximately 90 kilometres north of Mahé, the largest of the granitic Seychelles, at the northern edge of the Mahé Plateau. Resting upon a coral-derived plateau that extends northward from the boundaries of the protected area, Denis Island is relatively remote compared to the granitic islands to the south. The nearest island, Bird Island, is approximately 50 kilometres to the west, composed of coralline formations. The closest large island in the granitic group is Praslin, located 54 kilometres to the

<sup>19</sup> Green Island Foundation, 2014, Marine Survey Report for Denis Island, GEF-UNDP, 27p.

south. Although the Denis Island Sustainable Use Area lies within the Amiranter to Fortunes Bank Sustainable Use Area, it is managed as a separate block.

### 6.3.Values

#### 6.3.1. Ecosystem and habitat

A comprehensive analysis, integrating data from the ReCOMAP project (2014) and recent bathymetric surveys (Figure 5) and georeferenced photo quadrats analysis, delineates the predominant zones subdivided into 5 Ecological Zone including 1) an expansive sublittoral region, 2) extensive seagrass beds, 3) Sand Banks, 4) Reef flat and 5) Fore Reef (Figure 6; Figure 7; Table 1; Table 2).

Table 1 Distribution of marine area by depth isobath (m) around Denis Island

Depth isobath (m)	Km <sup>2</sup>	% Total Marine Area
0-5	4.66	15.71
5-10	6.50	21.93
10-15	3.33	11.22
15-20	1.10	3.70
20+	14.07	47.44
TOTAL	29.65	100.00

Table 2. Distribution of marine ecosystem zones around Denis Island, with corresponding areas in square kilometres (Km<sup>2</sup>) and percentage of the total marine area

Zone	Km <sup>2</sup>	% Total Marine Area
Reef Flat	0.73	2.45
Fore Reef	2.94	9.93
Sand Banks	3.75	12.66
Seagrass Bed	7.20	24.29
Sublittoral	15.02	50.67
Denis Marine Sustainable Zone	29.65	100.00
Denis Island	1.36	
TOTAL	31.01	

#### Sublittoral (Depth 20 m+)

The Sublittoral is the dominant oceanic zone, comprising 50.67% of the total area. Recent drop camera surveys conducted in 2023 within this zone revealed two primary habitat types: sandy bottoms and rubble beds. Sandy bottoms are characterized by fine sand with limited visible presence of flora and fauna. Taxa recorded include Antipathidae, Holothuroidea, and a species of seagrass, *Halophila sp.*, observed at a depth of 37 m. The rubble bed habitat consists of scattered

rubble on a coarse sandy bottom. This habitat typically hosts macroalgal beds with varying densities. While several species of macroalgae were observed, only one species, identified as *Halimeda sp.*, was classified to the genus level and was the most dominant. Among the fauna observed within the macroalgae were Asteroidea, *Culcita sp.*, and Alcyonacea (soft coral). Additionally, a few individual colonies of Scleractinia (hard coral) and several reef-associated species such as Acanthuridae & Chaetodontidae were also recorded.

#### Sand banks and beach

The shallow sand banks within the DIMSUA are characterized by fine sediment and coral rubble, with seagrass being scarce in this zone. During Baited Remote Underwater Video (BRUV) analysis, the most abundant species identified were *Caesio xanthonota*, a fusilier, *Lutjanus gibbus*, known as the Terezi, and rabbit fish species (*Siganus sp.*). Furthermore, while the beaches on Denis Island represent a smaller proportion of the DIMSUA, they serve critical ecological functions as nursery grounds for various marine organisms. The presence of nesting sites on Denis Island's beaches, coupled with the utilization of adjacent seagrass meadows as nursery habitat for juvenile Hawksbill Turtles, emphasizes the interconnectedness of different habitats within the marine ecosystem in the zone boundary.

#### Seagrass bed and Reef flat

Seagrass beds constitute a vital component of the oceanic ecosystem surrounding Denis Island, covering approximately 7.2 km<sup>2</sup> of the shallow coastal seabed and forming the most dominant habitat (24.29 %). Seagrass beds thrive particularly inside the reef flat on the eastern coast of Denis. Extensive and dense meadows dominated by *Thalassodendron ciliatum* and *Thalassia hemprichii* support a significant biodiversity. This ecosystem is providing critical habitat, feeding grounds and nursery area for various marine species, including the endangered green turtles, the critical endangered hawksbill turtle and several threatened species of shark. Additionally, seagrass beds play a crucial role in sediment stabilization, carbon sequestration, and nutrient cycling, enhancing the resilience of Denis Island coastal ecosystems to climate change and anthropogenic impacts.

#### Fore Reef and Coral Reef

The Fore Reef encompasses most of the slope extending from the coralline plateau to the deeper areas and sublittoral of the DIMSUA. Recent marine monitoring surveys indicate decline in coral cover and overall benthic community health in the area likely attributable to various factors. Evidence of extensive coral mortality was observed during the surveys, with numerous large dead colonies and signs of mortality among smaller corals. The highly eroded state of the coral skeletons suggests mortality events, possibly linked to the 2016 mass coral mortality event that affected the western Indian Ocean. Additionally, older rubble beds may result from the 1998 bleaching event.

Despite these challenges, the coral reefs surrounding Denis Island retain significant ecological importance, supporting diverse marine life including reef fish, invertebrates, and iconic species such as green turtles. Notably, historical data analysis reveals a distinct trend in coral cover at the House Reef, a shallow patch reef located on the island's west coast. Unlike other sites affected by bleaching

events, the House Reef consistently maintained an estimated coral cover of over 20% annually. Dominated by resilient coral species such as *Porites sp.*, *Isopora palifera*, and *Pavona sp.*, this zone demonstrates robust structural integrity and the potential for high resilience to environmental stressors.

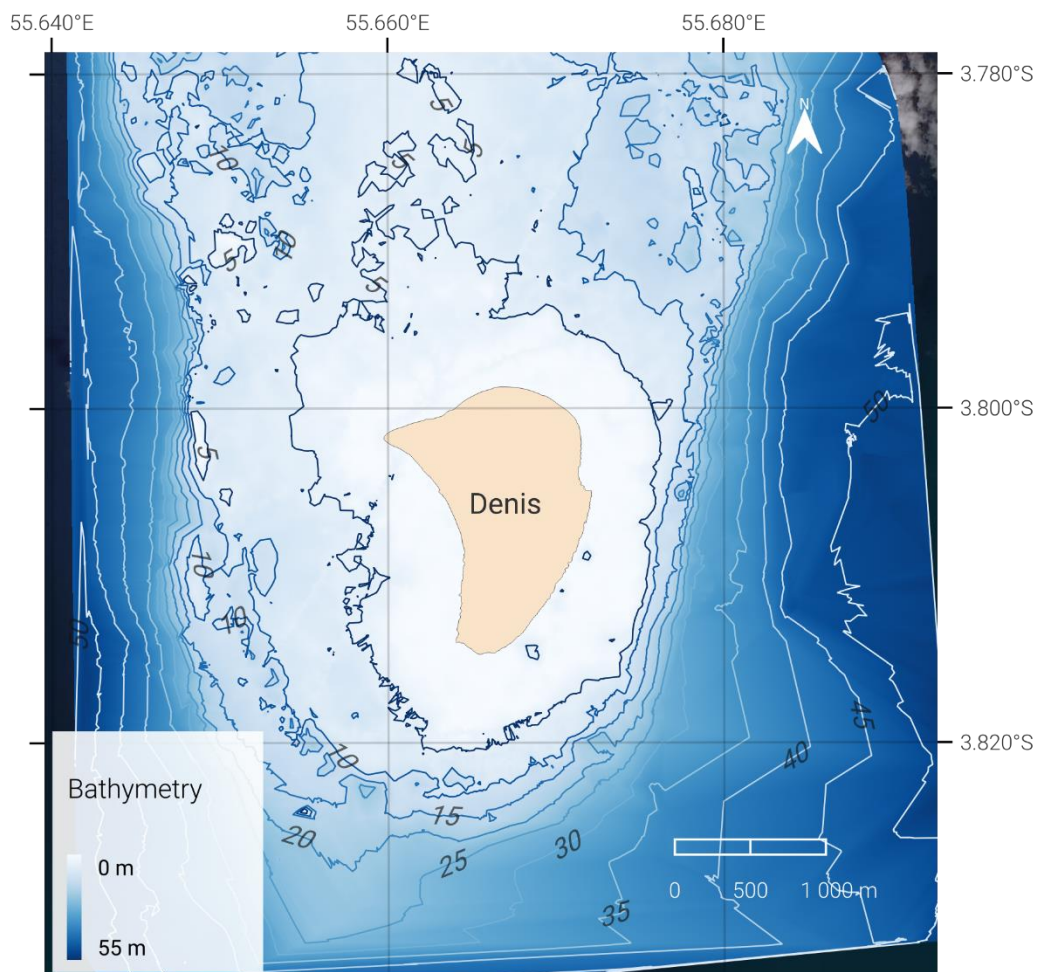


Figure 5. Bathymetric map of DIMSUA<sup>20</sup>

<sup>20</sup> Green Island Foundation, 2024, Denis Island Marine Sustainable Use Area baseline survey report, SeyCCAT-Ocean 5, 59p.



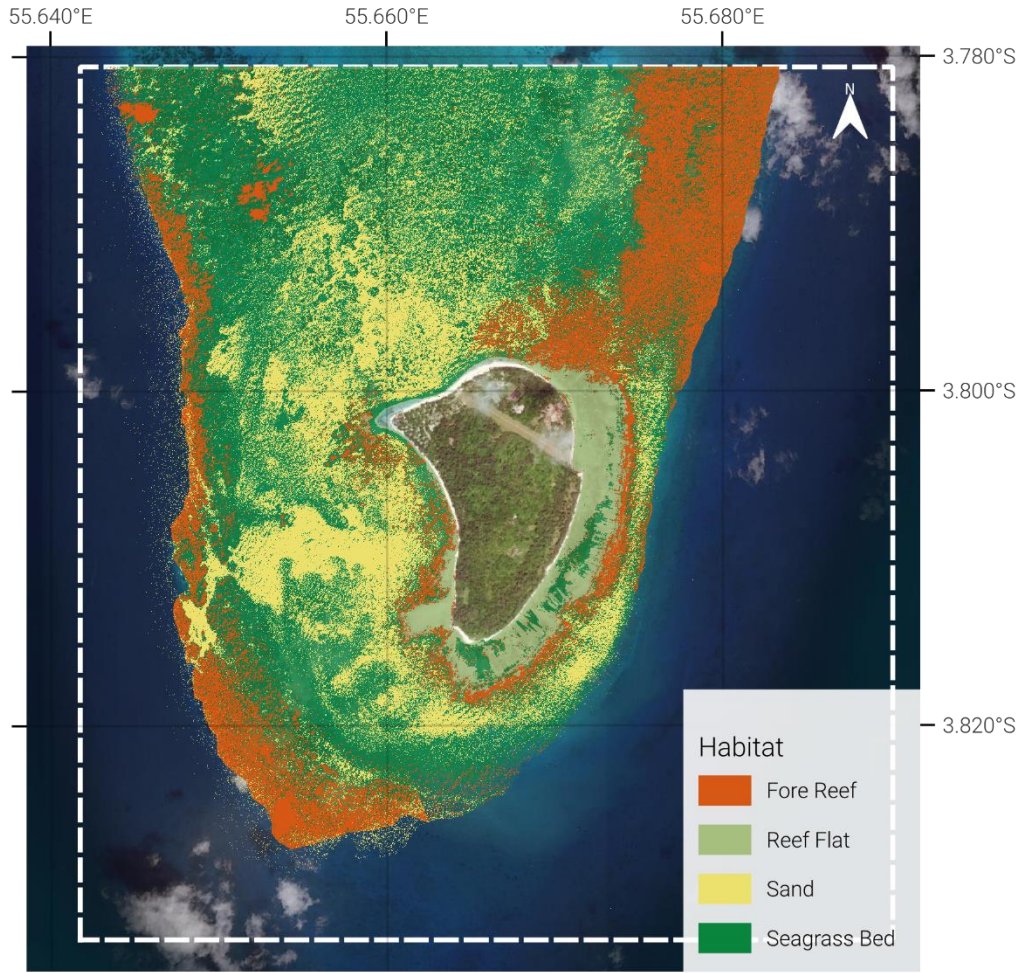


Figure 6. Marine habitat features within the Denis Island marine SUA, modified from GIF survey Report 2014.<sup>21</sup>

<sup>21</sup> Green Island Foundation, 2024, Denis Island Marine Sustainable Use Area baseline survey report, SeyCCAT-Ocean 5, 59p.

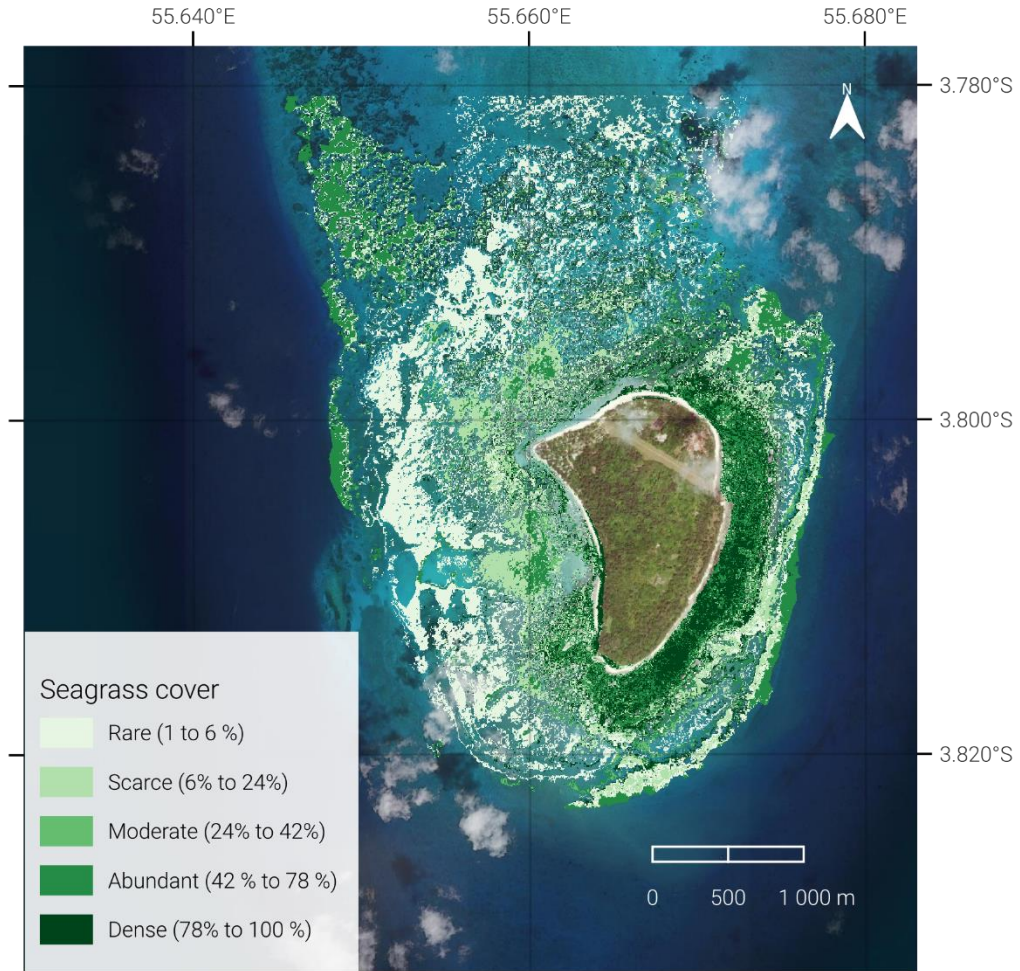


Figure 7. Estimated seagrass cover in the 0-10 m depth around Denis Island<sup>22</sup>

<sup>22</sup> Green Island Foundation, 2024, Denis Island Marine Sustainable Use Area baseline survey report, SeyCCAT-Ocean 5, 59p.

### 6.3.2. Species of concern

A recent assessment of marine species diversity within the Denis Island Sustainable Use Area has identified several taxa warranting conservation attention<sup>23</sup>. A total of 413 marine species records have been documented and classified under IUCN global category.

Two species, *Eretmochelys imbricata* or Kare and *Rhina ancylostoma* or Gitar are classified as critically endangered.

Six species, namely Spotted Eagle Ray (*Aetobatus ocellatus*), Grey Reef Shark (*Carcharhinus amblyrhynchos*) Sicklefin Lemon Sharks (*Negaprion acutidens*), Whale Shark (*Rhincodon typus*), Napoleon Wrasse (*Cheilinus undulatus*), and Green Turtle (*Chelonia mydas*) are Endangered.

One species of hard coral, (*Isopora palifera*) and one species of fish, Chevroned butterflyfish (*Chaetodon trifascialis*) are listed as Near Threatened.

Five Elasmobranchi, Porcupine Ray (*Urogymnus asperrimus*), Blacktip Reef Sharks (*Carcharhinus melanopterus*), Tawny Nurse Sharks (*Nebrius ferrugineus*), Spinner Sharks (*Carcharhinus brevipinna*), and Whitetip Reef Sharks (*Triaenodon obesus*); the Bumphead parrotfish (*Bolbometopon muricatum*) and the Pearl bubble coral (*Physogyra lichtensteini*) are listed as Vulnerable. The latter is also an Evolutionarily Distinct and Globally Endangered (EDGE) species, or more precisely a species which have an above average evolutionary distinct (ED) score and are threatened with extinction.

Table 3. List of IUCN conservation categories and associated species recorded in the DIMSUA.

IUCN Category	Class	Species
<b>Critically Endangered</b>	Elasmobranchii	<i>Rhina ancylostoma</i>
	Reptilia	<i>Eretmochelys imbricata</i>
<b>Endangered</b>	Elasmobranchii	<i>Aetobatus ocellatus</i>
		<i>Carcharhinus amblyrhynchos</i>
		<i>Negaprion acutidens</i>
		<i>Rhincodon typus</i>
	Osteichthyes	<i>Cheilinus undulatus</i>
	Reptilia	<i>Chelonia mydas</i>
<b>Vulnerable</b>	Anthozoa	<i>Physogyra lichtensteini</i>
	Elasmobranchii	<i>Carcharhinus brevipinna</i>
		<i>Carcharhinus melanopterus</i>
		<i>Nebrius ferrugineus</i>
		<i>Pastinachus ater</i>
		<i>Triaenodon obesus</i>
		<i>Urogymnus asperrimus</i>
	Osteichthyes	<i>Bolbometopon muricatum</i>
	<i>Epinephelus polyphkadion</i>	
<b>Near Threatened</b>	Anthozoa	<i>Isopora palifera</i>
	Osteichthyes	<i>Chaetodon trifascialis</i>

<sup>23</sup> Green Island Foundation, 2024, Denis Island Marine Sustainable Use Area baseline survey report, SeyCCAT-Ocean 5, 59p.

## Elasmobranch: Shark and Rays

Sharks and rays are of significant conservation importance for the DIMSUA. During the 2022/2023 BRUV campaign eight elasmobranch species were observed, underscoring the importance of understanding their diversity, abundance, and spatial distribution in the DIMSUA. The most abundant species was the Grey Reef Shark (*Carcharhinus amblyrhynchos*), with 31 individuals sighted across 18 samples. Additionally, the Blacktip Reef Shark (*Carcharhinus melanopterus*) and the Tawny Nurse Shark (*Nebrius ferrugineus*) were also prominently present. It is worth noting that on the Mahe plateau, Denis is one of the last places where Blacktip Reef Shark (*Carcharhinus melanopterus*) can still be reliably found. The population of this species on the Mahe plateau has collapsed likely due to anthropogenic impacts the very shallow water, habitats of its juveniles. The relative abundance analysis further highlights hotspots, particularly in the northern parts, where the Grey Reef Shark is most prevalent. Given the IUCN statuses of the observed species, these findings emphasize the urgent need for targeted conservation efforts to safeguard elasmobranch populations within the DIMSUA.

## Turtles

Hawksbill and Green turtles are a focal species within the DIMSUA. The report by Dr. Jeanne A. Mortimer, highlights the analysis of turtle data collected from 2002 to 2016, shedding light on the population dynamics and nesting behaviours of these species. Minimum population estimates derived from extensive surveys during the peak nesting seasons reveal the significance of Denis Island as a critical habitat for both Hawksbill and Green turtles. The Hawksbill nesting season mirrors patterns observed elsewhere in Seychelles, peaking from October to January, with the highest nesting activity in November-December. Conversely, Green turtles exhibit year-round nesting, with a peak from April to September, reaching its zenith in May.

Geographic distribution studies indicate widespread nesting activity around Denis Island's beach perimeter, with Hawksbills favouring the NE coast and specific regions on the south end's east and west coastlines, while green turtles predominantly nest along the SW coast. The implementation of a streamlined and rigorous monitoring protocol aims to enhance stewardship of DIMSUA's turtle resources, emphasizing the importance of accurate data collection and conservation efforts to safeguard these species of concern.

## Cetaceans

DIMSUA is one of WIOMER Globally Outstanding Proposed Priority Seascape and Site, and it covers 100% of the area. Many species of cetacean have been recorded in the area, which includes but not limited to Brydes whale (*Balaenoptera brydei*), Dwarf sperm whale (*Kogia sima*), False killer whale (*Pseudorca crassidens*), Fin whale (*Balaenoptera physalus*), Pygmy sperm whale (*Kogia breviceps*), Risso's dolphin (*Grampus griseus*), Short-finned pilot whale (*Globicephala macrorhynchus*) and Blue whale (*Balaenoptera musculus*). The area also a known breeding area for the Blue whale.

## Seabirds

Denis Island has been identified as one of BirdLife Important Bird Area and several species of seabird nest on the island. Dr. Chris Fear conducted an inventory in July 2023 whereby non-breeding individuals of Frigatebirds (*Fregata sp.*), Red-billed Tropicbird (*Phaethon aethereus*), Crested Tern (*Thalasseus bergii*), Bridled Tern (*Onychoprion anaethetus*), Sooty Tern (*Onychoprion fuscata*) was recorded. Breeding pairs of Wedge-tailed Shearwater (*Ardenna pacifica*), White-tailed Tropicbird (*Phaeton lepturus*), White Tern (*Gygis alba*), Brown Noddy (*Anous stolidus*); Lesser Noddy (*Anous tenuirostris*)<sup>24</sup>. There are also records of the presence of Brown Booby, Masked Booby, Red-footed Booby (GoS-UNDP-GEF) in the area.

### 6.3.3. Social and cultural

The DIMSUA attracts tourists and visitors interested in activities such as snorkelling, diving, and eco-tourism. Multiple yacht charter options offer visits to this area, including diving excursions. Additionally, the private resort on the island operates its own dive centre and offers high-quality services to guests.

Moreover, through the collaborative framework developed by the Green Islands Foundation the marine area serves as a platform for education and awareness-raising initiatives focused on marine conservation and sustainability. Universities, local organizations, and international researchers have the opportunity to conduct educational programs and research projects centred on marine ecology, biodiversity, and environmental stewardship.

Furthermore, the natural beauty of the marine environment, characterized by pristine beaches, clear waters, and diverse marine life, serves as a source of inspiration for creativity, artistic expression, and cultural appreciation among Seychellois and visitors alike. Notably, artists like Derek Hare, a seascape painter, find inspiration in the Denis shoreline, with his works commanding prices of up to \$16,000.

### 6.3.4. Economy

The Denis Island Sustainable Use Area serves as a hub for two primary economic activities: tourism and commercial fisheries. Moreover, the area serves as a safe harbour for fishermen, ensuring their safety during adverse weather conditions. Additionally, the presence of limited seismic surveys conducted in waters near Denis Island indicates its proximity to active and expired petroleum exploration license blocks held by PetroSeychelles. This underscores the significance of implementing sustainable management practices to harmonize economic development with environmental conservation efforts.

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<sup>24</sup> Green Island Foundation, 2023, Report on seabird status on Denis Island, WildWings Bird Management, 4p.

## Tourism activities

Tourism activities, including snorkelling, diving, and fishing excursions, are offered both by the hotel on the island and by yacht charters. Denis Island hosts a privately-owned holiday resort that provides luxurious eco-retreat accommodation, attracting visitors seeking a sustainable and high-end vacation experience. The resort comprises 23 villas and employs 80 – 100 people on-island. DPI is more than a luxury resort; its core intent is rooted in its vision to be a self-sustainable refuge preserved for future generations. Over the past 18 years, DPI has promoted a sustainable tourism framework, investing in conservation alongside sustainable development and has invested heavily in rehabilitating the island's ecosystems.

## Fisheries

Sport fishing and artisanal fishing activities occur in the surrounding waters, contributing to the local economy and providing livelihoods for fishermen. Historically, artisanal practices such as lobster and sea cucumber harvesting have been prevalent in the area, although the level of activity has decreased over time. Spiny lobster is traditionally targeted on the west coast of the reef flat ( Figure 6) and represents the primary opportunity licensed fishermen with small boats and outboard engines due to its high value.

Denis Private Island (DPI) has its own boat and crew, offering opportunities for hotel guests to participate in Sport and Game Fishing. Game Fishing near Denis Private Island is renowned as one of the best locations in the world to target black marlin<sup>25</sup>. Targeted species include Blue Marlin (*Makaira nigricans*), Black Marlin (*Istiompax indica*), Striped Marlin (*Kajikia audax*), Sailfish (*Istiophorus platypterus*), Yellowfin Tuna (*Thunnus albacares*), Wahoo (*Acanthocybium solandri*), Dorado (*Coryphaena hippurus*), Dogtooth Tuna (*Gymnosarda unicolor*), Barracuda (*Sphyraena barracuda*), Grouper (*Epinephelus spp.*), Snapper (*Lutjanus spp.*) and Giant Trevally (*Caranx ignobilis*). Shore-based and blue-water fly-fishing is available on the island, particularly targeting Bonefish and the snubnose pompano (*Trachinotus blochii*).

### 6.3.5. Research and Education

Marine research around Denis Island, led by the Green Islands Foundation, encompasses extensive marine monitoring efforts conducted at various spatial scales and frequencies, involving collaboration among governmental bodies, the private sector, and non-governmental organizations (NGOs). These monitoring activities track multiple ecological indicators, including benthic cover, turtle and shark abundance, turtle nesting seasons, and fish community abundance and density. However, despite the wealth of data collected, no peer-reviewed publications have emerged from these efforts, with findings primarily disseminated through technical reports.

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<sup>25</sup> White, S. (2017) The Stunning Seychelles - Chasing black marlin in the Indian Ocean, available online; URL: <https://www.marlinmag.com/seychelles-marlin-offshore-fishing/>

The peer reviewed publications showcase that research activities have encompassed a range of ecological and conservation-focused investigations. Feare *et al.* (2017)<sup>26</sup> conducted research on the eradication of common mynas (*Acridotheres tristis*) from Denis Island, Seychelles, as a pest management strategy, highlighting efforts to mitigate the impact of invasive species on local ecosystems. Similarly, Feare *et al.* (2015)<sup>27</sup> explored the attempted re-establishment of a Sooty tern (*Onychoprion fuscatus*) breeding colony on Denis Island, contributing to conservation evidence and strategies for preserving avian biodiversity. Additionally, Duvat *et al.* (2002) investigated the recent evolution of coral islands within the Seychelles Bank, including Denis Island, providing insights into geomorphological processes and environmental dynamics in the region. Other studies, such as those by Stoddart and Fosberg (1981)<sup>28</sup> and Shah (2001)<sup>29</sup>, have addressed broader ecological and conservation challenges, including the eradication of alien predators and the characterization of avian populations. Furthermore, Feare *et al.* (2015)<sup>30</sup> examined iris color and pattern variations in common mynas on Denis Island and North Island, contributing to ornithological research and understanding avian biology in island ecosystems.

Ebrahim *et al.* 2020<sup>31</sup> reveals the diurnal nature and limited nocturnal movements of heavily targeted rabbitfish, *Siganus sutor*, around Denis island indicating its potential role as a mobile link between coral patches and seagrass meadows.

Recently the result from Stafford *et al.* 2023<sup>32</sup> results demonstrate that blue whales are heard seasonally in the Seychelles, primarily from December to April (the northeast monsoon period) near Denis Island.

#### 6.3.6. Other values

Beyond ecological, economic, and cultural significance, the marine ecosystem of Denis Island holds intrinsic value for biodiversity conservation, ecosystem services, and climate resilience. Preservation of these values is essential for maintaining the integrity and resilience of the marine environment in the face of anthropogenic pressures and climate change.

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<sup>26</sup> Feare, C. J., van der Woude, J., Greenwell, P., Edwards, H. A., Taylor, J. A., Larose, C. S., ... & de Groene, A. (2017). Eradication of common mynas *Acridotheres tristis* from Denis Island, Seychelles. *Pest Management Science*, 73(2), 295-304.

<sup>27</sup> Feare, C. J., French, G. C., Nevill, J. E., Pattison-Willits, V. S., Wheeler, V., Yates, T. L., ... & Prescott, C. (2015). Attempted re-establishment of a sooty tern *Onychoprion fuscatus* breeding colony on Denis Island, Seychelles. *Conservation Evidence*, 12, 19-24.

<sup>28</sup> Stoddart, D. R., & Fosberg, F. R. (1981). Bird and Denis Islands, Seychelles. *Atoll Research Bulletin*.

<sup>29</sup> Shah, N. J. (2001). Eradication of alien predators in the Seychelles: an example of conservation action on tropical islands.

<sup>30</sup> Feare, C. J., Edwards, H., Taylor, J. A., Greenwell, P., Larose, C. S., Mokhoko, E., & Dine, M. (2015). Stars in their eyes: iris colour and pattern in Common Mynas *Acridotheres tristis* on Denis and North Islands, Seychelles. *The Bulletin of the British Ornithologists' Club*, 135, 61-68.

<sup>31</sup> Ebrahim, A., Bijoux, J. P., Mumby, P. J., & Tibbetts, I. R. (2020). The commercially important shoemaker spinefoot, *Siganus sutor*, connects coral reefs to neighbouring seagrass meadows. *Journal of Fish Biology*, 96(4), 1034-1044.

<sup>32</sup> Stafford, K. M., Boussarie, G., Caputo, M., Irvine, L., Laing, S., Nancy, E., ... & Kiszka, J. J. (2023). Acoustic detections and sightings of blue whales *Balaenoptera musculus* in the Seychelles, western tropical Indian Ocean (2020-2022). *Endangered Species Research*, 52, 203-208.

## 7. Current Use of the SUA

The DIMSUA is used for two main economic activities namely, tourism and commercial fisheries. Additionally, scientific research and monitoring programme are also implemented in the area by the Green Islands Foundation and its partners.

### 7.1. Fisheries

The DIMSUA lies within the Fishing by Foreign Vessels Prohibited Areas for industrial longline and purse seiners, thereby prohibiting industrial fishing activities in the area. The small-scale (i.e., semi-industrial) fishery in the DIMSUA focuses on catch of sea cucumbers, although efforts have significantly decreased since the 2022 ban on harvesting white teat fish, a shallow species heavily targeted in the area prior to the moratorium. Small-scale longline fishing that targets tuna and tuna-like species is authorized to fish in the area however they voluntarily operate on the drop-off. Some local some-scale longline vessels do use the DIMSUA for safe harbour should bad weather arise when they are operating on the nearby drop off. Other small-scale (i.e., artisanal fishing) takes place in the DIMSUA by medium-sized vessels locally known as whalers and schooners, and to a lesser extent, mini-Mahé with outboard engines. This fishery primarily targets demersal and semi-pelagic fishes using the hook and line technique. Although possible, there is no confirmation of trap fishing in the area. The area is renowned for its lobster populations, especially by fishers based in Praslin. Recreational and subsistence fishing is conducted by island residents, and visitors are permitted to engage in flyfishing with their own gear. The resort also offers fishing trips to guests. Sport fishing around the island by resort guest predominantly targets billfish and sharks, with release as the norm. Billfish are tagged before release, and only severely wounded or dead animals are brought ashore. An estimated 80% of billfish catches occur north of the island, with Sailfish and Wahoo dominating the 'Denis plateau' drop, while Marlin are predominantly caught on the 'Mahe plateau' drop-off.

The DIMSUA is part of the Mahé Plateau, thus necessitating the application of the Mahé Plateau trap and line fishery co-management plan (2020). Grounded in the principles of the Ecosystem Approach to Fisheries Management (EAF), the plan aims to ensure sustainable fishing practices while considering ecological, social, economic, and governance aspects. Key objectives include developing a co-management model, assessing performance, and establishing regulations consistent with the Fisheries Act of 2014. The Co-management Mahé Plateau Plan focuses on licensed artisanal and recreational fishing activities targeting demersal and semi-pelagic species within the defined Mahé Plateau area, encompassing the entire plateau and its deepwater slopes. Responsibility for implementing the plan lies with the Ministry for Fisheries and Agriculture, particularly through the Seychelles Fishing Authority (SFA). Development followed the EAF principles, emphasizing stakeholder consultation, with the intention to transition to a full co-management model in the future. This plan is vital for addressing current fishing challenges while ensuring the sustainability of marine resources for future generations.



## 7.2. Tourism and Recreation

Apart from fishing excursions the hotel offers other marine related activities such as snorkelling and SCUBA diving. On reef tourism in Denis is estimated to generate over \$270,000 per year<sup>33</sup>. The beaches on Denis are amongst the few away from the granitic islands that have tourism, in view of the presence of the luxury resort on the Island. Such beaches are associated with well over \$1 million of expenditure per year being driven by the natural beach<sup>33</sup>.

## 7.3. Maritime / industrial use

In the context of International Shipping the waters are listed as “Area to be Avoided” on British Admiralty Charts; IHO, meaning that the depth measurements are not accurate for large vessels or ships; only smaller vessels can safely navigate in this area. Transportation to and from the Island is done by air. There is no infrastructure such as Ports, Marinas, Wharves or Jetties but only a dedicated landing site for the cargo barge which visits the Island once a month. Smaller boats, used on the island for recreational activities, also beach in the same area. In terms of other marine structures, erosion barriers have been erected along the coast in front of the hotel. A tower with tidal gauge, often referred to as tsunami tower is present on the norther side of the Island. The Island operates a land-based desalination plant, which pumps water from the ground water table and the brine is discharged in the ground.

## 7.4. Non-renewable energy

There is one active petroleum exploration agreement signed in 2018 with Sub-Saharan Resources Ltd (SSRL) through its subsidiary companies SSR Seychelles Beta (PetroSeychelles, 2024)<sup>34</sup>. The SSLR – Area B is of 8,802 km<sup>2</sup> and encompasses the DIMSUA (Figure 8). The PetroSeychelles has voluntarily committed to avoid exploration within 5 KM of islands in Seychelles, which includes Denis Island, so there are waters within the boundary where exploration would not be undertaken (Figure 9).

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<sup>33</sup> The Nature Conservancy. 2022. Evaluation of Ecosystem Goods and Services for Seychelles’ Existing and Proposed Protected Area System’. MACCE and SWIOFish3 programme. The Nature Conservancy. 78 pages.

<sup>34</sup> PetroSeychelles 2024, Current Active Licenses: <http://www.petroseychelles.com/index.php/blocks-licensing/currently-active-licenses>

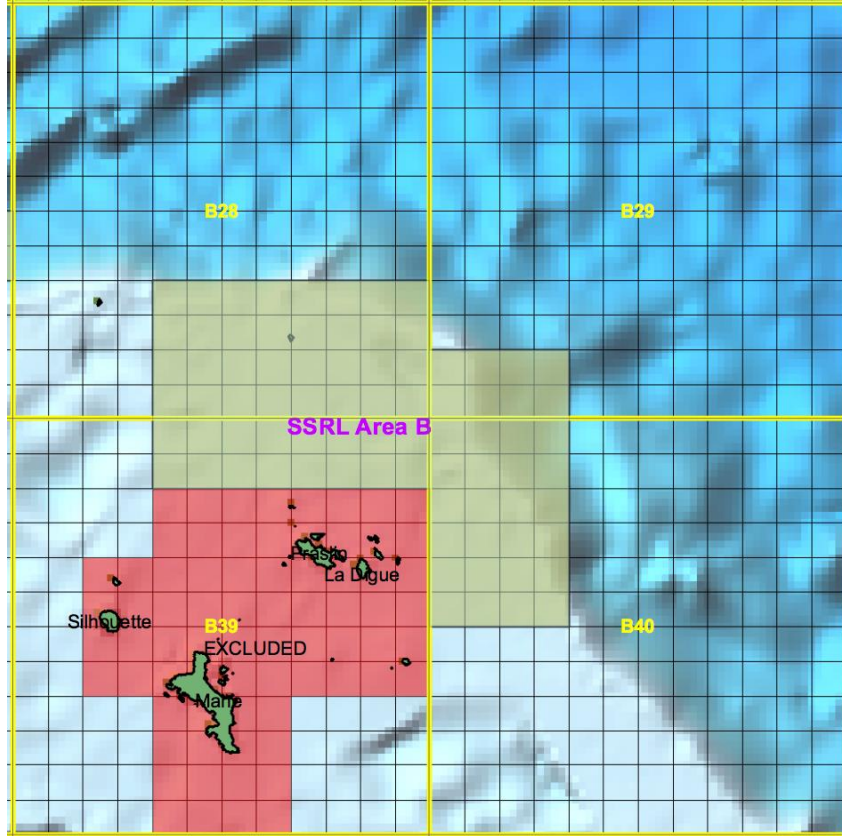


Figure 8. Map showing Denis Island position within the active license block SSRL Area B (PetroSeychelles, 2024)<sup>35</sup>

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<sup>35</sup> [http://www.petroseychelles.com/images/pdfs/license\\_map.pdf](http://www.petroseychelles.com/images/pdfs/license_map.pdf)



Figure 9. Image of the 5 KM voluntary buffer from Denis Island – PetroSeychelles. Source: Seychelles MSP Initiative, 2023

### 7.5. Research

Scientific research and monitoring are overseen by the Green Islands Foundation. The NGO has implemented a few marine targeted research but their focus has been on long term monitoring of species and their habitat.

The table below provides details on the present use of the DIMSUA in line with the draft SMSP Allowable Activity Table (Zone 2) (Nov 2023 version) before management plan implementation.

Table 4. Status of SMSP allowable activity before SMSP implementation

Activity	Status	Current Use in the DIMSUA
<b>FISHERIES</b>		
Aquaculture, Operational	Absent	Not presently undertaken
Aquaculture, Restorative	Absent	Not presently undertaken
Artisanal Fishing (small-scale fisheries)	Present	Mainly handline, hand gathering for lobster, octopus, demersal fish, and semi-demersal fish.
Fly Fishing, blue water	Present	As per Denis Island Factsheet; Authorised activity, if guest provided equipment. From stakeholder’s consultation the is no record of visiting vessel undertaking fly fishing.
Fly Fishing, lagoon	Present	As per Denis Island Factsheet; Authorised activity if guest provided equipment. From stakeholder’s consultation the is no record of visiting vessel undertaking fly fishing.
Industrial Pelagic Longline	Absent	Fishing by foreign vessel prohibited on the Mahé Plateau (Fisheries Act, 2014)

Industrial Purse Seine (free school)	Absent	Fishing by foreign vessel prohibited on the Mahé Plateau (Fisheries Act, 2014)
Industrial Purse Seine (associated schools)	Absent	Fishing by foreign vessel prohibited on the Mahé Plateau (Fisheries Act, 2014)
Industrial Purse Seine (supply vessel)	Unk	Supply vessels might enter the SUA for the retrieval of FADs and buoys, but no official record. FAD management plan
Recreational Fishing	Present	By Denis Island Resort, no confirmation if other local boats come for recreational fishing in the area
Semi-industrial Hand Gathering	Present	Denis is well known for white teat fish locally known as Kokosye blan which is a shallow species however there is a ban on this species since 2022, therefore fishing effort is much reduced in the area.
Semi-industrial Hook & Line (small-scale fisheries)	UnK	Data unavailable
Semi-industrial Longline (Small-scale fisheries)	Absent	Authorised but voluntarily fish on drop off and avoid the Mahe plateau. Some local boat uses the area for safe harbour only
Sport Fishing (small-scale fisheries)	Present	Offered as an activity by Denis Island resort. Guests are allowed to bring back their catch (excluding billfish) for consumption / Billfish are caught, tagged, and released. Only severely wounded or dead animals get landed. The drop off in the vicinity of DIMSUA is also popular amount sport fishers.
Subsistence Fishing	Present	For residents of Denis Island
<b>MARITIME INFRASTRUCTURE</b>		
Ballast and Bilge Dumping	Absent	Not authorised as minimum distance is 80 miles from Port
Bunkering at sea	Absent	No known activity requiring bunkering occurring in the area
Bunkering at sea, Fishing vessel	Absent	Fishing by foreign vessel prohibited on the Mahé Plateau (Fisheries Act, 2014), not expecting small vessel to be undertaking bunkering activity
Commercial shipping	Absent	None as per the British Admiralty charts No. 740 and 742.
Desalination, boat-based	Unk	Have not identified boat with desalination facility onboard which is using the area
Desalination, land-based	Present	By Denis Island for their daily operation
Dredging, coastal	Unk	to confirm if it is done for barge landing site
Ferries and Transportation	Absent	Transportation for client to and from Island is done by air
Ports, Marinas, Wharves, Jetties	Absent	Barge and Island based vessel land at specific beach site at the North of the Island
Renewable Energy, tidal	Absent	Infrastructure not present
Renewable Energy, wind (offshore)	Absent	Infrastructure not present
Renewable Energy, wave	Absent	Infrastructure not present
Underwater Cables	Absent	Infrastructure not present

Structure Marine Other	Present	Tsunami tower with tidal gauge North of the Island
<b>NON-RENEWABLE &amp; PROSPECTING</b>		
Bioprospecting Development	Absent	No bioprospecting work has been undertaken by DPI and GIF. Other projects are unknow
Petroleum Exploration, Drilling	Unk	As per the SEYMSP_ATLAS_Petroleum_Exploration_and_Interest_25March2020 Denis is within a block issued with a Petroleum exploration License (2018). Condition of license to be verified
Petroleum Development, Production, Extraction	Absent	SSRL – Area B: with 5Km buffer around Denis Island
<b>TOURISM &amp; RECREATION</b>		
Anchorage and Mooring Buoys	Present	The island-based boats have a dedicated mooring area to the north of the island. Two anchoring sites used by fisherman are known.
Motorised Activities, commercial	Present	DPI offer outings for guests including diving. Few others HC use the area e.g. for diving while on cruise on the plateau
Motorised Activities, non-commercial	Present	No known use of personal watercraft (e.g., jet skis) or hover crafts. A few private boats visit the area in calm season
Non-Motorised Activities, commercial	Present	Kayaking by visiting Hire Crafts (HC)
Non-Motorised Activities, non-commercial	Present	Snorkelling and kayaking by hotel guest
Cruise ships	Unk	Apart from yacht charters no known usage by cruise ship is known in the area
Tourism Accommodation, terrestrial	Present	Denis Island Resort; 23 chalets
<b>RESEARCH</b>		
Aquaculture, Research	Absent	No known aquaculture related research has been undertaken to date
Bioprospecting, Research	Absent	No known bioprospecting related research has been undertaken to date
Hydrographic Surveys	Present	By eCoast; For baseline survey 2022-2023 to collect bathymetry data
Scientific Geophysical Surveys, Research	Absent	No known geophysical survey related research is known to have been undertaken to date
Scientific Research and Monitoring	Present	Marine monitoring and surveys initiated by GIF

## 8. Management Context

### 8.1. Vision

Denis Island Marine Sustainable Area is recognised nationally and internationally as a model of sustainability achieving a harmonious balance between conservation and sustainable use by integrating ecotourism practices, sustainable fishing techniques, protection of threatened species and conservation of critical habitats.

### 8.2. Mission

To protect, conserve, restore and sustainably manage marine resources within the Denis Island Marine sustainable area.

### 8.3. Thematic scope & Key principles

The key principle is the implementation of DIMSUA area-based management guided by allowable activities metrics for the sustainable use area, mooring, and transportation corridor. In this context each area has dedicated allowable activities based on Seychelles Marine Spatial Planning list of activities. The list of draft allowable activities per area is available in Table 5 (Final for Approval – version 2.0.).

The implementation of the Management Plan is based on 4 main thematic scope and operational strategies including:

1. Finance: Innovative financing strategies are implemented to ensure sustainability of actions
2. Protect: Critical habitat and associated threatened species are protected
3. Restore: Sustaining the function of threatened species and critical habitats over time and space through monitoring and restoration efforts
4. Sustainable Use: Ensure sustainable use of marine resources for all users, including local communities, fishers, and tourists

Monitoring and Evaluation of the management plan is part of the operation and yearly financial and technical reports will consist of legal requirements of the co-management agreement. The operational strategies include the patrol, surveillance, and enforcement of the management strategies. The proposed Enforcement strategy provides more details (Annex 3. Surveillance, Patrol, and enforcement Strategy).

### 8.4. Pressure & threats

While the DIMSUA lies more than 60 Km away from the main inner granitic Island, which is the most anthropogenically impacted area in Seychelles, the Sustainable Use Area still faces pressure from various threat sources which includes:

**Ocean warming:** The coral reef habitat around Denis has been impacted by the increased Sea Surface Temperature (SST) and associated mass hard coral bleaching events in Western Indian Ocean. Coral reef monitoring data shows a decrease in live coral cover following bleaching events example in 2016. In recent years, several outbreaks of Harmful Algal Blooms (HABs) have also been

recorded in the Seychelles waters and the waters around Denis were affected. In 2015 and 2019 DPI recorded mass beaching of dead fish along the coast due to HABs.

**Introduction of Invasive Alien Species (IAS):** The introduction of Invasive Alien Species (IAS) poses a significant threat to the ecological integrity of Denis Island and DIMSUA marine ecosystem<sup>36</sup>. Vessels visiting Denis Island such as yacht charters and fishing vessels seeking safe harbour is one of the main point of entry for non-native species or invasive alien species (IAS). Denis Island has been rat free since 2002 and many critical species such as Magpie Robin, flycatcher have been re-introduced to the Island and are thriving in the absence of rats. Reestablishment of seabird colonies has also been observed as a result of the eradication. Re-introduction of rats would have a major impact on the terrestrial biodiversity. The water (Marine Protected Area) around Denis has been identified as the main point of entry of these IAS. This is via vessels with no biosecurity protocol in place when approaching the Island.

**Coastal erosion:** Coastal erosion on Denis Island is exacerbated by factors such as rising sea levels. This erosion threatens coastal habitats, including beaches, which serve as crucial breeding and nesting grounds for marine life and protect inland areas from erosion and flooding. Additionally, erosion can lead to loss of landmass and infrastructure directly impacting economy of the area.

**Poaching and Unsustainable fishing:** Poaching activities on Denis Island may include illegal hunting of endemic or protected species, such as seabirds, turtles, or other wildlife. Additionally, illegal fishing practices targeting valuable or endangered species for trade pose a threat to marine biodiversity. Poaching not only disrupts fragile ecosystems but also undermines conservation efforts and livelihoods dependent on sustainable resource use.

**Anchor damage:** Anchoring in sensitive marine environments such as coral reefs or seagrass beds can cause significant damage to these habitats. When boats drop anchor directly onto coral reefs, the heavy chain and anchor can break or crush corals, leading to physical destruction and fragmentation of the reef structure. This damage not only reduces the aesthetic value of the reef but also disrupts the complex ecosystem it supports, including fish nurseries and biodiversity hotspots.

**Marine Debris:** Marine debris around Denis Island consists of various materials, including plastics, fishing gear, and other waste products. This debris not only poses entanglement and ingestion hazards to marine animals but also releases harmful chemicals into the water, threatening ecosystem health. Moreover, marine debris accumulates on beaches and in coastal habitats, degrading scenic beauty, and impacting tourism, a vital economic activity for the region.

**Petroleum exploration:** Petroleum exploration near Denis Island raises concerns about potential oil spills and leaks, which can have devastating effects on marine ecosystems. Oil spills can contaminate water, coat marine animals, and disrupt food chains, leading to long-term ecological damage. Furthermore, exploration activities such as seismic surveys can disturb marine life,

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<sup>36</sup> Graham, N. A., Wilson, S. K., Carr, P., Hoey, A. S., Jennings, S., & MacNeil, M. A. (2018). Seabirds enhance coral reef productivity and functioning in the absence of invasive rats. *Nature*, 559(7713), 250-253.

including whales and dolphins, affecting their behaviour and migration patterns. It is to be noted that PetroSeychelles voluntarily implements a 5Km buffer from Islands, were such activities are not authorised (Figure 9).

To effectively respond to the various threats facing DIMSUA and ensure its sustainability, a comprehensive set of management strategies and activities have been proposed. These strategies aim to address innovative financing, habitat protection, monitoring and restoration efforts, equitable resource access, stakeholder engagement, and operational aspects such as enforcement and administration.



## 9. DIMSUA Management Strategies

### 9.1. Site zonation

The official boundary of the Denis Island Sustainable Use Area as gazetted comprise an area on the Mahé Plateau, with the boundary starting at the southwest corner Point 42 (UTM40, 349,175.37; 9,576,237.87), north to Point 43 (UTM40, 349,175.37; 9,582,007.33), east to Point 44 (UTM40, 354,549.16; 9,582,007.33), south to Point 45 (UTM40, 354,549.16; 9,576,237.87), then west back to Point 42, the point of commencement (S.I. 79 of 2023).

The total area covers 31 Km<sup>2</sup> of which 1.4 Km<sup>2</sup> corresponds to the Island and 29.6 Km<sup>2</sup> its surrounding water, with the High Water Mark (HWM) being the delimitation. It is being proposed for the Denis Island Sustainable Use Zone area to be entail designated mooring areas and Transportation corridors (Figure 10; Table 5).

#### Sustainable Use Area

The Sustainable Use area aims at maintaining a balanced relationship between humans and the rest of nature through implementation of ecosystem-based approach initiatives, sustainable eco-tourism, and best management practices for the use of the natural resources. To ensure the sustainable use of the resources it is recommended that specific research and monitoring activities are implemented on species exploited within this area to understand level of impact on these species and implement adaptive management measures as and when required.

Artisanal, recreational fishing and tourism activities are authorised. Management measures such as release policy for shark, rays and bill fish is not mandatory but recommended. Management strategies will be put in place to ensure resource sustainability and limit impact on the marine environment.

For biosecurity and safety reasons all vessels entering the sustainable use area are required to contact the Island via open channel to identify themselves and provide information on their activities in the area. Visitors wishing to access the Island are required to contact DPI head Office two weeks in advance as Prior Informed Consent is required.

In addition to the designated mooring areas, mooring is authorised solely on sandy bottom free of seagrass and corals in areas of > 5m depth.

Boats entering areas of < 5m depth should be less than 6 m in length and are required to observe the speed limitation of < 5 Knots to reduce ship generated waves (SGW) causing bank erosion, disturbance to moored boats and bad impact on marine environment. Personal watercraft should not operate within reef zones 150 m from high water mark as per international best practice.

#### Transportation Corridors

Transportation corridors aims to provide for safe access for all boats travelling to and from the island to avoid spatial overlap with other uses including ecotourism practices. This area will permit the dive boats to access the drop off and pick up area for clients of as well as the barge to land for

provisioning the island No mooring is allowed in the transportation corridors as it is in the aircraft flight path.

### Mooring Area

Mooring area is for boats of < 6 m entering 0-5 m depth and larger boats (> 6 m) entering via the transportation corridors in the 0-5 m depth. It will also serve as a mooring site for vessels seeking safe harbour during bad weather, visitors to the island as well as dive boats.

### 9.2. Access to the DIMSUA

The mandatory access protocol to the DIMSUA include:

1. Every boat entering the sustainable zone should contact the area manager via VHF to provide identification details and purpose of visit;
2. Personal watercraft (e.g., jet ski) use is conditionally allowed in this sustainable use area as per the relevant regulations (in development, SMSA);
3. Access to Denis Island needs to follow specific requirements including compliance with biosecurity measures and a prior informed consent is required from DPI;

### 9.3.Sustainable use allowable activities

In the DIMSUA, multiple activities are allowed. Table 5 below showcase the list of allowable activities, definitions and Area based management considerations.

Table 5. Proposed Allowable activities for the Denis Island Marine Sustainable Area based on the draft SMSP Zone 2 allowable activity matrix (Final for Approval – version 2.0.). C = Conditional; X= Prohibited. The List and Matrix of Conditions is available in Annex 4. MSP Zoning Design Codes for Allowable Activities

Sectors	Marine Activity	Definition	Zone 2	Area based management Considerations
Fisheries	Aquaculture Operational	An aquaculture license for any activity related to aquaculture production (“operational license”).	C 1,4,5,6,11,23	
	Aquaculture Restorative	An aquaculture licence for the purposes of undertaking environmental restoration activities involving aquaculture (“restorative licence”).	C 1,4,5,6,11,23	
	Artisanal Fishing (Small-scale 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. Draft Fisheries Act 2023 defines artisanal as ‘small-scale fisheries’ classes I-III	C 1,4,5,7,17	Authorised in compliance with fisheries management plans & Fisheries Act 2014 in Integrated management zone. Recommend the release of all bill fish and Sharks. Only severely wounded or dead animals get landed.
	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 like the conventional fishermen’s landing while Big Game Fishing	C 1,4,5,7,11	
	Fly Fishing, lagoon	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.	C 1,4,5,7,11	Catch and release using single barbless hook is recommended.
	Industrial Pelagic Longline	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	C 1,5,7,17	Fishing by foreign vessel prohibited on the Mahé Plateau (Fisheries Act, 2014)
	Industrial Purse Seine, free schools	Industrial purse seining is a method of fishing targeting tuna schools using purse seine nets.	C 1,5,7,17,22	Fishing by foreign vessel prohibited on the Mahé Plateau (Fisheries Act, 2014)
	Industrial Purse Seine, associated schools	Purse seine fishing on associated schools refers to all sets that involve natural floating objects, FAD.	C 1,5,7,17,22	Fishing by foreign vessel prohibited on the Mahé Plateau (Fisheries Act, 2014)
	Industrial Purse Seine, supply vessels	Support vessels or auxiliary vessels for purse seine that are not equipped with fishing gear. They assist one or several purse seiners in the detection of tuna schools and the management fish aggregating devices (FADs) as well as buoys used to locate natural floating objects (LOGs) and FADs.	C 1,5,7,17,22	For collection of FADs only.
	Recreational Fishing	Any fishery undertaken by a vessel or person for recreational purposes which does not involve any commercial activity and result in the trading, offering for sale or selling of fish (	C 1,4,5,7,11	Release of Sharks and Rays is recommended
	Semi-industrial, hand gathering (Small-scale Fisheries)	A fishing vessel measuring between 12- and 24-meters length overall (draft Fisheries Act, Nov 2022) engaged in a fishing using hand gathering techniques. Includes sea-cucumber	C 1,4,5,7,17	Catch and release of Sharks and Rays is recommended.
	Semi-industrial, hook & line (Small-scale Fisheries)	A fishing vessel measuring between 12- and 24-meters length overall (draft Fisheries Act, Nov 2022) engaged in a fishing using hook & line gear.	C 1,4,5,7,17	Catch and release of Sharks and Rays is recommended.

Sectors	Marine Activity	Definition	Zone 2	Area based management Considerations
	Semi-industrial, longline (Small-scale Fisheries)	A fishing vessel measuring between 12- and 24-meters length overall (draft Fisheries Act, Nov 2022). The semi-industrial longline is a local fishery targeting tunas, swordfish and other pelagic species using monofilament longline (SFA). Semi-industrial longline vessels in Seychelles voluntarily fish off the Mahé Plateau.	C 1,4,5,7,17	Catch and release of Sharks and Rays is recommended.
	Sport Fishing (multiple activities)	Sport fishing means a fishing activity undertaken for sports or recreation which involves the hiring, chartering, or leasing of a vessel, but which does not result in the trading, offering for sale or selling of fish taken during the fishing activity. (Fisheries and Aquaculture Bill 2023). Sport fishing includes sport fishing tournaments, with may or may not involve the hiring, chartering, or leasing of a vessel not exceeding 40 m in length overall. The Seychelles Sport Fishing Club (SSFC), founded in 2009, is a member of the International Game Fishing Association (IGFA). Sport fishing tournaments may engage in tagging programs to support conservation and education activities. Sport fishing is 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 (source: M. Cosson).	C 1,4,5,7,11,16	Catch and release of Sharks and Rays is recommended.
	Subsistence Fishing	Subsistence fishing means a fishing activity other than recreational or sports fishing, conducted exclusively for personal or family consumption. Fisheries and Aquaculture Bill (2023).	C 1,5,7,11	Authorised in line with national fisheries plans. Catch and release of Sharks and Rays is recommended
Maritime Infrastructure	Ballast Water and Bilge Dumping	In Seychelles, ballast water exchange areas have been demarcated for both the northern and southern approaches to the Port. The distance is 80 miles from port. To the north, this is NE of Bird Island. These are administrative directions from the Port of Victoria	C 1,5	
	Beach Replenishment	Beach replenishment is a type of dumping with the artificial placement of sand on an eroded shore to maintain the amount of sand present in the foundation of the coast, and this way to compensate for natural erosion and to a greater or lesser extent protect the area against storm surge. Nourishment may also use gravel and small pebbles, in particular for the shoreface (the nearshore area within the low water mark and the limit where fair weather waves interact with the seabed). Beach nourishment also often aims at maintaining beach width for tourism and recreational purposes. The process involves dredging material (sand, gravel, small pebbles) from a source area (offshore, near-land or inland) to feed the beach where erosion is occurring. Beach nourishment does not halt erosion, it addresses sediment deficit by providing additional sediment from external sources, often requiring repeated interventions (EU Climate Adapt). For creation of new islands or reclaiming land, see Reclamation	C 1,5	
	Bunkering at Sea	Supplying fuel to ships for their own use. Involves the transfer of fuel from one vessel to another. Bunkering may apply to fishing vessels, petroleum activities and Scientific Geophysical surveys. Bunkering at sea is allowable in Seychelles and would be done with local vessels and companies.	C 1,5	Unauthorised in DIMSUA as 2 Km away from an Island is too close and too shallow. the risk of oil spill to high
	Bunkering at Sea, fishing vessels	Supplying fuel to ships for their own use. Involves the transfer of fuel from one vessel to another. Bunkering may apply to fishing vessels, petroleum activities and Scientific Geophysical surveys. Bunkering at sea is allowable in Seychelles and would be done with local vessels and companies.	C 1,5	Unauthorised in DIMSUA as 2 Km away from an Island is too close and too shallow. the risk of oil spill to high

Sectors	Marine Activity	Definition	Zone 2	Area based management Considerations
	Coastal Dredging and Dredge Spoils	The removal of mud, sand, or other natural materials from the seabed, often to increase the depth of water or to restore to a previous depth such as near a wharf, jetty or beach landing site. Dredging is used in the Outer Islands near the coastline to improve access to atolls through lagoons and may be necessary for essential access to in marine protected areas for management, monitoring, research, and enforcement. Dredging may also be allowable to support an activity in consideration of when the impacts to the marine environment from that activity would be less than the impacts to the terrestrial environment from that same activity. The disposal of dredge spoils is not allowable in Zone 1 and Zone 2 areas so this will need to be included in the EIA and other environmental review process to address the location for dredge spoils during coastal dredging activity. Desilting is when waters become too shallow or polluted with mud, silt, and organic detritus (such as leaf litter), and mechanical silt removal may be required	C 1,5,19	Strick mitigation measures to be put in place
	Commercial Shipping	In the Seychelles, there are no traffic separation schemes for the Port of Victoria 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.	C 1,5	Not authorised as Denis is situated in area to be avoided on the British admiral chart
	Desalination, boat-based	Desalination systems for boats include portable and built in units.	C 1,5	
	Desalination, land-based	Desalination on land using a water purification process	C 1,5	
	Disposal, Dumping	The disposal or dumping of approved materials at designated sites or with an authorised permit or license. As per International Convention for the Prevention of Pollution from Ships (MARPOL), dumping of oil, hydrocarbons or noxious substances into the marine environment is not allowed. For dumping of dredge spoils from coastal dredging, see Coastal Dredging and Dredge Spoils. For dumping related to beach replenishment, see Beach Replenishment.	X	
	Ferries and Transportation	Passenger carrying vessels that operate between two points of land. In the Seychelles, there are ferries between Mahe, Praslin and La Digue islands. Private ferries also operate within the Inner Islands.	C 1,5,19	Visitors is required to contact DPI head Office two weeks in advance as Prior Informed Consent is required to access the Island. Vessel required to contact the Island via open channel when entering the DIMSUA
	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.	C 1,5,19	
	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 Mahe 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).	X	

Sectors	Marine Activity	Definition	Zone 2	Area based management Considerations
	Renewable 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 drop-offs. 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.	C 1,5,19	
	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.	C 1,5,19	
	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.	C 1,5,19	
	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 Mahe, installed in [DATE]. The marine context includes anchored offshore wind and projects involving reclamation of land or development of artificial islands.	C 1,5,19	In view that this activity requires reclamation or development of artificial island; it is considered not compatible in DIMSUA as reclamation is unauthorised
	Renewable Energy, wave	Wave energy converters capture the energy contained in ocean waves and use it to generate electricity	C 1,5,19	
	Structures, marine other	Means any structure or infrastructure that is floating on the surface of the water or fully or partially submerged. Could include, but is not limited to, accommodation, restaurants, visitor centres, decommissioned vessels, structures with pontoons, facilities for research, aquaculture, renewable energy, or other uses. Structures do not have a working engine or any propulsion mechanism, system, or device, and does not include active vessels of any kind, FADs (anchored or floating), or natural floating objects.	C 1,4,5,19	With prior approval from DPI and GIF
	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	C 1,5,19	
Non-Renewable & prospecting	Bioprospecting Development	Generally, 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	C 1,5,6,10	
	Mining, deep-sea	Deep-sea mining is the process of retrieving mineral deposits from the deep seabed – the ocean below 200m. (IUCN). 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) and rock concretions that lie on the seabed sediment (ISA).	X	

Sectors	Marine Activity	Definition	Zone 2	Area based management Considerations
	Mining, sand	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 Mahe.	X	
	Mining, shallow	Marine operations associated with extracting minerals and aggregates in depths less than 200 meters.	X	
	Petroleum Exploration, Drilling	This activity includes the search for oil and gas resources using seismic, electrical, gravity, or magnetic data to evaluate the Earth's subsurface. Drilling is the creation of wells in the ocean floor to locate subsurface oil and gas deposits (Schlumberger). In Seychelles, licensed concessions are located on and off the Mahé Plateau and Areas of Interest are identified by PetroSeychelles in the Petroleum Atlas. Includes exploration for methane gas.	C 1,5,6,10	PetroSeychelles statutory mechanism to reduce impact include including vessels not operating within 5 km of the coast.
	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 exploit it fully and efficiently 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. Includes Methane.	C 1,5,6,10	PetroSeychelles statutory mechanism to reduce impact include including vessels not operating within 5 km of the coast.
Tourism & Recreation	Anchorage and Mooring Buoys	Anchoring sites and mooring buoys for all vessels including recreational, sport fishing, private, fishing vessels and commercial vessels. Includes temporary vessel anchorages at designated sites and permanent mooring buoys. Does not include docks, wharves, piers, or related facilities in marinas and harbours that are attached to the shore or the seabed. Commercial moorings are large, permanent moorings for large commercial vessels, typically associated with a commercial port. Commercial moorings and anchorages are used by commercial vessels or ships entering or leaving a port's shoreside facility. In Seychelles, commercial moorings and anchorages are used all year round and designated within the Port of Victoria boundary by the Port Authority.	C 1,4,5	Authorised in designated mooring area. Authorised in DIMSUA exclusively on sandy bottom free of coral and seagrass. Vessels are to keep away from flight path
	Cruise ships	A passenger ship that is carrying or capable of carrying more than twelve passengers (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). In Seychelles, a cruise ship is defined by a vessel with 12 or more paying guests. A private yacht with 12 or more private guests is not a cruise ship. For activities involving fishing see Fishing activities.	C 1,4,5,11	Prior to visiting the Island, please contact DPI head Office two weeks in advance as Prior Informed Consent is required. Vessel required to contact the Island via open channel when entering the DIMSUA
	Motorised Activities, commercial	Commercial activities using watercraft, small vessel, or other definitions of 'boat' for commercial tourism. Includes marine charters and licensed hire craft. Hire Craft license means 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 Hire craft Act). Includes renting or chartering a sailing vessel or motor yacht and travelling to island destinations. For activities involving fishing see the Fishing activities.	C 1,4,5,11,16	Prior to visiting the Island, contact DPI head Office two weeks in advance as Prior Informed Consent is required. Vessel required to contact the Island via open channel when entering the DIMSUA. Maximum vessel length 6m and Speed limit < 5 knots in 0- 5 m depth area.

Sectors	Marine Activity	Definition	Zone 2	Area based management Considerations
	Motorised Activities, non-commercial	Recreational, non-paying, activities aboard any vessel equipped with an engine. Includes small vessels, watercraft, sailing vessels with an auxiliary engine, jet engines, hovercraft, and submersibles. Includes Watercraft, Hire craft licenses. For activities involving fishing see Fishing activities.	C 1,4,5,11	Prior to visiting the Island, contact DPI head Office two weeks in advance as Prior Informed Consent is required. Vessel required to contact the Island via open channel when entering the DIMSUA. Maximum vessel length 6m and Speed limit < 5 knots in 0- 5 m depth area.
	Non-Motorised Activities, commercial	Commercial activities aboard any vessel without an auxiliary engine. If the commercial activity needs support from a motorised vessel for it to take place, example boat-based SCUBA diving at an offshore reef, it is a motorised activity. For activities involving fishing see Fishing activities.	C 1,4,5,16	Prior to visiting the Island, contact DPI head Office a two weeks in advance s Prior Informed Consent is required. Vessel required to contact the Island via open channel when entering the DIMSUA. Maximum vessel length 6m and Speed limit < 5 knots in 0- 5 m depth area.
	Non-Motorised Activities, non-commercial	Recreational, non-paying, activities that don't use an engine or motor of any kind. Includes sailing vessels without an auxiliary motor (electric or fuel), standup paddle boards, kayaks, snorkeling.	C 1,4,5	Prior to visiting the Island, contact DPI head Office two weeks in advance as Prior Informed Consent is required. Vessel required to contact the Island via open channel when entering the DIMSUA. Maximum vessel length 6m and Speed limit < 5 knots in 0- 5 m depth area.
	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. For activities involving fishing see Fishing activities	C 1,5	
Research	Aquaculture Research	A licence for the purposes of carrying out studies, assessments or other research or development activities related to aquaculture or the aquaculture sector	C 1,4,5,6,11,23	Upon receiving endorsement by DPI and signing of research agreement with GIF
	Bioprospecting Research	Bioprospecting for research and non-commercial purposes. Is the search for products/compounds derived from plants, animals, and microorganisms that exhibit useful properties	C 1,5,6,11	Upon receiving endorsement by DPI and signing of research agreement with GIF
	Hydrographic Surveys	A scientific research technique used to measure the depth and bottom configuration of the ocean	C 1,5,6,11	Upon receiving endorsement by DPI and signing of research agreement with GIF
	Scientific Geophysical Surveys and Research	Activities to evaluate the Earth's subsurface and in support of determining the extent of Seychelles continental shelf. Scientific geophysical surveys use seismic, electrical, gravity, or magnetic techniques. Interest to conduct scientific geophysical surveys and research may include areas where petroleum exploration and development are not allowable to evaluate the spatial extent of geologic features in the Earth's subsurface beyond the exploration site(s).	C 1,5,6,8,11	Upon receiving endorsement by DPI and signing of research agreement with GIF; Marine Mammal Observer and Passive Acoustic Monitoring equipment required on the vessel. Vessel entering 0-5 m depth area must be less than 6 m and travelling at < 5 knots
	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.	C 1,5,6,11	Upon receiving endorsement by DPI and signing of research agreement with GIF; Vessel entering 0-5 m depth area must be less than 6 m and travelling at < 5 knots



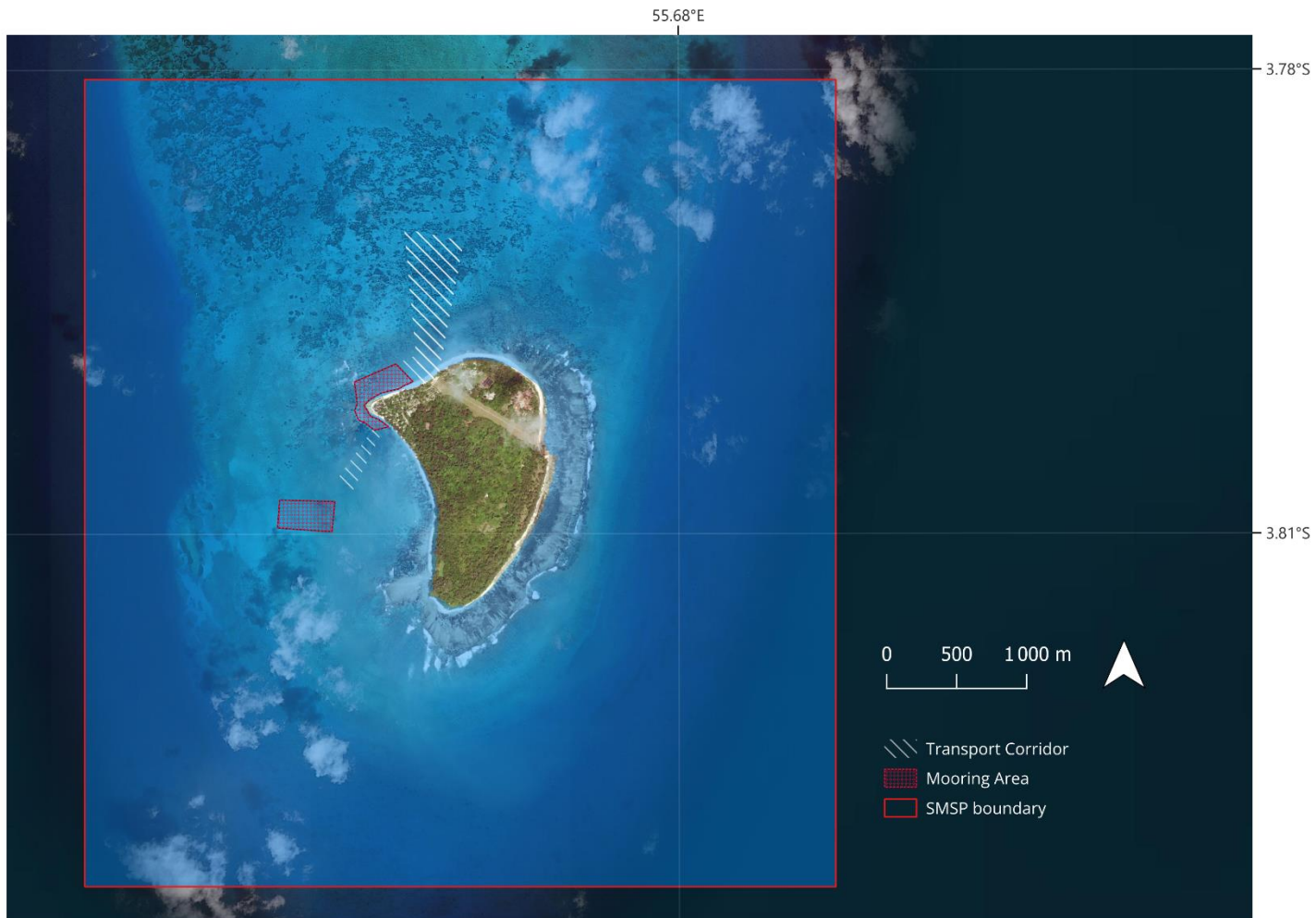


Figure 10. Proposed zonation for the Denis Island Marine Sustainable Use Area (April 12<sup>th</sup> 2024)

## 9.4. Management strategies and actions

Each thematic scope includes a list of management strategies and activities. The extensive details of each management strategies, description of the activities and responsible for implementation is available in Table 6, 7, 8, 9 & 10.

### 1. Finance: Innovative financing strategies are implemented to ensure sustainability of actions

The section finance includes 1 management strategy: Development of innovative financial strategy and revenue stream to support Denis Island Marine Sustainable Area Mission and activities.

Table 6. Overview of Activities for Implementing Innovative Financing Strategies to Ensure Sustainability of Denis Island Marine Sustainable Area Mission, Including Description, Relevant Legal Framework, and Responsible Entities

Activities	Description of the activities	Responsible
<b>1</b>	<b>Innovative financing strategies are implemented to ensure sustainability of actions</b>	
1.1	Development of innovative financial strategy and revenue stream to support Denis Island Marine Sustainable Area Mission	
1.1.1	Trial implementation of Denis Island MPA User fees Nature Reserves and Conservancy Act (2022) allows for the following: The person managing a protected area may charge a person such fee for entering or for being or remaining in a protected area or a part thereof as may be determined in consultation with the Minister. A fee under subsection (1) pertaining to each protected area shall be conspicuously displayed in a public notice at the entrance of a protected area.	DPI
1.1.2	Access to Tourism Environmental levy fees 100 SCR per night per adult guest Tourism Environmental levy fees implemented in 2023	GoS
1.1.3	Company Donations <i>Denis Island MSUA Financial plan, 2019:</i> Considering changes to the previous CSR requirement, the parent company to DPI are committed to continuing financial support to Denis Island MPA and GIF; the rate at which will depend on annual revenues and MPA needs and is likely to fluctuate annually.	DPI
1.1.4	Philanthropic Donations <i>Development of a business plan of Denis MSUA, 2019:</i> The philanthropic contribution is considered a better option than the application of mandatory environment fee.	GIF
1.1.5	Grant Funding Grant funding will remain an important component of the financing strategy, particularly for shorter-term or one-off project-based activities. GIF should continue to seek out and secure philanthropic grants for its conservation work.	GIF
1.1.6	Sale of local artwork specially crafted and branded The sale of appropriate Denis Island branded souvenir artworks and merchandise that complement the overall holiday experiential is another potential revenue source.	DPI

## 2. Protect: Critical habitat and associated Threatened species are protected

The section protect includes 3 management strategies: 1) Establish zonation of the area with designated zone for sustainable use, transport, and mooring; 2) Promote Ecotourism activities minimizing environmental impact and contribute to the conservation of marine and coastal ecosystems and 3) Retrieve and remove drifting FADs of high risk to habitats and species.

Table 7. Overview of Activities Aimed at Protecting Critical Habitat and Threatened Species, Including Description, Objectives, and Responsible Entities

Activities	Description of the activities	Responsible	
<b>2</b>	<b>Critical habitat and associated Threatened species are protected</b>		
2.1	Establish zonation of the area with designated zone for sustainable use, transport, and mooring		
2.1.1	Implement area-based management and allowable activities metrics	It encompasses defining permissible activities within the designated sustainable use area mooring areas and transportation corridors.	DPI
2.1.2	Register the zonation on the official navigation chart	Collaborating with maritime authorities, documenting regulations, and integrating transportation corridor and mooring area into navigational maps. This process ensures mariners have access to accurate information, promoting safe and compliant navigation and mooring within the DIMSUA.	GIF
2.1.3	Communicate Zonation Map through National and International media channel	Disseminate the Zonation Map through national and international media channels, employing various communication to reach diverse audiences and promote awareness of the map's significance for conservation and planning efforts.	GIF
2.2	Promote Ecotourism activities minimizing environmental impact and contribute to the conservation of marine and coastal ecosystems		
2.2.1	Update of best practices board for turtle watching snorkelling & scuba diving for guest user	Incorporating new information, safety measures, and conservation practices to educate and inform guests on how to interact sustainably with marine life and ecosystems while enjoying these recreational activities.	GIF
2.2.2	Installation of Snorkelling trail on House Reef with resting buoys	Resting buoys placed strategically along the reef allow snorkelers to take breaks, observe marine life, and enjoy the underwater environment without having to swim continuously. This initiative enhances the snorkelling experience, promotes safety, and encourages sustainable interaction with the reef ecosystem.	GIF
2.2.3	Implement best practices guidelines for catch and release of fish, recreational, sportfishing and fly fishing	Includes educating fishers on proper handling techniques, using barbless hooks to reduce injury and ensuring proper revival before release. Additionally, promoting awareness of regulations, selecting appropriate gear, and prioritizing the welfare of fish are essential components of implementing these guidelines to sustainably enjoy fishing activities.	GIF
2.3	Retrieve and remove drifting FADs of high risk to habitats and species		
	Develop a Standard Operating Procedure (SOP) for the retrieval and removal of Fish Aggregating Devices (FADs)	The SOP outlines step-by-step guidelines for dismantling, retrieving, and transporting FADs from the deployment site, as well as proper disposal or storage procedures.	GoS

### 3. Restore: Sustaining the function of threatened species and critical habitats over time and space through monitoring and restoration efforts

The section Restore include 2 management strategies: 1) Monitor Threatened species populations and critical habitat indicators through regular surveys to track conservation effectiveness and adapt management strategies as needed; 2) Implement habitat restoration projects to rehabilitate degraded habitats and enhance their resilience to climate change and other threats.

Table 8. Overview of Activities Aimed at Sustaining Threatened Species and Critical Habitats, Including Description, Objectives, and Responsible Entities

Activities	Description of the activities	Responsible	
<b>3</b>	<b>Sustaining the function of Threatened species and critical habitats over time and space through monitoring and restoration efforts</b>		
3.1	Monitor Threatened species populations and critical habitat indicators through regular surveys to track conservation effectiveness and adapt management strategies as needed		
3.1.1	Develop a comprehensive 2025-2030 research plan for coral reef, seagrass bed, and beach ecosystems, integrating indicators for populations of turtles, sharks, rays, and marine mammals	Key components of the research plan may include designing sampling methodologies, conducting surveys and assessments, analysing data on species abundance and distribution, identifying habitat preferences, investigating threats and stressors, and developing management strategies for conservation and sustainability.	GIF
3.1.2	Develop Research Agreement template	Creating a standardized document that outlines the terms, conditions, and expectations for research collaborations between different parties, such as academic institutions, research organizations, and funding agencies.	GIF
3.1.3	Conduct data collection activities to provide scientific evidence supporting the nomination of DIMSUA as an Important Shark and Rays Area (ISRA)	Data collected through these activities are analysed to demonstrate the area's importance as critical habitat for these species, contributing to the scientific basis for its designation as an ISRA.	GIF
3.1.4	Design and implement a coastal erosion monitoring system to track and analyse changes in shoreline dynamics over time	Includes selecting monitoring parameters, deploying appropriate technologies, which may include satellite imagery, aerial surveys, GPS tracking, LiDAR scanning, drone-based surveys, and on-ground instrumentation like tide gauges and beach profiling equipment. and analysing data to inform coastal management strategies and mitigate erosion impacts.	GIF
3.1.5	Design and implement a marine database management scheme to efficiently organize, store, and manipulate data	Aimed at efficiently organizing and storing data related to marine environments.	GIF
3.1.6	Conduct Marine monitoring fieldwork and data collection	This collected data forms the basis for understanding ecosystem trends, identifying threats, and informing conservation and management strategies aimed at preserving marine biodiversity and ecosystem integrity.	GIF
3.1.7	Marine Monitoring -Data Analysis and Reporting	This includes processing and interpreting diverse datasets such as water quality measurements, biodiversity surveys, and habitat assessments. The results are then compiled into comprehensive reports to communicate findings, trends, and recommendations to stakeholders, policymakers, and the scientific community, facilitating informed decision-making and guiding conservation and management efforts aimed at protecting marine environments.	GIF

3.1.8	Evaluate effectiveness	DIMSUA	Management	The evaluation will be conducted using the Management Effectiveness Tracking Tool (METT), specifically version 4.0 (METT 4.0). METT is a standardized tool designed to assess the effectiveness of management practices within protected areas. It covers a range of aspects including ecological monitoring, stakeholder engagement, enforcement, and financial management. By applying METT 4.0 to DIMSUA, the goal is to comprehensively evaluate the management practices and their effectiveness in achieving the conservation objectives of the marine sustainable use area. This evaluation can provide valuable insights into areas of strength and weakness within the management regime, guiding future decision-making and conservation efforts to ensure the long-term sustainability of Denis Island's marine resources.	
3.2	Implement habitat restoration projects to rehabilitate degraded habitats and enhance their resilience to climate change and other threats				
3.2.1	Coastal rehabilitation program			Designing and implementing initiatives such as beach nourishment, dune restoration, and vegetation planting to restore and enhance coastal ecosystems, aiming to mitigate erosion, enhance biodiversity, and improve habitat quality.	GIF
3.2.2	House Reef Coral Restoration project			Actively restoring degraded coral reefs within the House Reef area through techniques such as coral transplantation, coral fragment attachment, and coral reef gardening, with the goal of increasing coral cover and biodiversity.	GIF
3.3	Development and Implementation of specific fisheries measures, including a ban on targeted shark and ray fishing, the release of sharks and rays, and the release of all billfish.				
3.3.1	Stakeholder consultation on proposed fisheries measures in collaboration with SFA			Conduct public consultations with relevant stakeholders, including fishermen, regarding the implementation of specific fisheries measures within the DIMSUA. These proposed measures include prohibiting targeted shark and ray fishing, mandating the release of sharks and rays, releasing all billfish, and restricting all fishing methods in depths less than 5 meters, except for fly fishing with mandatory catch and release using barbless hooks.	GIF/SFA
3.3.2	Submission, through SFA, of a request to the Implementation Committee of the Co-management Plan (ICCP) for the Mahé Plateau Trap and Line Fishery for the implementation of the proposed specific fisheries measures in the DIMSUA.			Submit an official written request to the Implementation Committee of the Co-management Plan (ICCP), providing detailed information on the science-based proposed fisheries measures for their consideration. The ICCP will then deliberate on the proposals and submit them for approval to the Ministry of Fisheries (MoF).	DIP/GIF/SFA
3.3.3	Implementation of the proposed fisheries measures			Review the specific sections of the DIMSUA management plan to incorporate the fisheries measures endorsed by the Ministry of Fisheries (MoF). Once integrated, communicate the updated plan to stakeholders, ensuring they are informed of the changes and understand their implications.	DIP/GIF/SFA

#### 4. Sustainable Use: Ensure sustainable use of marine resources for all stakeholders, including local communities, fishers, and tourists

The section Sustainable Use include 3 management strategies: 1) Implement strict biosecurity measures; 2) Engage with all relevant stakeholders and maintain transparent communication and decision-making processes. and 3) Conduct Education, Outreach and Awareness campaign.

Table 9. Overview of Activities Aimed at Ensuring Sustainable Use of Marine Resources for Stakeholders, Including Description, Objectives, and Responsible Entities

Activities	Description of the activities	Responsible	
<b>4</b>	<b>Ensure sustainable use of marine resources for all stakeholders, including local communities, fishers, and tourists</b>		
4.1	Implement strict biosecurity measures		
4.1.1	Surveillance and eradication of pests	Conducting regular surveys and removal efforts to control invasive species.	DPI
4.1.2	Develop pest management strategies including quarantine area	Formulating comprehensive strategies to manage invasive species, including establishing quarantine zones to prevent their spread, and implementing control measures.	DPI
4.2	Engage with all relevant stakeholders and maintain transparent communication and decision-making processes.		
4.2.1	Conduct community meetings, workshops, and consultations to engage stakeholders in decision-making processes and share information about marine conservation efforts	During implementation process and review engage stakeholders through a series of community meetings, workshops, and consultations to foster participation, gather feedback, and share information about marine conservation efforts.	GIF
4.2.2	Establish a complaints and resolution framework that involves an independent body	Creating a structured framework to receive, address, and resolve complaints related to Denis Island MSUA with an independent body overseeing the process to ensure transparency and fairness.	SMSP Unit
4.3	Conduct Education, Outreach and Awareness campaign		
4.3.1	Prepare an Education and Awareness plan	Developing a comprehensive plan to educate and raise awareness among local communities, schools, and businesses about the importance of marine conservation, sustainable practices, and the role individuals can play in protecting marine ecosystems around Denis Island.	GIF
4.3.2	Implement an Education and Awareness plan	Executing the education and awareness plan through various outreach activities such as school visits, community events, signage, and media campaigns to promote behaviour change and foster a culture of marine sustainability.	GIF
4.3.3	Educational activities with staff on Denis	Delivering training sessions and workshops for staff members on Denis Island to enhance their understanding of marine conservation principles, species identification, and sustainable practices, empowering them to act as ambassadors for conservation efforts with guests.	GIF

## 9.5.Operational Strategies

The Operational Strategies outlined in the table encompass administrative, financial, conservation, and enforcement aspects for the effective management of DIMSUA.

Table 10. Operational Strategies for Management of DIMSUA, Including Administration, Finance, Conservation, Research, Enforcement, and Risk Management, with Responsible Entities and Reporting Requirements

Operational Strategies		
<b>Administration &amp; Finance</b>		
Human resources	Hiring and training personnel specifically dedicated for admin, surveillance, patrol, and marine conservation efforts on Denis Island.	DPI
Financial Management	Maintain accurate financial record & monitoring expenditures	DPI
Contracting and Procurement	Contract with vendors, consultants, or service providers for goods and services related to implementation of management activities.	DPI
Yearly reporting on activities implementation	Compiling and disseminating annual reports detailing the progress, achievements, challenges, and outcomes of management plan activities undertaken throughout the year in compliance with Nature Reserves and Conservancy Act (2022) requirements.	DPI
Yearly financial report and audit	Providing annual financial reports and undergoing audits to ensure accurate accounting in compliance with Nature Reserves and Conservancy Act (2022) requirements.	DPI
<b>Conservation &amp; Research</b>		
Contracting and Procurement	Administrators may need to contract with researcher, consultants, or service providers for goods and services related to scientific research, or environmental monitoring.	GIF
Grant & Project based Management	Write and manage grant proposals to secure funding for research and conservation.	GIF
<b>Enforcement</b>		
Surveillance and Enforcement plan implementation	Rolling out a comprehensive plan to monitor marine protected areas, enforce regulations, and deter illegal activities such as poaching, fishing violations, and habitat destruction, utilizing patrols, surveillance technology, and collaboration with Seychelles Coast Guard and NISCC.	DPI/SGC/ NISCC/SFA
<b>Risk and Disaster Management</b>		
Risk and disaster management plan (e.g. oil spill) implementation and capacity building	Developing robust strategies and building capacity to effectively manage and respond to potential risks and disasters threatening marine ecosystems, such as oil spills, natural disasters, and pollution incidents, through training, simulation exercises, and collaboration with emergency responders.	MACCE
Yearly reporting on activities implementation	Compiling and disseminating annual reports detailing the progress, achievements, challenges, and outcomes of management plan activities undertaken throughout the year.	DPI/GIF
Yearly financial report and audit	Providing annual financial reports and undergoing audits to ensure accurate accounting and compliance with Nature Reserves and Conservancy Act (2022) requirements.	DPI/GIF

## 10. Performance Measuring Framework

### 10.1. Developing the PMF

The development of the Performance Measuring Framework (PMF) involved a systematic approach to defining indicators and targets across activities. Each activity within the PMF was analyzed to identify key metrics for measuring progress towards conservation goals. For instance, for activities focused on protecting critical habitats and Threatened species. Additionally, efforts were made to ensure alignment with regulatory standards, such as the Nature Reserves and Conservancy Act (2022), ensuring transparency and accountability in reporting and financial practices. Annual reporting on activities implementation will involve compiling and disseminating comprehensive reports detailing progress, achievements, challenges, and outcomes of management plan activities conducted throughout the year, in accordance with regulatory requirements. Additionally, the implementation will include the provision of yearly financial reports and undergoing audits to ensure accurate accounting practices, in alignment with the mandates of the Nature Reserves and Conservancy Act (2022). These steps are crucial for maintaining transparency, accountability, and effective resource utilization within the management plan, thereby facilitating the achievement of conservation goals. Finally, the PMF proposes to reflect the IUCN WCPA Framework for protected area management effectiveness (or PAME) by conducting a baseline evaluation of management effectiveness using standard tools and methods (METT 4.0) by 2027<sup>37</sup> and conduct a review of the effectiveness by 2030.

The Performance Measure Framework provides clear indicators, baselines, and targets for each activity, facilitating effective monitoring and evaluation of progress towards conservation goals.

Table 11. Implementation Timeline and Progress Tracking for Activities Aimed at Sustainable Management of Denis Island Marine Sustainable Use Area, Including Key Indicators, Baseline Data, and Targets for 2027 and 2030.

	Activities	Indicators	Baseline	2027	2030
<b>1</b>	<b>Innovative financing strategies are implemented to ensure sustainability of actions</b>				
1.1	Development of innovative financial strategy and revenue stream to support GIF and Denis Island sustainable area mission				
1.1.1	Trial implementation of Denis Island MPA User fees	\$ revenue generation	0	TBD	TBD
1.1.2	Access to Tourism Environmental levy fees	\$ revenue generation	0	TBD	TBD
1.1.3	Company Donations	\$ revenue generation	0	TBD	TBD
1.1.4	Philanthropic Donations	\$ revenue generation	0	TBD	TBD
1.1.5	Grant Funding	\$ revenue generation	0	TBD	TBD
1.1.6	Sale of local artwork specially crafted and branded	\$ revenue generation	0	TBD	TBD

<sup>37</sup> Stolton, S., Dudley, N., Belokurov, A., Deguignet, M., Burgess, N. D., Hockings, M., ... & Young, L. (2019). Lessons learned from 18 years of implementing the management effectiveness tracking tool (METT): A perspective from the METT developers and implementers. *Parks*, 25(2), 79-92.



Activities	Indicators	Baseline	2027	2030	
<b>2</b>	<b>Critical habitat and associated Threatened species are protected</b>				
2.1	Establish zonation of the area with designated zone for sustainable use, transport corridors and mooring area				
2.1.1	Implement area-based management and allowable activities metrics	% of DIMSUA area	0	100%	100%
2.1.2	Register the zonation on the official navigation chart	Map availability	0	0	1
2.1.3	Communicate Zonation Map through National and International media channel	Press release	0	5	10
2.2	Promote Ecotourism activities minimizing environmental impact and contribute to the conservation of marine and coastal ecosystems				
2.2.1	Update of best practices board for turtle watching, snorkelling & scuba diving for guest user	Board	TBD	1	1
2.2.2	Installation of Snorkelling trail on House Reef with resting buoys	Resting Buoys	0	2	2
2.2.3	Implement best practices guidelines for catch and release of fish, recreational, sportfishing and fly fishing	Guidelines document	0	1	1
2.3	Retrieve and remove drifting FADs of high risk to habitats and species				
	Develop a Standard Operating Procedure (SOP) for the retrieval and removal of Fish Aggregating Devices (FADs)	Report on FAD retrieval and removal	0	2	6

Activities	Indicators	Baseline	2027	2030	
<b>3</b>	<b>Sustaining the function of Threatened species and critical habitats over time and space through monitoring and restoration efforts</b>				
3.1	Monitor Threatened species populations and critical habitat indicators through regular surveys to track conservation effectiveness and adapt management strategies as needed				
3.1.1	Develop a comprehensive 2025-2030 research plan for coral reef, seagrass bed, and beach ecosystems, integrating indicators for populations of turtles, sharks, rays, and marine mammals	Research plan available	0	1	1
3.1.2	Develop Research Agreement template	Research agreement available	0	1	1
3.1.3	Conduct data collection activities to provide scientific evidence supporting the nomination of Denis Island MSUA as an Important Shark and Rays Area (ISRA)	Nomination of Denis Island MSUA as an Important Shark and Rays Area (ISRA)	0	0	1
3.1.4	Design and implement a coastal erosion monitoring system to track and analyse changes in shoreline dynamics over time	Coastal Erosion Data available	0	1	1
3.1.5	Design and implement a marine database management scheme to efficiently organize, store, and manipulate data	Database available	0	1	1
3.1.6	Conduct Marine monitoring fieldwork and data collection	# of fieldwork conducted	1	3	6
3.1.7	Marine Monitoring -Data Analysis and Reporting	# Marine monitoring report available	1	3	6
3.2	Implement habitat restoration projects to rehabilitate degraded habitats and enhance their resilience to climate change and other threats				
3.2.1	Coastal rehabilitation program	Area of rehabilitated coast	0	TBD	TBD
3.2.2	House Reef Coral Restoration project	Area (Ha) of restored reefs using resilient coral species	0	0.1	0.2
3.3	Development and Implementation of specific DIMSUA fisheries measures, including a ban on targeted shark and ray fishing, the release of sharks and rays, and the release of all billfish.				
3.3.1	Stakeholder consultation on proposed fisheries measures in collaboration with SFA	# of stakeholders consultation report	0	1	1
3.3.2	Submission, through SFA, of a request to the Implementation Committee of the Co-management Plan (ICCP) for the Mahé Plateau Trap and Line Fishery for the implementation of the proposed specific fisheries measures in the DIMSUA.	# of technical report	0	1	1
3.3.3	Implementation of the proposed fisheries measure	# of technical report	0	3	6

Activities	Indicators	Baseline	2027	2030	
<b>4</b>	<b>Ensure equitable access and sustainable use of marine resources for all stakeholders, including local communities, fishers, and tourists</b>				
4.1	Implement strict biosecurity measures				
4.1.1	Surveillance and eradication of pest	Yearly monitoring report	0	3	6
4.1.2	Develop pest management strategies including quarantine area	Strategy proposed and quarantine area designated	0	1	1
4.2	Engage with all relevant stakeholders and maintain transparent communication and decision-making processes.				
4.2.1	Conduct community meetings, workshops, and consultations to engage stakeholders in decision-making processes and share information about marine conservation efforts	Report on consultative process	1	2	3
4.2.2	Establish a complaints and resolution framework that involves an independent body (SMSP Unit)	Framework available	0	1	1
4.3	Conduct Education, Outreach and Awareness campaign				
4.3.1	Prepare an Education and Awareness plan	Education and Awareness plan available	0	1	1
4.3.2	Implement an Education and Awareness plan	Report on activities implementation	0	1	2
4.3.3	Educational activities with staff on Denis	# of activities conducted	0	TBD	TBD
<b>Evaluate DIMSUA Management Effectiveness</b>		<b># of METT evaluation</b>	<b>0</b>	<b>1</b>	<b>2</b>

## 11. Management Plan Review Process

The plan is designed to span a duration of five years (2025–2030), with a mid-term review and assessment scheduled for 2027. This review process is crucial for facilitating adaptive management, ensuring the optimal achievement of the Mission Statement and Strategic Objectives, and preparing the subsequent plan in a timely manner.

By conducting a mid-term review in 2027, the co-managers will have the opportunity to evaluate all activities and assess priority needs. Monitoring efforts will focus on assessing the attainment of targets and objectively verifiable indicators, as outlined in the PMF. Additionally, a mid-term review should be conducted to evaluate progress, identify any emerging challenges that need to be addressed, and reassess prioritization for the remaining three years. This approach ensures the optimization of the thematic objectives.

Finally, the next iteration of the plan should be developed in the final year of the current plan, following an independent review of implementation and an assessment of changing circumstances and priorities. This process should involve consultation with pertinent stakeholders to ensure the continued relevance and effectiveness of the plan.

## ANNEXES

Annex 1. Implementation and finance plan

## Annex 2. Additional laws and regulations

The following act and relevant regulation were also considered during the development of this plan:

- Environment Protection (Restriction on the manufacturing, importation, distribution, and sale of Plastic Straws) Regulation, 2019
- Environment Protection (Restriction on importation, distribution and sale of plastic utensils and polystyrene boxes) regulations (2017)
- Environment Protection (Restriction on manufacturing, importation, distribution, and sale of plastic bags) Regulations (2017)
- Ports Authority Act (2004)
- Wild Animals (Whales Shark) Protection Regulation (2003)
- Maritime Zones Act (2000)
- Wild Animals (Turtles) Protection Regulations (1994)
- Fisheries Regulations (1987)
- Control Regulations (1978)
- Petroleum Mining Act (pollution control) (1976)
- Petroleum Mining Act (1976)
- Beach Control Act (1971)
- Wild Birds Protection Regulations (1966)
- Mineral Act 1962
- Harbour Regulations (1933)
- Harbour Act 1932

For more additional details and relevance of these laws and regulation please refer to the Summary of legislative and regulatory mechanisms for the protection of coral reefs and associated ecosystems Seychelles by P. Richard (2019).

### Annex 3. Surveillance, Patrol, and enforcement Strategy

Ensuring the effective management of a sustainable area involves vigilant surveillance, regular patrols, and strict enforcement of boundaries and permitted activities outlined in the proposed area-based management plan.

To address these concerns, the following strategy is proposed:

#### **Coastal and On-water Surveillance and Patrolling by Denis Island Pty Limited (DPI):**

- Trained DPI rangers will conduct daily coastal patrols and weekly on-water patrols.
- Monitoring of spatial and temporal traffic, detection of potential threats such as Fish Aggregating Devices (FADs), and identification of violations or non-compliance with area-based management regulations.
- Emphasis on daily patrols on foot around the Island and weekly patrols within the Sustainable Use management area (*See Figure 1*).
- Implementation of a communication strategy with non-compliant users, with extreme cases requiring assistance from the coast guard for law enforcement.

#### **Remote Surveillance by the National Information Sharing and Coordination Centre (NISCC):**

- NISCC, tasked with coordinating maritime activities and ensuring maritime security for sustainable development of the blue economy sector in Seychelles, will provide remote support.
- Serving as the central point of contact and coordination for maritime security operations among national stakeholders.
- Provision of Monitoring, Control, and Surveillance (MCS) support for the Denis Island Marine Sustainable Use Area.

#### **On-water Enforcement by the Seychelles Coast Guard (SCG):**

- Formal enforcement agreements between area managers and the SCG will ensure effective cooperation.
- The SCG, a maritime branch of the Seychelles Defence Forces, is responsible for search and rescue, environmental protection, and enforcement of maritime laws.
- Enforcement of laws and regulations within the Denis Island Sustainable Use Area to address any breaches.

#### **Fisheries Monitoring, Control and Surveillance (SFA):**

- Monitors fishing activities, enforces regulations, and collects data to inform decision-making.
- Fisheries Monitoring, Control, and Surveillance to ensure the sustainable management of marine resources.

Through the collaborative efforts of DPI, NISCC, SCG, and SFA the surveillance, patrol, and enforcement strategy aim to safeguard the integrity and sustainability of the marine environment around Denis Island.

This will be achieved and formalised through the co-management agreement (in prep.)





## Annex 4. MSP Zoning Design Codes for Allowable Activities

### FINAL FOR APPROVAL – version 2.0

Date: 12 April 2024

The Codes in this table apply to the superscript numbers in Allowable Activities Tables (AAT) for the MSP zoning design. Coding comes from legislation, regulations, scientific studies, government reports, unpublished studies, expert advice and/or best available information. Stakeholders have developed and refined the restrictions and codes, starting in 2015. See also General and Area-based Management Considerations and Master List of Definitions.

Code #	Codes for Allowable Activities Tables
1	See General and Area-based Management Considerations. Approved management plans needed for Zone 1 and Zone 2 areas including Environmental Impact Assessment (EIA) and/or Environmental and Social Impact Assessment (ESIA), where applicable or required. Development proposals require a transparent and participatory process with all stakeholders.
2	For subsistence fishing, the management plan for the area will provide direction on the meaning of, the conditions, and definition of the activities it would apply to, noting the intent of subsistence fishing for persons residing on the islands. Subsistence fishing would be allowable for residents of Outer Islands. The details of subsistence fishing can be done at the technical level alongside or after the MSP is approved. Quotas and monitoring of all species harvested is required. Sustainable yield would need to be determined in a Zone 1 (SFA). Definition and regulations of subsistence fishing are as per the Seychelles Fisheries Act [DATE] and regulation(s). See also notes in General Management Considerations.
4	Anchor in designated areas and/or use permanent mooring buoys as required by legislation, regulation, management plans or policy, and/or where practical.
5	Restrictions may apply to avoid or minimise disturbance on key species and ecological functions. For fisheries activities, see relevant legislation, regulations, and agreements for restrictions on target and non-target species.
6	Authorised approved permit and/or licenses are required for research and monitoring activities, where applicable.
7	Restrictions or prohibitions on fishing gear or technique may apply. Catch and release may be required, depending on species targeted. Some techniques may be prohibited, such as popping. Fishing in accordance with bag limits, catch limits, rod limits and other gear or catch or fishing effort restrictions found in laws, regulations, policies, management plans, or international conventions and agreements. Reporting requirements, catch & release requirements, bans on discards, bans on retention,

	handling of species, best practices such as catch & release National Oceanic and Atmospheric Administration (NOAA), Indian Ocean Tuna Commission (IOTC) Resolutions, and International Seafood Sustainability Foundation (ISSF) criteria.
8	All vessels conducting seismic surveys must have necessary functioning acoustic equipment and adequately trained operators to detect the presence of cetaceans to always avoid and minimise detrimental effects during operation in accordance with strict, international published scientific guidelines for minimising disturbance to cetaceans (e.g., JNCC Guidelines for Marine Mammals 2017).
10	For non-renewable and bioprospecting activities, exploration and development phases must adhere to strict standards for the sector incl. health, safety, and environment. Petroleum activities must comply with Seychelles Model Petroleum Agreement.
11	Motorised devices are prohibited in all Marine National Parks (Zone 1) and Desroches, Poivre, Alphonse, and Farquhar Atoll Marine Sustainable Use Areas (Zone 2; see Outer Island Project) except where authorised for research, essential access and/or infrastructure, enforcement, safety and/or rescue. Prohibited motorised devices include, but are not limited to, personal watercraft (jet skis), underwater scooters, hovercraft, hover boards, motorised paddleboards, submersibles, underwater drones, and other motorised self-contained, underwater devices for leisure. Personal watercraft are conditionally allowable in the remaining Zone 2 areas and need to meet the details on specifications of personal watercraft that are allowable in Zone 2 areas and operate only in the allowable location(s) outside a lagoon and shallow waters that are included in the regulations (SMSA) and/or Marine Sustainable Use Area management plans. Personal watercraft should not operate within reef zones 150 m from high water mark as per international best practice. All other motorised devices are prohibited in Zone 2.
14	No activity on Fish Aggregating Devices (FADs) and/or instrumented buoys by supply vessels except recovery. Certificate of authorisation required from SFA.
16	The type and extent of activities offered by a Hire Craft licence may be limited, depending on the area objectives.
17	In compliance with Seychelles, legislation, regulations, policies, management plans, agreements, and harvest strategies for fisheries monitoring. Fisheries monitoring includes, and is not limited to, human observers, electronic monitoring systems (EMS), vessel monitoring systems (VMS).
19	Only for essential access and/or essential infrastructure for the zone, including enforcement, safety and/or rescue. Considerations for essential access and infrastructure development include emergencies and whether an activity has fewer known impacts to the marine environment than to the terrestrial environment.
22	In compliance with Seychelles, legislation, regulations, policies, management plans, agreements, and harvest strategies for FAD management. FAD management includes,

	and is not limited to, authorisation given by SFA, no unauthorised deployment of FADs, and information to SMSA for anchored FADs
23	In accordance with the Seychelles Aquaculture Master Plan, Seychelles Aquaculture Policy, and other relevant legislation, regulations, policies, management plans, agreements, and strategies.

## SUPPLEMENTARY MATERIALS

DIMSUA Baseline Survey Report

– available online – URL:

Stakeholders analysis Report

- available online – URL: