SCMR Management Plan 2021-2026

Belize Fisheries Department Version

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List of Abbreviations

AGRRA	Atlantic and Gulf Rapid Reef Assessment Protocol
APAMO	Association of Protected Areas Management Organizations
BAS	Belize Audubon Society
BCG	Belize Coast Guard
BDF	Belize Defence Force
BFD	Belize Fisheries Department
BFP	Biodiversity Finance Plan
BIOFIN	Biodiversity Finance Initiative
BTB	Belize Tourism Board
BTIA	Belize Tourism Industry Association
CBD	Convention on Biological Diversity
FUNDAECO	Fundación para el Ecodesarrollo y la conservación
GOB	Government of Belize
GSDS	Growth and Sustainable Development Strategy (Belize)
HRI	Healthy Reefs Initiative
IUCN	International Union for Conservation of Nature and Natural Resources
NBIO	National Biodiversity Office
NBSAP	National Biodiversity Strategy and Action Plan
NPAS	National Protected Areas System
NPASP	National Protected Areas System Plan
PA	Protected Area
PACT	Protected Areas Conservation Trust
SCMR	Sapodilla Cayes Marine Reserve
SEA	Southern Environmental Association
TIDE	Toledo Institute for Development and Environment
TNC	The Nature Conservancy
WWF	World Wildlife Fund

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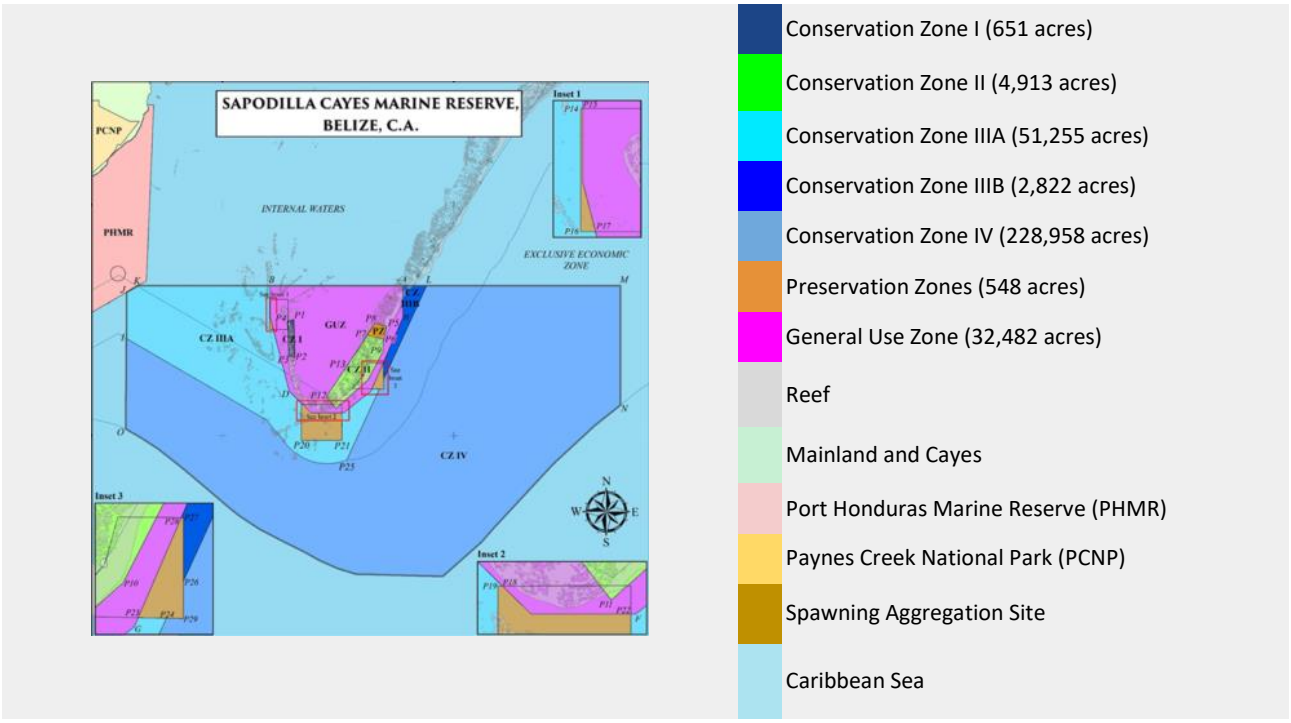
1.0 Introduction

Protected areas play a critical role in conserving biodiversity and promoting sustainable development. Agricultural systems depend upon biodiversity to sustain genetic plant and animal diversity, to provide pollination services, and to maintain irrigation services. Citizens depend upon biodiversity to provide clean drinking water and key ecosystem services including erosion control. Nations depend on biodiversity to ensure food security and on the natural infrastructure of coral reefs, seagrass beds, and mangroves to buffer them from the impacts of climate change, including sea-level rise and increased storm surges. A Reef Insurance scheme from MarFund has been established in an effort to protect biodiversity. A national insurance such as a parametric insurance to allow for funds to be deployed in the event of natural disasters such as hurricanes. Damage assessment from groundings and oil spills is done in cooperation with the DOE. BFD provides technical assistance and the Department of the Environment (DOE) currently fines. Fisheries Resources Regulations may change the penalty system for grounding.

1.1 Background and Context

Sapodilla Cayes Marine Reserve is the most southern of the marine protected areas in Belize, and encompasses the southernmost tip of the Belize Barrier Reef. The reserve covers an area of 321,623.5 acres (approximately 130,156 ha) and contains fourteen palm-fringed sand or mangrove cayes, fringe reefs, natural lagoons, and key spawning aggregation sites (SPAGs). Currently, the Belize Fisheries (BFD) is training personnel to respond to disasters and conduct rapid assessments of the Reserve. Quick restoration efforts (e.g. debris removal, coral replacement, and reconstruction) have also been made.

Figure 1: Map of the SCMR



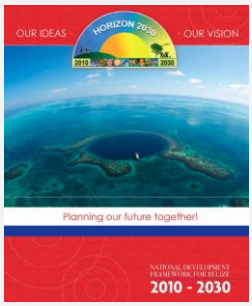
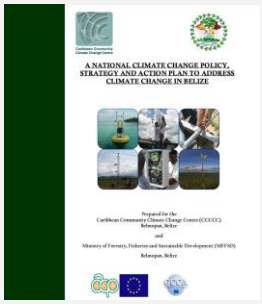
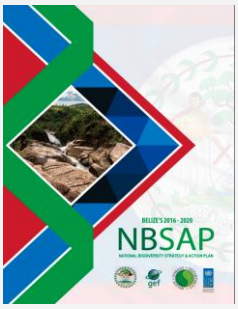
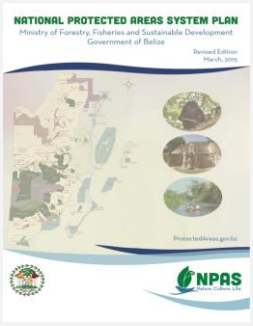
Ecosystem Importance - The reserve forms part of the Southern Belize Barrier Reef Complex (SBBRC), one of the 17 barrier reef regions that compose the Mesoamerican Reef System. The reef system is home to more than 65 species of stony coral, 350 species of mollusk and more than 500 species of fish.[1] There are numerous species that live in or around the reef system that are endangered or under some degree of protection, including the following: sea turtles (green sea turtle, loggerhead sea turtle, leatherback turtle, and the hawksbill turtle), the queen conch, the West Indian manatee, the splendid toadfish, the American crocodile, the Morelet's crocodile, the Nassau grouper, elkhorn coral, and black coral.

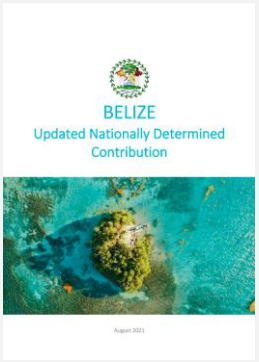
Cultural Importance - The area is a source of pride and income for many coastal communities including some of the earliest fishing communities established in the country such as Monkey River, Punta Negra, Mango Creek and Cattle Landing. Generations of fishermen continue to fish the area, generating income for the country through exports, and also ensuring food security for thousands of Belizeans, particularly in southern Belize.

Economic Importance - Between one and two million people depend directly on the Mesoamerican Reef and its surrounding areas for marine resources and livelihoods.[2] The user base is incredibly diverse, with representation of Miskito, Garifuna, Caribbean Creole, Q'eqchi', Mopan, Yucatec Maya and Mestizo people. The system helps support around US $6.2 billion per year through tourism, commercial fishing and coastal development across Belize, Guatemala, Honduras and Mexico. In Belize, the fisheries sector accounts for 9% of all primary sector output, amounting to more than US $12.4 in income generated primarily by small fishermen across the country. The protection and conservation of Belize's National Protected Areas System (NPAS) is a critical success factor for sustainable development. This management plan is just one part of a broad, collective effort to ensure that Belize's natural resources are protected for generations to come. The importance of Belize's biodiversity cannot be understated - national objectives for conservation revolve around the protection, conservation and rational use of Belize's natural resources within the context of sustainable human development. These objectives are supported by a variety of national policies that seek to coordinate private and public sector efforts to achieve sustainable development and positive environmental impacts (see below).

[1] Source: World Wildlife Fund (WWF) (2021)
[2] Source: Ibid.

Table 1: National Development Priorities and Guiding Documents

	**Horizon 2030** - the national development framework which was developed after extensive stakeholder consultation inclusive of all political parties. One of its four main pillars is responsible environmental stewardship. The strategies to achieve this pillar, namely integrating environmental sustainability into development planning and promoting sustainable energy for all, address the areas of concern relating to Belize's emission profile.
	**The National Climate Change Policy, Strategy And Action Plan** (NCCPSAP), 2015-2020 - provides policy guidance for the development of an appropriate administrative and legislative framework, in harmony with other sectoral policies, for the pursuance of a low-carbon development path for Belize. In addition, the NCCPSAP also seeks to encourage the development of the country's Nationally Determined Contribution and to communicate it to the UNFCCC.
	**The National Biodiversity Strategy And Action Plan (NBSAP)** 2016-2020- documents the current status of biodiversity in Belize, identifies the threats and underlying drivers of biodiversity loss, and presents the strategies required for reducing pressures, safeguarding ecosystems, ecosystem services and species, and improving benefits for the people of Belize.
	**The National Protected Areas Policy And System Plan** underscores the fundamental role of the protected areas network as a pillar in national economic development and defines a roadmap for effective integrated management of terrestrial, coastal and marine resources at the scale of functioning ecosystems.
	**Biodiversity Finance Plan** - The BFP is a Resource Mobilization Plan (RMP), which serves to guide the pooling and allocation of resources for the implementation of Belize's NBSAP targets and UNDP BIOFIN finance solutions. The NBSAP requires BZ $70.3MN to achieve all NBSAP targets and BZ $49.8MN to achieve prioritized NBSAP targets. The BFP proposes the implementation of a full suite of biodiversity finance solutions to assist in funding the cost of implementing Belize's NBSAP and prioritized NBSAP targets.



Updated National Contributions - Belize's updated Nationally Determined Contribution under the Paris Climate Change Agreement represents the country's commitment to tackle the global impacts of climate change. It outlines Belize's strategic plan for reducing emissions and ensuring positive climate outcomes through greater resource mobilization, research, collaboration, and transparency.

Threats - Unfortunately, the reserve continues to face threats from human action and inaction. Large-scale agricultural production in Belize, Guatemala and Honduras leads to agricultural runoff that can alter natural patterns of sedimentation and erosion. Illegal and unsustainable fishing practices continue to threaten the vitality of commercial and recreational species which thousands of Belizeans depend on for income and food security. To make matters worse, climate change continues to reduce the time on hand to effectively cope with and mitigate ecosystem impacts. Carbon emissions and warmer temperatures continue to fuel ocean acidification which smothers coral reef communities and alters wildlife reproductive cycles.[3]

Table 2: Climate Change Impacts and Outlook

Impacts	Current status	Outlook
Sea level rise[4]	Increased global average sea level rise rate of 3.4mm per year since 1993.[5]	Global mean sea level (GMSL) is projected to rise between 0.18 m and 0.23 m by 2050.
Sea surface temperature rise	The average global sea surface temperature has increased about 1.5°F since 1901, an average rate of 0.13°F per decade. The average global SST has been consistently higher during the past three decades than at any other time since reliable records began in 1880.[6]	During the near term (2021–2040), a 1.5°C increase in global surface temperature, relative to 1850–1900, is very likely to occur given the current rate of increase in GHG emissions.
Increased frequency of storms	Increased storms from 1999 onwards, with annual fluctuations. More storms during El Niña, fewer El Niño.	There will be an increasing occurrence of some extreme events unprecedented in the observational record with additional global warming, even at 1.5°C of global warming. The proportion of intense tropical cyclones (categories 4-

[3] Source: IPCC (2021)
[4] Chart on sea level rise can be found via the following link: https://climateknowledgeportal.worldbank.org/country/belize/impacts-sea-level-rise
[5] Source: Simpson, M. C. et al. (2021)
[6] Source: NEEF (2021)

		5) and peak wind speeds of the most intense tropical cyclones are projected to increase at the global scale with increasing global warming.
Ocean acidification	Since 2011, GHG concentrations have continued to increase in the atmosphere, reaching annual averages of 410 ppm for carbon dioxide (CO2), 1866 ppb for methane (CH4), and 332 ppb for nitrous oxide (N2O) in 2019. Land and ocean have taken up a near-constant proportion (globally about 56% per year) of CO2 emissions from human activities over the past six decades.[7]	Upper ocean stratification, ocean acidification and ocean deoxygenation will continue to increase in the 21st century, at rates dependent on future emissions.
Changes in precipitation	The portion of the global land experiencing detectable increases or decreases in seasonal mean precipitation is projected to increase. It is very likely that rainfall variability related to the El Niño–Southern Oscillation is projected to be amplified by the second half of the 21st century.[8]	It is very likely that heavy precipitation events will intensify and become more frequent in most regions with additional global warming. At the global scale, extreme daily precipitation events are projected to intensify by about 7% for each 1°C of global warming.
Air temperature	Each of the last four decades has been successively warmer than any decade that preceded it since 1850. Global surface temperature in the first two decades of the 21st century (2001-2020) was 0.99 [0.84-1.10] °C higher than 1850-1900.	Global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO2 and other greenhouse gas emissions occur in the coming decades.[9]

[7] Source: IPCC (2021)
[8] Source: Ibid.
[9] Source: Ibid.

1.2 Purpose and Scope of Plan

This is the fourth management plan developed for the Sapodilla Cayes Marine Reserve, the first being completed in 1996. The last management plan covered the years 2011-2016 and was implemented jointly by the Belize Fisheries Department and the Southern Environmental Association (SEA). The programmes in this Management Plan defines the current status of the Marine Reserve and its environs and outlines the potential co-manager and the BFD's strategy for promoting participatory monitoring and management of the reserve to ensure positive biodiversity outcomes. The management plan also serves as the guiding document for Green List Certification by the International Union for the Conservation of Nature (IUCN), which prioritizes Good Governance, Sound Design and Planning, Effective Management, and Successful Conservation Outcomes (see below).

Figure 2: IUCN Green List Standard

The Plan has been prepared with the input of various stakeholders from both the public and private sectors. Information collected through consultations with a wide variety of individuals, including fishermen, tour operators, community members, management and operational staff, and researchers has informed key management programs and activities. The Plan includes information on the:

- Physical and biological attributes of the SCMR,
- Current uses of the natural resources within the reserve,
- Threats to ecological integrity,
- Management effectiveness,
- Management capacity, and
- Goals and objectives for the SCMR

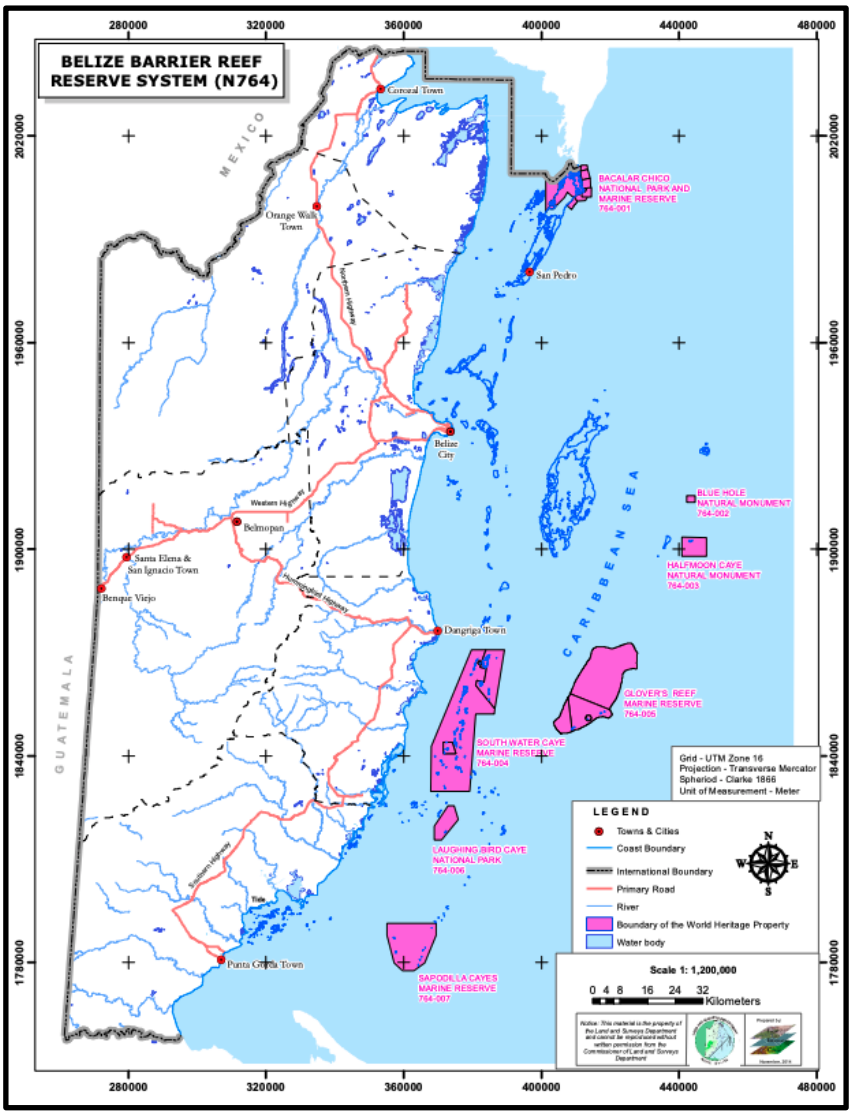
The management programmes are based on the latest data and scientific information, and are aligned to maximize the resources available for conservation. This management plan is designed to guide the management of the Marine Reserve through the next five years (2021-2026) by providing a framework for both broad management activities as well as more specific research and monitoring activities. The Belize Fisheries Department and the BFD are committed to sustainable management practices and transparency.

2.0 Current Status

2.1 Location

The Sapodilla Cayes Marine Reserve (SCMR) is the most southern of the marine protected areas in Belize, and encapsulates the southernmost tip of the Belize Barrier Reef. It lies in the general area of N16 6 32.9, W88 16 10.4 and is an integral part of the Belize Barrier Reef Reserve System (BBRRS), inscribed as a UNESCO World Heritage Site in 1996.[10]

Figure 3: Belize Barrier Reef System[11]



The SCMR was established as a protected area via Statutory Instrument (SI) 117 of 1996, encompassing an area of 38,595 acres (approximately 15,619 ha). The reserve houses a shallow

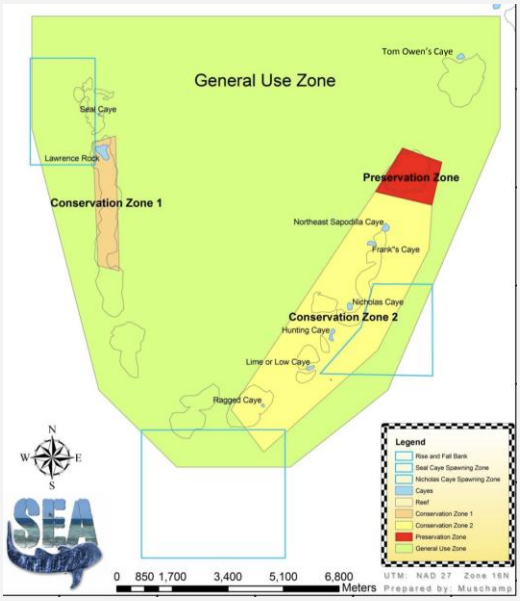
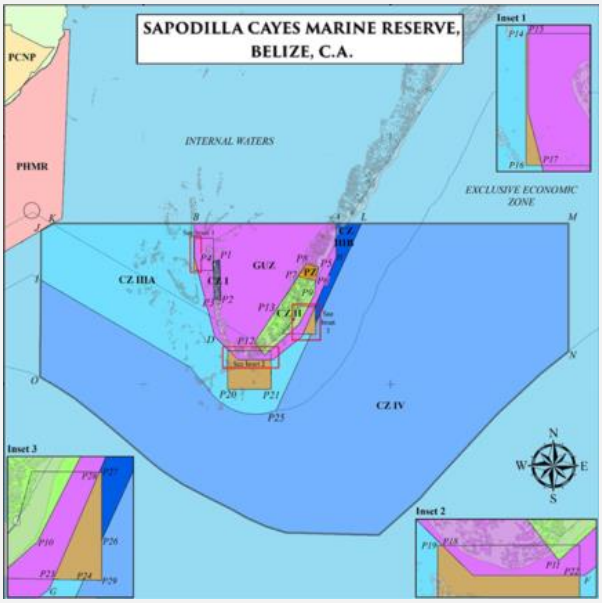
[10] Source: UNESCO (2021) https://whc.unesco.org/en/list/764/

[11] Source: Land and Surveys Department Belize (2014)

reef and several atoll lagoons as well as the reserve's namesake Sapodilla Cayes. The shallow coral gardens found within the reserve are inhabited by various endemic, unique and endangered species of coral, fish, dolphins, sea turtles and manta rays. The reserve also includes spawning sites for the endangered Nassau grouper, Goliath grouper, Tiger grouper, Black grouper, Cubera snapper, Mutton snapper and various species of shark. These spawning aggregation sites are critical for the replenishment of numerous commercially important fish species.

Initially established to cover a total of 38,594 acres (approximately 155 square kilometers), the SCMR was redesignated via SI 107 of 2020, repealing SI 117 of 1996 and SI 50 of 2009, which expanded the reserve's coverage to 321,632 acres (approximately 1,301.6 square kilometers). Figure 4 provides an illustration of the original boundaries of the reserve, prior to expansion.

Figure 4: Sapodilla Cayes Marine Reserve (pre and post-expansion)[12]

Pre-expansion	Post-expansion
	

By expanding the protected area, 12% of Belize's marine landscape is currently under some form of legal protection, an affirmation of the country's commitment to Aichi Target 11 which calls for the conservation of at least 10% of coastal and marine areas. A key motivating factor for the expansion of the reserve was to offer direct protection to the Cayman Crown Reef, known as the 'Corona Reef', which is currently one of the healthiest reef ecosystems in the Caribbean.[13] Figure 4 provides an illustration of the present boundaries, post-expansion.

[12] As originally defined as per SI 117 of 1996 and SI 50 of 2009.

[13] Source: GOB. 2020. [Press Release] Expansion of the Sapodilla Cayes Marine Reserve to Protect Important Reef Ecosystem

Additions to the reserve include:[14]

1. Conservation Zone IIIA - 51,254.6 acres (207.38 square kilometers)
2. Conservation Zone IIIB - 2821.9 acres (11.42 square kilometers)
3. Conservation Zone IV - 228,953 acres (926.54 square kilometers)

SI 108 of 2020 establishes the activities that are allowable and restricted within the reserve, ensuring that all are contributing to effective natural resource management of the Reserve. SI 108 also establishes an Advisory Committee for the purpose of assisting in the management of the Reserve.

The Reserve is of importance to several stakeholders including the private sector, research institutes, coastal authorities and agencies and fisher folks from nearby coastal communities. Within the reserve, all islands within the reserve are privately owned with the exception of some islands that are leased by the government. Hunting Caye, which is publicly owned, has traditionally served as a base for on-site reserve management staff, and the University of Belize research facility, which occasionally hosts visiting students and researchers. Port Authority staff and Belize Coast Guard officers also use the caye as a strategic monitoring site for maritime traffic.

Whilst there are no communities directly adjacent to the SCMR, several are considered as stakeholders. Local fishermen from Monkey River, Punta Negra, Barranco and Punta Gorda have been operating within the reserve area from temporary camps on the cayes for more than 40 years.

2.2 Regional Context

The Sapodilla Cayes Marine Reserve (SCMR) is part of the Meso-American Reef (MAR) system which contains the largest barrier reef in the Western Hemisphere, stretching nearly 700 miles from the northern tip of the Yucatan Peninsula down through the Honduran Bay Islands. The MAR is of global importance and is prioritized for conservation action because it helps stabilize and protect coastal landscapes, maintain coastal water quality, sustain commercial species, and provide employment in the fishing and tourism industries to more than a million people living in coastal areas.[15]

The SCMR contains important ecosystems of high biodiversity, providing habitats for many species of global conservation concern including staghorn and elkhorn coral (Acropora cervicornis and Acropora palmata), the hawksbill turtle (Eretmochelys imbricata), the loggerhead turtle (Chelonia mydas and Caretta caretta), and the goliath grouper (Epinephelus itajara). Commercially important species, including the Queen Conch (Strombus gigas), the spiny lobster (Panulirus argus), and various species of fin fish are also found within the reserve.

[14] Detailed geographic descriptions are provided and more fully described using the North American Datum of 1927 (NAD27) and scaling all coordinates, in metres, on Zone 16 of the Universal Transverse Mercator (UTM) projection in Annex A.

[15] Source: Global Environment Facility (2001)

Belize's Vision 2030 promotes sustainable development whilst preserving and conserving its natural capital and establishing a domestic framework for achieving sustainability. Vision 2030 supports Belize's commitment to several international conventions/ agreements designed to conserve biodiversity that are also of relevance to the SCMR (See Table 3).

Table 3: International Conventions/ Agreements

Convention/ agreement	Description
Convention on Biological Diversity (Rio de Janeiro, 1992) Ratified in 1993	To conserve biological diversity to promote the sustainable use of its components, and encourage equitable sharing of benefits arising from the utilization of natural resources.
Alliance for the Sustainable Development of Central America (ALIDES) (1994)	Regional alliance supporting sustainable development initiatives.
Central American Commission for Environment and Development (CCAD) (1989)	Regional organization of Heads of State formed under ALIDES, responsible for the environment of Central America. Initiated Mesoamerican Biological Corridors and Mesoamerican Barrier Reef Systems Programmes.
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena de Indias, Colombia, 1983) Ratified in 1999	Regional convention with the objective of protecting the marine environment of the Wider Caribbean through promoting sustainable development and preventing pollution.
Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)	The World Heritage Convention requires parties to take steps to identify, protect and conserve the cultural and natural heritage within their territories.
International Convention for the Protection and Conservation of Sea Turtles for the Western Hemisphere (December 21st, 1997)	To protect and conserve sea turtle species of the Western Hemisphere.
The UN Convention on the Law of the Sea (1982)	The Law of the Sea Convention defines the rights and responsibilities of nations in their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	To ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species.

Aligned with the various conventions and strategies for supporting sustainable development and the preservation and conservation of the environment, the Sapodilla Cayes Marine Reserve is recognized, from as early as 1996, as one of the seven sites that comprise the Belize Barrier Reef System - World Heritage Site under the Convention Concerning the Protection of World Culture and Natural Heritage. The SCMR is categorized as a habitat/ species management area (IUCN

Category IV) with the objective to maintain, conserve and restore species and habitats. See Table 4 for the seven sites that comprise the Belize Barrier Reef System and the IUCN category assigned to each.

Table 4: BBRS and IUCN Categories

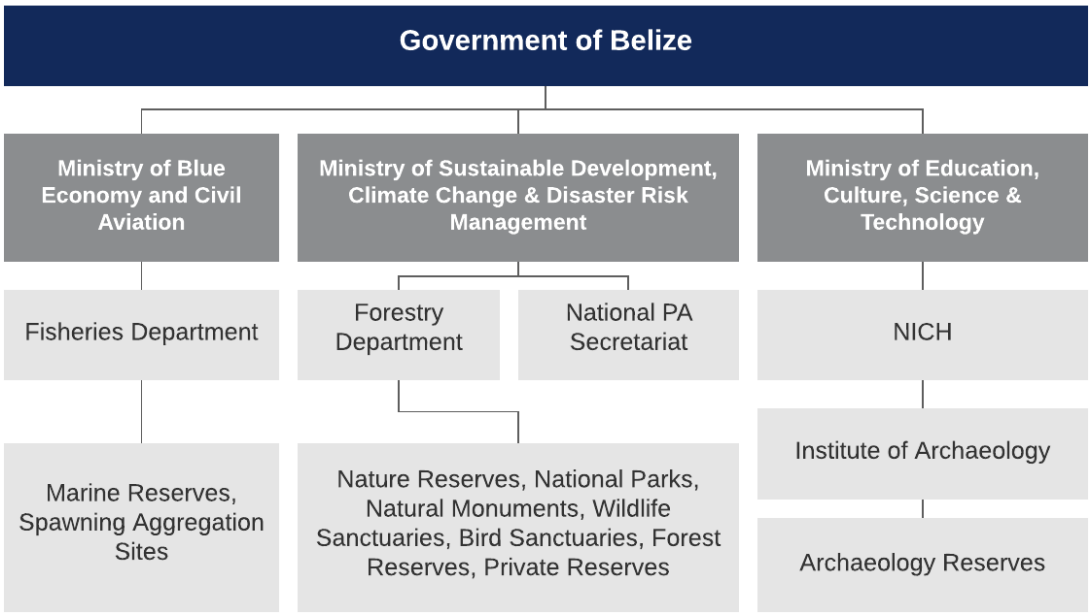
Site	IUCN Category
Bacalar Chico National Park and Marine Reserve II (National Park)	II (National Park) IV (Habitat/Species Management Area)
Laughing Bird Caye National Park	II (National Park)
Half Moon Caye Natural Monument	III (Natural Monument)
Blue Hole Natural Monument	III (Natural Monument)
Glover's Reef Marine Reserve	IV (Habitat/Species Management Area)
South Water Caye Marine Reserve	IV (Habitat/Species Management Area)
Sapodilla Cayes Marine Reserve	IV (Habitat/Species Management Area)

2.3 National Context

2.3.1 Legal and Policy Framework

Belize's protected areas fall under a range of categories within a largely decentralized system with management activities shared between different government departments and several NGOs or CBOs. Protected areas are managed separately by three lead ministries: the Ministry of Education, Culture, Science & Technology, the Ministry of Blue Economy and Civil Aviation, and the Ministry of Sustainable Development, Climate Change & Disaster Risk Management. Ministerial departments share the responsibility of managing the different areas (see Figure 5), including Archaeological Reserves, Natural Reserves, National Parks, Natural Monuments, Wildlife Sanctuaries, Forest Reserves, Marine Reserves and spawning aggregation sites.

Figure 5: Government Agencies with Legal Jurisdiction over Protected Areas



The national protected areas system consists of an aggregation of protected areas with different management categories defined by supporting legislation including the National Parks Act; the Private Forest Conservation Act; the Forest Act Chapter 213 and the Wildlife Protection Act of 1982 Chapter 220.[16] Table 5 provides existing PA categories, allowed uses, and objectives.

[16] For a detailed list of relevant Acts and legislation, please see Annex B

Table 5: Existing PA Classifications[17]

PA Category	Allowed Use Summary	Objective
Nature Reserve	Very restrictive, no uses "except with the authorization of the Administrator"	For scientific study, monitoring, education and the maintenance of genetic resources.
National Park	Very restrictive, no uses "except with the authorization of the Administrator"	For the protection and preservation of natural and scenic values of national significance for the benefit and enjoyment of the general public.
Archaeological Reserve	Search, exploration, excavation; restoration; import, sell or trade; removal of earth or stone.	An area designated for protection of historical archeological importance.
Natural Monument	Very restrictive, no uses "except with the authorization of the Administrator"	To provide opportunities for interpretation, education, research and public appreciation.
Wildlife Sanctuaries	Very restrictive, no uses "except with the authorization of the Administrator"	For the perpetuation and sustainability of necessary natural habitats for endemic species
Bird Sanctuaries	Very restrictive, no uses	For the protection of key bird nesting and roosting sites.
Marine Reserves	"allow for extractive and non-extractive use, conservation protection, use concentrating on sustainable fishing, tourism, research and education."	To promote scientific study and research in respect of such areas; to preserve and enhance the natural beauty of such areas.
Forest Reserves	The most "uses" allowed in terms of products: forestry, cattle ranching; hunting; quarrying stone, burning lime or charcoal. In fact "collecting, manufacturing or removing any forest produce"	"for the protection of trees and forest produce"

The Fisheries Department, under the Ministry of Blue Economy and Civil Aviation, is responsible for the establishment and management of eight (8) marine reserves in Belize along with eleven (11) spawning aggregation sites. Activities within marine protected areas are governed by the Fisheries Resources Act of 2020 which regulates commercial fishing, marine resource exportation and scientific research activities. In total, there are 13 marine protected areas (MPAs) within Belize

[17] Source: Sustainable Finance Strategy and Plan for the Belize Protected Area System (2011)

covering three (3) classes of protected areas: marine reserves, wildlife sanctuaries, and forest reserves (See Table 6).

Table 6: Marine Protected Areas

Protected Area	Site Management Agency	IUCN Category	Established-SI	Size (acres)
Bacalar Chico Marine Reserve	Fisheries Department	IV	1996-88	15,529
Caye Caulker Marine Reserve	Fisheries Department	VI	1998-35	9,670
Gladden Spit Silk Cayes Marine Reserve	Southern Environmental Association	IV	2003-95	25,978
Glover's Reef Marine Reserve	Fisheries Department	IV	1996-70	86,653
Hol Chan Marine Reserve	Fisheries Department / Hol Chan Trust	II	1987-57	102,400
Port Honduras Marine Reserve	Toledo Institute for Development and Environment	IV	2000/9	100,000
Sapodilla Cayes Marine Reserve	Fisheries Department	IV	1996-117	38,594
South Water Caye Marine Reserve	Fisheries Department	IV	1996-118	117,875
Turneffe Atoll Marine Reserve	Turneffe Atoll Sustainability Association	IV	2012	325,412
Blue Hole Natural Monument	Forest Department/ Belize Audubon Society	III	1996-96	947
Half Moon Caye Natural Monument	Forest Department/ Belize Audubon Society	II	1982-30	9,771
Caye Caulker Forest Reserve	Forest Department	VI	1998-28	94
Swallow Caye Wildlife Sanctuary	Forest Department/ Friends of Swallow Caye	IV	2002/102	8,972

There is also legislation that enables revenue generation from departure taxes and conservation fees levied on cruise-ships and overnight visitors to Belize. This revenue is channeled toward conservation through the Protected Areas Conservation Trust (PACT) and other partnering non-governmental organizations (NGOs). PACT was established in January 1996 with the passing of the Protected Areas Conservation Trust Act, Chapter 218, Revised Edition 2003 and it provides for the generation and collection of revenues, and for the disbursement of a portion of these funds to projects which are in alignment with PACT's mission and Belize's conservation and sustainable development priorities. The PACT is funded principally through two mechanisms: a conservation fee of BZ $7.50 (US $3.75) charged at the point of departure on all visitors to Belize (Section 33) and a 20% commission charged on cruise ship passenger fees (Section 21). The PACT Act grants PACT the ability to collect these fees in addition to entrance fees across the entire National Protected Areas System. PACT works with a network of conservation NGOs in the country to ensure biodiversity conservation.

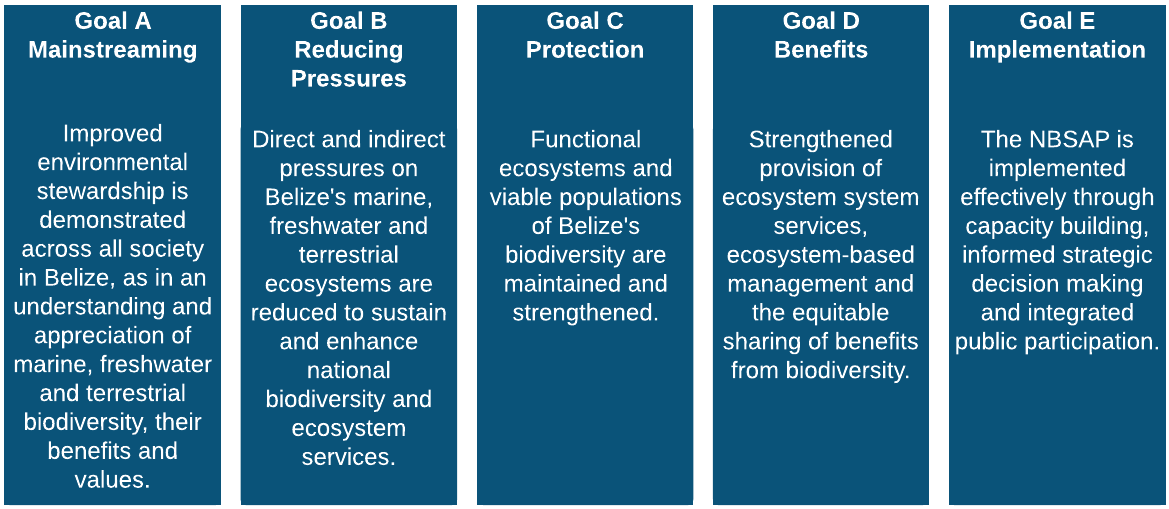
In addition to protected areas legislation, there are a number of laws designed to protect wildlife and national heritage that support biodiversity conservation. For example, the Environmental Protection Act (1992) was developed with the aim of ensuring that development initiatives within Belize are planned for minimum environmental impact. The Act grants the Department of the Environment broad regulatory and enforcement authority for the prevention and control of environmental pollution, conservation and management of natural resources, and environmental impact assessment (EIA). Potential developments are regulated by the Environmental Impact Assessment Regulations (SI 105 of 1995) which control and regulate the EIA process. Under this framework, potential developers must conduct and submit an EIA of their designated project(s) to the DOE for approval. If approved, an Environmental Compliance Plan (ECP) is developed to ensure long-term environmental sustainability of the project(s). The Department of the Environment is also responsible for responding to human impacts on the reef, such as pollution, boat groundings and fuel spills.

Additional supporting legislation includes the Forest (Protection of Mangrove) Regulations (SI 52 of 1989, under revision, 2009), which provide for the protection of mangroves, with restrictions on mangrove alteration and/ or clearance; the Wildlife Protection Act (SI 12 of 1982, revised 2000) which provides protection for a number of marine species (e.g. West Indian manatee, whales and dolphins), with the prohibition of hunting and commercial extraction; the Mines and Minerals Act (1989) and the Petroleum Act (1991) which collectively regulate the exploration and extraction of all non-renewable resources, including petroleum; and the Belize Port Authority Act, 1976, revised, 2003 which regulates the registration of marine vessels and maritime traffic in Belizean waters.

In an effort to enhance inter-ministerial communication and streamline system-level protected areas management, the National Protected Areas Policy and System Plan was developed in 2005, and revised in 2015, with the objective to ensure that the potential contribution of the protected areas system to national development and poverty alleviation is maximized. As part of the NPASP, a National Protected Areas Committee (NPAC) was established which includes representatives from different Ministries in an attempt to bridge communication gaps, coordinate activities, avoid the duplication of efforts, and align conservation priorities with national development priorities.

In 2016, environment, biodiversity, and ecosystem health was incorporated as a national development priority through the National Biodiversity Strategy and Action Plan (NBSAP) 2016-2020. The NBSAP was designed as a five (5) year plan set within a fifteen year framework (in alignment with Horizon 2030), and was designed to achieve effective conservation, management, and protection of Belize's natural environment through the five (5) thematic areas outlined in Figure 6.

Figure 6: NBSAP Thematic Areas



More recently, a National Biodiversity Office (NBIO) was established in Belize with the aim of managing and coordinating biodiversity action within the MSDCC&DRM[18]. The NBIO will facilitate collaboration across the various government ministries and departments, NGOs and the private sector. The establishment of the NBIO is a direct outcome of the BIOFIN Belize rationalization exercise commenced in 2018 which consisted of three (3) assessments: (1) Policy and Institutional Review (PIR), (2) Expenditure Review (BER), and (3) Financial Needs Assessment (FNA). These assessments informed the development of Belize's Biodiversity Finance Plan (BFP) which proposes a suite of biodiversity finance solutions, which are capable of raising the financial and other resources required to achieve the country's biodiversity targets in accordance with the activities of the National Biodiversity Strategy and Action Plan (NBSAP), the long-term development strategy Horizon 2030, and the Sustainable Development Goals (SDGs).

National Planning Strategies

National objectives for conservation revolve around the protection, conservation and rational use of Belize's natural resources within the context of sustainable human development. These objectives are supported by a variety of national policies that seek to coordinate private and public sector efforts to achieve sustainable development and positive environmental impacts. More specifically, relevant policies include:

Table 7: Key Policies

Policy/ strategy	Description
Horizon 2030	National development framework which was developed after extensive stakeholder consultation inclusive of all political parties. One of its four main pillars is responsible environmental stewardship. The strategies to

[18] Ministry of Sustainable Development, Climate Change and Disaster Risk Management

	achieve this pillar, namely integrating environmental sustainability into development planning and promoting sustainable energy for all, address the areas of concern relating to Belize's emission profile.
National Energy Policy Framework	Aims to provide options that Belize can pursue for energy efficiency, sustainability and resilience over the next 30 years. Additionally, the Sustainable Energy Action Plan is a tool to achieve Belize's renewable energy and energy efficiency potential while meeting the Government's economic, social and environmental goals. It provides a framework of actions and tasks to overcome barriers to sustainable energy for the period 2014-2030.
The National Climate Resilience Master Plan 2013	Provides the framework for an efficient, productive and strategic approach to building economic and social resilience and development. Special importance is given to building climate resilience and reducing disaster risk.
The Growth And Sustainable Development Strategy	The guiding development plan for the period 2016–2019. It adopts an integrated, systemic approach and encompasses medium-term economic development, poverty reduction and longer-term sustainable development issues. This planning document also provides detailed guidance on priorities and on specific actions to be taken during the planning period, including actions that contribute to longer term development objectives beyond 2019.
The National Climate Change Policy, Strategy And Action Plan (Nccpsap), 2015-2020	Provides policy guidance for the development of an appropriate administrative and legislative framework, in harmony with other sectoral policies, for the pursuance of a low-carbon development path for Belize. In addition, the NCCPSAP also seeks to encourage the development of the country's Nationally Determined Contribution and to communicate it to the UNFCCC.
Roadmap For The Development Of A Low Carbon Development Strategy	Creates a platform for low carbon growth in new areas while still adhering to the national development targets. The roadmap compliments the NCCPSAP and GSDS by focusing on building technical capacity, strengthening institutions and policies, facilitating public-private partnerships and engaging stakeholders to adopt sustainable practices which should lead to national resilience to the impacts of climate change.
The National Solid Waste Management Policy (Nswmp)	The main public policy instrument regarding the management of solid waste (e.g., municipal, industrial and hazardous types of waste, among others) for Belize. Its overall goal is to ensure that "The system for managing solid wastes in Belize is financially and environmentally sustainable, and contributes to improved quality of life," while also contributing to the promotion of sustainable development by preventing, reusing, recycling or recovering waste wherever feasible and beneficial.
The National Biodiversity Strategy And Action Plan (Nbsap) 2016-2020	Documents the current status of biodiversity in Belize, identifies the threats and underlying drivers of biodiversity loss, and presents the strategies required for reducing pressures, safeguarding ecosystems,

	ecosystem services and species, and improving benefits for the people of Belize.
The National Protected Areas Policy And System Plan	Underscores the fundamental role of the protected areas network as a pillar in national economic development and defines a roadmap for effective integrated management of terrestrial, coastal and marine resources at the scale of functioning ecosystems.
Biodiversity Finance Plan	The BFP is a Resource Mobilization Plan (RMP), which serves to guide the pooling and allocation of resources for the implementation of Belize's NBSAP targets and UNDP BIOFIN finance solutions. The NBSAP requires BZ $70.3MN to achieve all NBSAP targets and BZ $49.8MN to achieve prioritized NBSAP targets. The BFP proposes the implementation of a full suite of biodiversity finance solutions to assist in funding the cost of implementing Belize's NBSAP and prioritized NBSAP targets.

Belize is also leveraging its natural capital to support global efforts to combat climate change. Through it updated Nationally Determined Contribution (NDCs), Belize has identified the following actions and targets:

- Enhance the capacity of the country's mangrove and seagrass ecosystems to act as a carbon sink by 2030, through increased protection of mangroves and by removing a cumulative total of 381 KtCO2e between 2021 and 2030 through mangrove restoration.
- Restore at least 2,000 hectares of mangroves, including within local communities, by 2025, with an additional 2,000 hectares by 2030
- Assess the value of seagrass habitat contributions to climate regulation to inform development and implementation of a national seagrass management policy, updated national seagrass mapping as part of an updated marine habitat map, and identification of a portfolio of priority seagrass areas for protection to enhance conservation
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- Increase resilience to climate impacts for coastal communities and habitats by managing further development of the coastline to reverse net coastal habitat and land loss by 2025
- Build capacity in fisheries and aquaculture sector through research, diversification and retraining to support livelihoods while protecting coastal ecosystems
- Increase the adaptive capacity of tourism sector through the development of climate resilient planning frameworks and infrastructure
- Implement protection targets of the National Biodiversity Strategy Action Plan including increased effectiveness of the National Protected Areas System by 2024

The Sapodilla Cayes Marine Reserve is one of four protected areas within the Southern Belize Reef Complex (SBRC).[19]

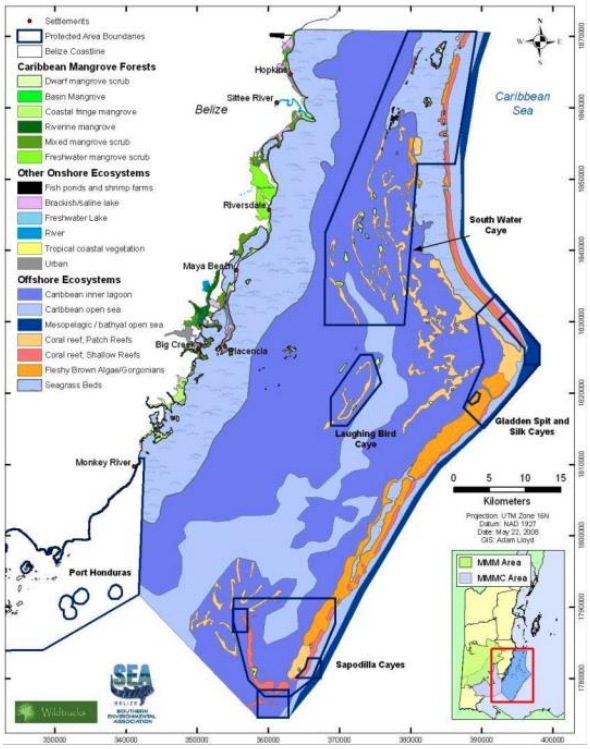
Figure 7: National System Level Management Units[20]

The Southern Belize Reef Complex

The Southern Belize Reef Complex (SBRC) stretches southwards from the northern boundary of the South Water Caye Marine Reserve to the northern boundary of the Port Honduras Marine Reserve, and south-eastwards from the coastline of Belize to the Sapodilla Cayes and the outer reef (Figure 8).

[19] The other MPAs within the SCRC include the South Water Caye Marine Reserve, Gladden Spit and Silk Cayes Marine Reserve and Laughing Bird Caye National Park.
[20] Source: SCMR Management Plan 2011-2016

Figure 8: Southern Belize Reef Complex



This area is characterized by the three (3) primary reef structures - fringing, barrier, and atoll - and contains important cross-shelf habitat linkages and an assemblage of ecosystems considered possibly the most biodiverse in the region. The SBRC is of great scientific value and importance for many species of conservation concern, including the critically endangered hawksbill turtle (Eretmochelys imbricata) and goliath grouper (Epinephelus itajara), and the endangered green and loggerhead turtles (Chelonia mydas and Caretta caretta).[21] Within the SBRC, the estuarine and coastal areas are considered important for the West Indian manatee, whilst the sandy beaches have a history of use as nesting sites for all three marine turtle species. The near shore mangrove nursery areas and seagrass are regionally important for recruitment for a significant number of the commercial marine species.

The expanded reserve now includes an important coral reef ecosystem known as the Corona Reef or Cayman Crown, which straddles the maritime boundary between southern Belize and Guatemala. The Cayman Crown has been described as the most underrepresented habitat in the marine protected areas system of Belize and Guatemala and is believed to be a biologically important hotspot. Initial explorations indicate that the reef supports fish spawning aggregations (FSAs) for numerous fin fish species and habitats for deep-slope snapper and bottom-dwelling species. In 2020, the Cayman Crown was declared protected in both Belize and Guatemala.

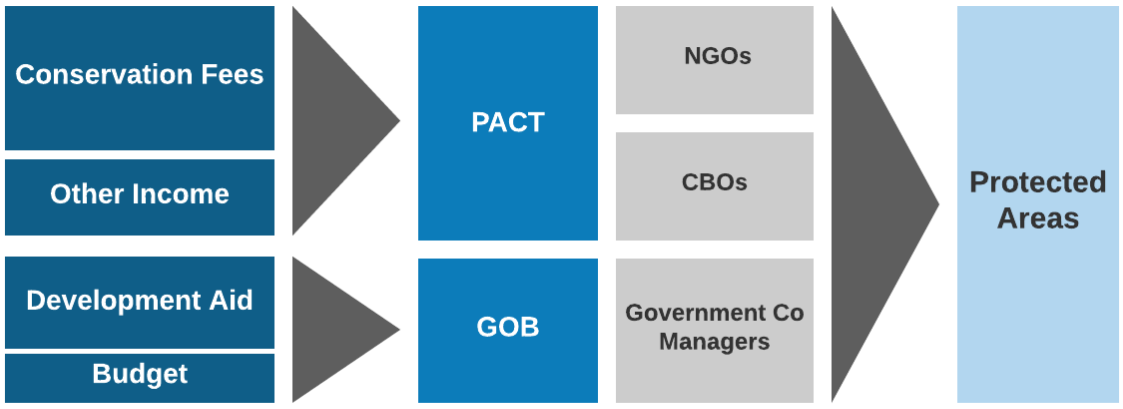
[21] Source: IUCN (2010)

2.3.2 Financing

Protected areas are a major asset to the Belizean economy, contributing millions of dollars in ecosystem derived goods and services every year.[22] Much of the tourism industry is also dependent on PAs. According to the Sustainable Finance Strategy and Action Plan (2011), 70% of visitors to Belize visit a Protected Area during their stay. The two major sources of tourism-based revenue are entrance fees and conservation fees.[23] Additional revenue streams include timber extraction licensing fees, fishing licensing fees, grants and other charitable contributions, and official development aid. In spite of existing revenue generation, resources are often limited and hinder the sustainable management and development of PAs. The ongoing COVID-19 pandemic has further strained PA management by limiting productive activity and consumption across all sectors.

The Belize protected area system is funded through several public and private sector mechanisms. Government budget allocations for PA management are channeled through the Belize Fisheries Department and the Belize Forest Department and have traditionally been used to complement private sector funding. These funds are managed by the GOB and are used to fund enforcement, monitoring and research activities at the various PAs where the GOB is as a manager. However, budget allocations are vulnerable to ministerial discretion and fiscal constraints. Another main funding source for PA managers is from PACT disbursements. The rest includes entrance fees collected at the sites, by government and co-managers, grants, and forestry concessions. (see Figure 9).

Figure 9: PA System Financial Overview



Protected Areas Conservation Trust (PACT)

The PACT serves as a conservation trust fund. PACT provides funds for supporting conservation and promoting environmentally sound management of Belize's natural and cultural resources and

[22] Source: Biodiversity Finance Plan for Belize (2019)

[23] "Conservation fees" is an umbrella term that includes national departure taxes, and Cruise Passenger Taxes.

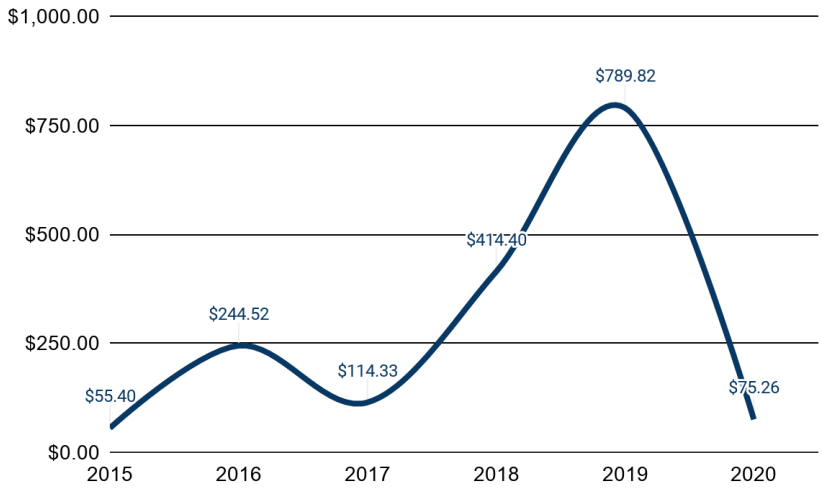
to foster sustainable development. It is funded principally through two mechanisms: a conservation fee of BZ $7.50 (US $3.75) collected as part of the airport departure tax which is currently US$39.25, and a 20% commission[24] from the cruise ship passenger tax of US$7 per person. Using funds obtained from grants and conservation fees, PACT undertakes investment in the National Protected Areas System and Sustainable Development of Belize via the following investment categories[25]:

1. Targeted investments: These investments support the Trust's efforts in meeting the desired priorities for biodiversity and ecosystem protection and revenue generation and financial sustainability. These investments are guided by the Trust's Prioritization Model developed to assist in the implementation of the 2018-2021 Conservation Investment Strategy.
2. Secondary investments: These investments support general PA management and programmes outside of priority areas/ecosystems of the 2018-2021 Conservation Investment Strategy. Support also includes management processes and institutional strengthening tools for PA managers.
3. Third-party investments: These investments flow to local beneficiaries through third-party financial resources. Investments are in the form of partnerships, co-financiers or via a re-granting process for regional and international financing institutions.

With the advent of the COVID-19 pandemic, PACT has had to reduce administration and communications spending by 10% and 50%, respectively, and cut international travel altogether. Additionally, income from development aid fell by more than 90% in 2020 relative to 2019[26]. Figure 10 shows development aid income between 2015 and 2020. Market and industry uncertainty caused by the pandemic forced PACT to restrict more than BZ$6 million of unrestricted cash and to defer 84% of its programmatic budget to the new fiscal year 2021-2022. As an established trust fund with fiduciary responsibility under the laws of Belize, PACT is continuously exposed to credit risks, market risks, liquidity risks, and operational risks. For example, 65% of all revenue to be collected from airline and cruise line remittances remained outstanding due to the pandemic. As economic uncertainty persists because of the pandemic, there is no clear timeframe for receiving these remittances.

Figure 10: Development Aid to PACT (000's BZ$)[27]

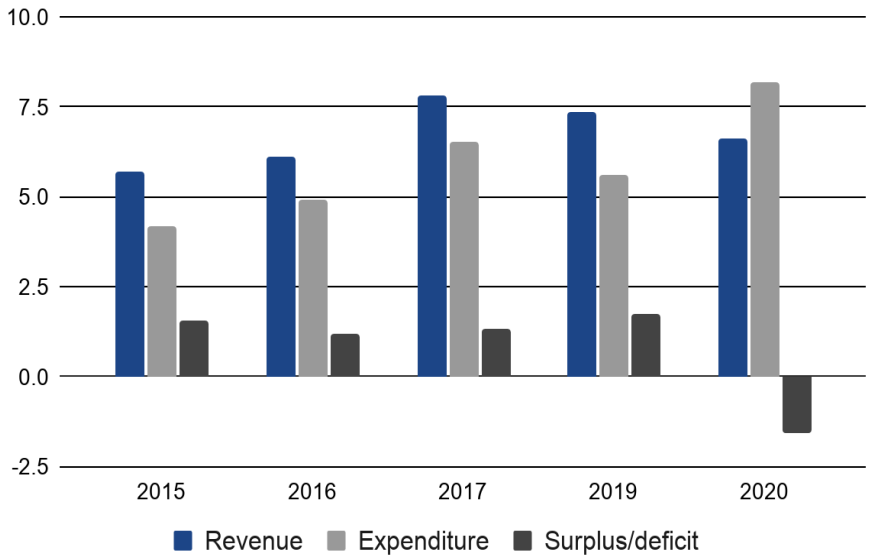
[24] Amounts to US$1.40/person.
[25] PACT Financial Statements for the period ended March 31 2020. Source: PACT (2021)
[26] For the period ended March 31 2020.
[27] PACT 2018-2019 Financial Statement



Income from conservation fees continues to be the primary income earner for PACT, accounting for 55% of all revenue as of March 31, 2020. Expenditures have typically kept pace with revenues as seen in Figure 11[28] with the exception of 2020 due to the COVID-19 pandemic. Because of PACT's exposure, poor risk management and sudden shocks can adversely affect all PA managers who rely on PACT for funding and operational support, hence the need for broader system level coordination on financial management and sustainability.

[28] Source: PACT (2021). Data not available for 2018.

Figure 11: PACT Revenue and Expenditure (million BZ$)

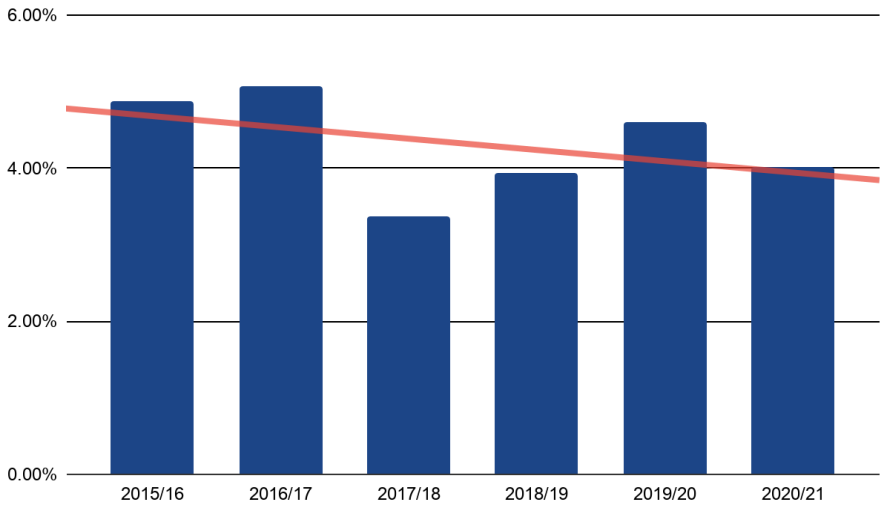


In 2013, Belize transitioned towards a programme-based public budgeting system. Programme-based Budgeting relates cost estimates to programmes using a cross-cutting method rather than attributing costs on a traditional departmental basis relative to traditional budgeting approaches.[29] The budgeting process is coordinated by the Ministry of Economic Development and the Ministry of Finance is the ultimate process owner. Line Ministries submit their budgets with targets and indicators aligned to the Growth and Sustainable Development Strategy (GSDS).[30] Prioritization of submissions is determined based on strategic alignment with the GSDS and macroeconomic and fiscal constraints. Against a backdrop of tempered growth and high debt to GDP levels,[31] the MSDCC&DRM[32], which is the main government agency responsible for the implementation of the NBSAP, has seen its share of the approved budget decline to below 5% in fiscal years 2017/18 and 2018/19 and it is expected to remain at such levels in the medium-term (see Figure 12).

[29] Source: Pigeon (2010)
[30] Source: GOB (2016)
[31] At the time of writing, gross external public debt is roughly 150% of GDP. Source: CBB (2021)

[32] Ministry of Sustainable Development, Climate Change and Disaster Risk Management

Figure 12: Ministry of Sustainable Development Budget (% Govt Budget)[33]



Not all protected areas have the same socio-economic benefit potential or financial requirements. For example, forest and marine reserves are the most permissive in terms of allowable uses and economic opportunities via extraction. Recognizing the socio-economic potential of Belize's marine space, the Ministry of Blue Economy was established to diversify and maximize revenue from marine resource use.

Belize's Biodiversity Finance Plan proposes a suite of biodiversity finance solutions which are capable of raising the financial and other resources required to achieve the country's biodiversity targets in accordance with the activities of the National Biodiversity Strategy and Action Plan (NBSAP), the long-term development strategy Horizon 2030, and Belize's Nationally Determined Contributions to the Sustainable Development Goals (SDGs). Belize's BFP outlines several alternative financing mechanisms that are available to PA managers and CBOs. These include:

1. Strengthening Environmental Funds Up-scaling existing EF's in Belize, i.e. bringing management operations in line with international best practices to improve effectiveness;
2. Green Debt Tax subsidies to financial institutions that lend money for 'green' projects;
3. Crowdfunding Pooling donation revenues from willing parties and individuals for the sustainment of PAs in Belize;
4. Compensation for Planned Environmental Damage requires developers to carry out restoration of critical areas to offset damage/ degradation of landscapes caused by their development project.
5. Debt-for-Nature Swap donors purchase commercial debt, or creditors agree to provide debt service relief in exchange for conservation and sustainable management of critical ecosystems.
6. Carbon Market Trading (exporting) emission offsets generated by NPAS and ecosystem conservation by private landowners.

[33] Source: GOB (2020)

2.3.3 Land and Sea Tenure

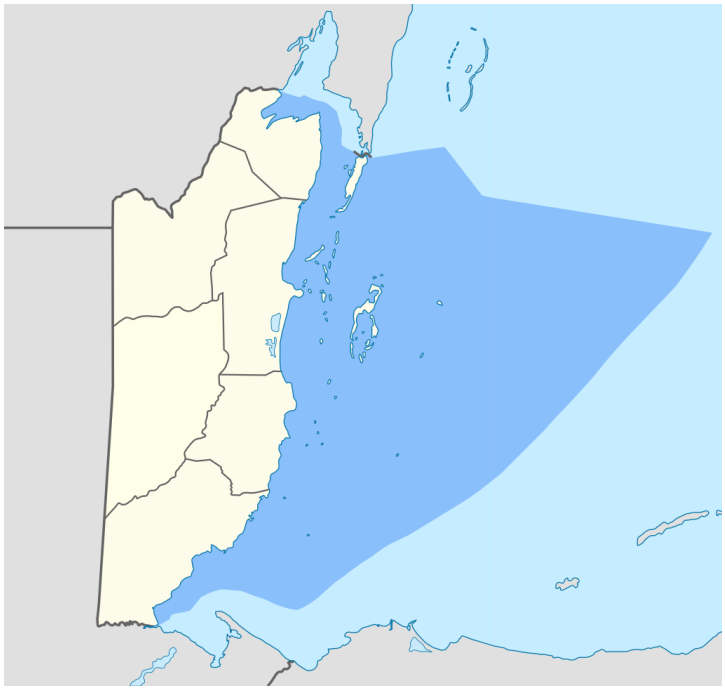
The Sapodilla Cayes have historically been a cause of conflict, with both Guatemala and Honduras staking partial or complete claims to the string of islands:

- Guatemala has a long-standing territorial, insular and maritime claim on Belize - refusing to recognize all or parts of Belize since Belize gained its independence in 1981. As a result of this claim, on December 8, 2008, a Special Agreement between Guatemala and Belize to submit Guatemala's territorial, insular and maritime differendum to the International Court of Justice was signed at the headquarters of the Organization of American States. It included the commitment of both States of acceding to the jurisdiction of the ICJ in order to settle the territorial dispute. The agreement was a direct product of a protracted series of negotiations that began in 1994 and marked the first step towards putting an end to the dispute via judgment. On December 8 2021 the Guatemalan government submitted its memorial (legal arguments) on the territorial dispute with Belize to the International Court of Justice (ICJ). This memorial should include the facts supporting their claim, with historical and legal submissions. As per ICJ rules (Article 53(2)) Belize is not allowed to disclose Guatemala's pleadings and has until June 8 2022 to submit its Counter-Memorial.
- Honduras has also claimed that the cayes are part of the Roatan chain of islands, which it enshrined in its constitution as part of its national territory in 1982. However, the 1859 Convention on the Boundary of British Honduras implied that Guatemala considered the Sapodilla Cayes as Guatemalan territory, a concept that Honduras did not challenge at the time. Recently, Honduran claims have not figured as prominently as those from Guatemala.[34]

Due to the competing claims on the area, the Organization of American States (OAS) facilitated negotiations that led to the Ramphal/Reichler proposals in 2002, which proposed delimitation of Belize's southern maritime territory, with an agreement to a joint ecological park around the cayes should Guatemala consent to a maritime corridor in the Caribbean under the OAS-sponsored 2002 Belize-Guatemala Differendum. Belize currently claims twelve nautical miles of Economic Exclusion Zone in the south as per the Maritime Areas (Amendment) Act of 2019.

[34] Source: SCMR Management Plan 2011-2016

Figure 13: Exclusive Economic Zone of Belize



Physical demarcation of the maritime boundaries between the countries is nonexistent, sometimes making it difficult to differentiate between legal and illegal activity. In addition, Belizean vessels are vulnerable to search and seizure by the Guatemalan Coast Guard due to the ambiguity of national boundaries. There is anecdotal evidence that Honduran and Guatemalan fishermen routinely enter Belizean territory (often illegally) for leisure and commercial purposes. Belize currently claims sovereignty over the SCMR as demarcated by SI 108.[35]

Sapodilla Cayes - The SCMR is one of 13 marine protected areas within the National Protected Areas System (NPAS) and one of eight marine reserves designated under the Fisheries Act. The Fisheries Act also designates spawning aggregation sites within Belize which are important for maintaining the viability of commercial species. Three of the protected spawning aggregation sites lie wholly within the boundaries of the Sapodilla Cayes Marine Reserve, and are managed as part of the protected area. Conservation and protection goals are supported by the National Protected Areas Policy and System Plan which places an emphasis on the importance of grassroots participation in decision-making and the equitable distribution of benefits derived from Belize's natural resources.

The Sapodilla Cayes Marine Reserve was established as a national protected area in 1996 via Statutory Instrument 117 of 1996 under the Fisheries Act (1948) and revised to include managed access area zoning in 2009 (SI 50 of 2009). Since its establishment, fisheries regulations have allowed for zoned multiple use, with some areas open for extractive use and others designated as no-take areas.

[35] See Figure 3 in Section 1.

With the expansion of the reserve, the zoning system is governed by SI 108 of 2020 which details permissible uses and restrictions within the reserve's seven (7) designated zones:

- Conservation Zone I (651 acres)
- Conservation Zone II (4,913 acres)
- Conservation Zone IIIA (51,255 acres)
- Conservation Zone IIIB (2,822 acres)
- Conservation Zone IV (228,958 acres)
- Preservation Zones (548 acres)
- General Use Zone (32,482 acres)
- Spawning Aggregation Site

Zone-specific regulations are defined in SI 108 and outlined in Table 8 below.

Table 8: Zone-specific Permitted Uses

Zone	Permitted Uses
General Use Zone	Commercial fishing; non-commercial fishing; and, recreational activities
Conservation Zone I	Recreational activities; and sports fishing
Conservation Zone II	Non-commercial fishing; and recreational activities
Conservation Zone IIIA	Commercial fishing
Conservation Zone IIIB	Commercial fishing
Conservation Zone IV	Recreational activities; sports fishing; recreational fishing; and fishing for the purposes of a tournament or competition.
Preservation Zone	None

In addition to zone-specific regulation, there are several general prohibitions that apply to all areas within the reserve (See Box 1).

Box 1

A person shall not, within the boundaries of the Reserve–

a. remove from its place or disturb any species of flora or fauna, including rocks, dead corals, shells or sand, unless authorised by the Fisheries Administrator;
b. have in his possession any flora or fauna unless authorized by the Fisheries Administrator or by an enactment;
c. discharge or deposit any material, including waste, toxic material, garbage or litter, into waters or land areas of the Reserve;
d. erect any structure, whether temporary or permanent unless authorised by the Fisheries Administrator;
e. mark or tamper with any sign, buoy or notice installed within the Reserve;

f. use long lines, fish traps, seine nets or gill nets unless authorized by the Fisheries Administrator to do so for scientific research purposes;
g. feed fish or other fauna of the Reserve;
h. engage in commercial fishing or non-commercial fishing within the Reserve without a valid license issued in accordance with these Regulations;
i. engage in spearfishing;
j. cast or drag any anchor in any manner which may damage coral or any other sensitive habitat;
k. engage in water-skiing or jet-skiing, except in areas that may be designated by the Fisheries Administrator on the recommendation of the Advisory Committee; or
l. engage in any activity with potential negative environmental impacts on species, habitats or ecosystems without written approval from the Fisheries Administrator on the recommendation of the Advisory Committee.

SI 108 of 2020 also defines offences within the reserve and related penalties as defined in Section 15 of the Fisheries Resources Act. Schedule 1 of SI 108 of 2020 also provides an entrance fee schedule that applies to all visitors to the reserve who are over the age of 12 (See Table 9).

Table 9: Entrance Fee Schedule for SCMR

Nationality	Period	Fee (BZD)
Non-Belizean	Per day	$20.00
	Per week	$50.00
	Per year	$100.00
Belizean	Per day	$5.00
	Per week	$10.00
	Per year	$15.00

In addition to general entrance fees, Schedule 2 of SI 108 defines licensing fees for legal activities within the reserve (See Table 10).

Table 10: License Fees within SCMR

License Type	Period	Belizean Fee (BZD per person)	Non-Belizean Fee (BZD per person)
Recreational Fishing	Per day	$5.00	$30.00
	Per week	$10.00	$70.00

	Per year	$25.00	$150.00
Recreational Fishing and fishing for the purposes of a tournament or competition (in Conversation Zone IV):	Per day	$50.00	$100.00
	Per week	$200.00	$400.00
Sport Fishing	Per day	$20.00	$20.00
	Per week	$50.00	$50.00
	Per year	$100.00	$100.00
Commercial Fishing		$25.00	N/A
Scientific Research		$500.00	$500.00
Boat Operator		$100.00	$100.00

The SCMR is of critical importance to the replenishment of commercially important fish species. Three of Belize's designated Spawning Aggregation Sites lie entirely within the boundaries of the Sapodilla Cayes Marine Reserve, and are managed as part of the protected area (see Table 11).

Table 11: Spawning Aggregation Sites of Belize

Site	Management Area	Management	Area
Rocky Point	Bacalar Chico Marine Reserve	Fisheries Department/ Green Reef	1,402
Dog Flea Caye	N/A	N/A	1,424
Caye Bokel	N/A	N/A	1,402
Sandbore	N/A	N/A	1,288
South Point Lighthouse	N/A	N/A	1,378
Emily/ Caye Glory	N/A	N/A	1,351
Northern Glover's	Glover's Reef	Fisheries Department/ SEA	1,779
Gladden Spit	Gladden Spit and Silk Cayes Marine Reserve	Fisheries Department/ SEA	1,280
Rise and Fall Bank	SCMR	Fisheries Department	4,250
Nicholas Caye	SCMR	Fisheries Department	1,664
Seal Caye	SCMR	Fisheries Department	1,600

Cayman Crown[36]	SCMR	Fisheries Department	TBD

In addition to the SPAGs presented in Table 11, explorations of the Cayman Crown site indicate that it may support one or several SPAGs. Expeditions conducted by TIDE, in collaboration with FUNDAECO and HRI, point to the potential existence of spawning aggregations for snapper and grouper. More exploration needs to be done to fully characterize the site, but initial explorations are promising.

Management

No caye is included within the management of the Marine Reserve. However, in 2009, worrying trends in the sale and lease of public lands for the purposes of development within the BBRS led to the BBRS being inscribed on the List of World Heritage in Danger. In successive reviews of the decision, UNESCO repeatedly appealed to the GOB to commit to an accurate and comprehensive land tenure inventory project and to draft legislation guaranteeing the permanent cessation of the sale and lease of lands throughout the BBRS and a clear definition and strict control of development rights on existing private and leased lands was of high importance.

Since 2009, several steps have been taken to support the removal of the BBRS from the List of World Heritage in Danger. Key developments include the Petroleum Operations (Maritime Zone Moratorium) Act which established a moratorium on oil exploration and other petroleum operations in the entire maritime zone of Belize; the adoption of revised Forests (Protection of Mangroves) Regulations which include stricter control mechanisms for protection of "priority mangrove areas" and specifically establish that impacts on and proximity to the property should be considered in the requirements for granting permits for mangrove alteration; the consideration of potential impacts on the Outstanding Universal Value (OUV) of the BBRS within the Environmental Impact Assessment (EIA) framework; and gradual operationalization of the Integrated Coastal Zone Management Plan (ICZMP).[37]

Currently, the ownership and leasehold status of the cayes within the reserve are as presented in Table 12.

Table 12: Ownership and Leasehold Status[38]

Caye	Fee Simple Status	Leasehold Status
Tom Owens Caye	Alejandro Vernon (100%)	ReefCI (100%)

[36] Potential SPAG. Exploratory work done at Cayman Crown to date indicates that the reef may be supporting several SPAGs

[37] Note: As of writing, the UNESCO World Heritage Committee has requested that the GOB submit to detailed information on the current status of the project "Cargo extension and construction of the cruise terminal and cruise tourism village" and its possible impacts on the OUV of the BBRS and to ensure that no activity, including dumping of dredged materials at sea, is allowed to proceed if it can result in negative impacts on the property.

[38] Source: Sea Turtle Nesting Site Monitoring Plan [Draft] 2020. Belize Fisheries Department.

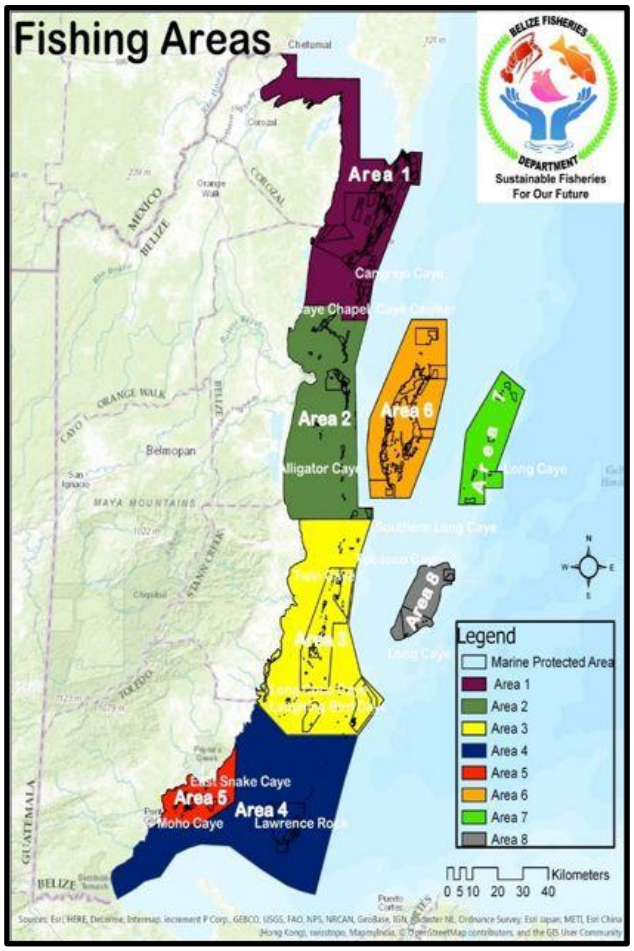
Northeast Caye	Lindsay Garbutt (100%)	Kenworth Tillet (100%)
Franks Caye	Carrie Fairweather (100%)	n.d.
Nicholas Caye	Machaca Group (100%)	n.d.
Hunting Caye	GOB (100%)	UB-ERI (100%)
Lime Caye	Government of Belize (100%)	Dennis Garbutt (100%)
Ragged Caye	Government of Belize (100%)	n.d.
Seal Caye	Bradley Rhinehardt/ Black Point Enterprise (100%)	Eloy Cuevas (100%)

The SCMR is currently managed by the Fisheries Department as the sole site manager. Within the reserve, the Fisheries Department is responsible for the enforcement of fisheries regulations including, but not limited to:

- Illegal fishing (i.e., fishing without the necessary licenses)
- Illegal extraction (i.e., extraction of protected species of flora and fauna)
- Illegal harvesting (i.e., unauthorized aquaculture)

The Fisheries Department is also responsible for conservation and wildlife management within the reserve and coordinates and collaborates with external stakeholders, agencies and other organizations for management purposes. The previous management plan for the reserve (pre-expansion) was developed in 2011 for implementation under a co-management agreement between the Fisheries Department and the Southern Environmental Association (SEA) but expired in 2016. That co-management agreement was not renewed due to the lack of secured funding for management activities within the reserve. The Fisheries Department manages a network of eight (8) managed access fishing zones across the country - the Sapodilla Cayes Marine Reserve falls within Fishing Area Zone 4.

Figure 14: Managed Access Fishing Zones



2.3.4 Global Importance

The SCMR is one of the least studied marine protected areas within the BBRRS-WHS due to its remote location. Initial research within the area was carried out in the early 2010s by the Toledo Association for Sustainable Tourism and Empowerment (TASTE), through partnership with the Earthwatch Institute and under the Conservation International Marine Management Area Science Programme. These early efforts provided valuable information on a number of topics, including coral reef ecology, fisheries management and resilience to impacts such as climate change. The data obtained through these early studies was included in the SCMR Management Plan 2011-2016. Within the reserve, the central basin and scattered coral patches provide nursery and feeding habitats for at least 25 species of international importance and recognized under the IUCN Red List as Critically Endangered, Endangered or Vulnerable (IUCN, 2008), including five species of coral, three species of turtle, fifteen species of fish and the vulnerable West Indian manatee. A number of the cayes have historically provided nesting sites for hawksbill, green and loggerhead turtles.

Table 13: Red List Species within SCMR

Species	Status

Staghorn Coral	Acropora cervicornis	Critically Endangered
Elkhorn Coral	Acropora palmata	Critically Endangered
Goliath Grouper	Epinephelus itajara	Critically Endangered
Hawksbill Turtle	Eretmochelys imbricata	Critically Endangered
Lamarck's Sheet Coral	Agaricia lamarcki	Endangered
Loggerhead Turtle	Caretta caretta	Endangered
Green Turtle	Chelonia midas	Endangered
Pillar Coral	Dendrogyra cylindrus	Endangered
Elliptical Star Coral	Dichocoenia stokesii	Endangered
Nassau Grouper	Epinephelus striatus	Endangered
Fire Coral	Millepora striata	Endangered
Star Coral	Montastraea annularis	Endangered
Star Coral	Montastraea faveolata	Endangered
Montastraea coral	Montastraea franksi	Endangered
Rough Cactus Coral	Mycetophyllia ferox	Endangered
Great Hammerhead	Sphyrna mokarran	Endangered
Scalloped Hammerhead	Sphyrna lewini	Endangered
Queen Triggerfish	Balistes vetula	Vulnerable
West Indian Manatee	Trichechus manatus	Vulnerable
Marbled Grouper	Dermatolepis inermis	Vulnerable
White Grouper	Epinephelus flavolimbatus	Vulnerable
Snowy Grouper	Epinephelus niveatus	Vulnerable
Hogfish	Lachnolaimus maximus	Vulnerable
Mutton Snapper	Lutjanus analis	Vulnerable
Cubera Snapper	Lutjanus cyanopterus	Vulnerable
Yellowmouth Grouper	Myctoperca interstitialis	Vulnerable
Whale Shark	Rhincodon typus	Vulnerable
Whitelined Toadfish	Sanopus greenfieldorum	Vulnerable
Rainbow Parrotfish	Scarus guacamaia	Vulnerable

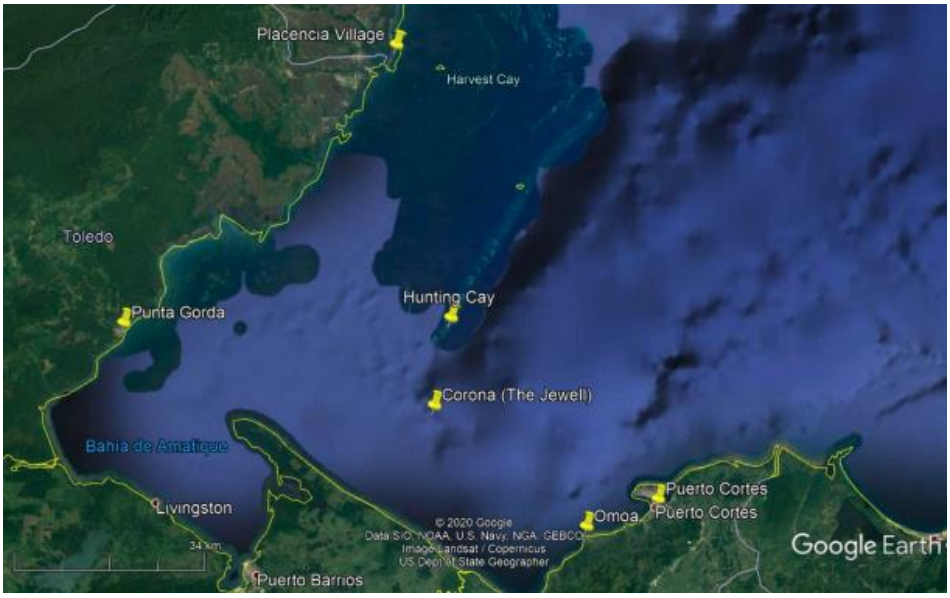
Cayman Crown - Studies designed to characterize previously undescribed reef systems and spawning aggregations within the Cayman Crown area, south of the SCMR, began in 2014. As of 2018 scuba diving expeditions with underwater video and nekton sampling have provided

evidence of spawning aggregations of horse eye jack, crevalle jack, Atlantic spadefish, mutton snapper, Cubera snapper and ocean triggerfish. In addition, many charismatic megafauna including pilot whales, sperm whales, and pelagic fishes including marlin, sailfish, wahoo, mahi mahi, kingfish and various species of tuna were observed within the area. More importantly, data collected on coral transects using AGGRA methods illustrated 60% live coral cover making the reef system one of the healthiest in the Caribbean.[39]

The site known as “Corona Reef”, “Crown Site” or “Cayman Crown” is located roughly 60 km southeast of Placencia Village. From Punta Gorda, it lies approximately 56 km eastwards. From Hunting Cay Corona Reef lies some 16 km south-southwest. A significant portion of the reef is located in Belize’s most southern marine territory. As of May 2020, a portion of the Cayman Crown has been designated as a no-take zone by the Guatemalan government.

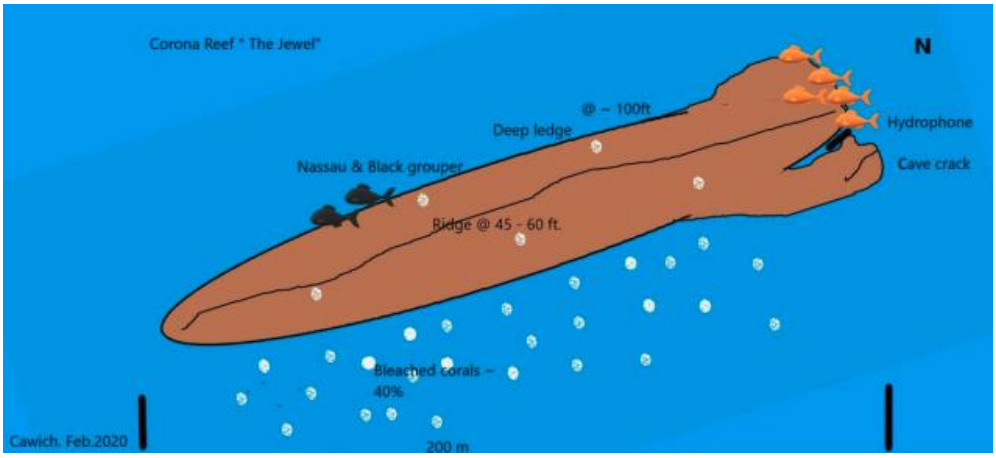
[39] Source: Environmental Defense Fund (2020). Belize adds another jewel in its crown as leader in ocean conservation. Accessed at: https://www.edf.org

Figure 15: General Location of Corona Reef



The "Jewel" can be best described as a large underwater spur going from a northeast to southwest direction. It lies partly within the SCMR and partly within a 2020 Guatemalan declared PA. It enjoys protected status in both countries - through SI 108 in Belize and through Ministerial Agreement No. 85-2020 in Guatemala. The NE point is characterized by high relief coral formations with some grooving. The NE point descends to 42.7m (140 feet). Present at this point is what appears to be a cave/ crack formation at about 130 ft. that rides up the spur for about 35 ft. in length. The northern side of the spur ascends from the depths and is best described as a deep ledge at about 30.5m (100 feet) that runs the entire length of the northern side. The southern side of the spur descends to about 30.5m (100 ft) after which it levels off into a flat area. This flat area was observed to have coral colonies of Oann, Pstr, Ofav, and Dlab. The spur ascends from all sides towards the center SW portion, where it reaches its shallowest depth, approximately 13.7m (45 ft) from the surface. The spur is approximately 200m in length and 30m wide.

Figure 16: Illustration of "The Jewel"[40]



In 2020 a survey was administered to surrounding communities in Belize, Guatemala, and Honduras to characterize the use of the reef's resources. This study was a joint effort between the Mesoamerican Reef Fund (MAR Fund), Healthy Reefs for Healthy People (HRI), Fundación Mundo Azul (FUNMZ), Toledo Institute for Development & Environment (TIDE) and Southern Environmental Association (SEA). A total of 56 artisanal fishermen and sport fishing guides in seven locations within the Gulf of Honduras were surveyed. In Belize, TIDE, SEA, and the Environmental Defense Fund (EDF) supported the effort. Twenty-two surveys were conducted in three locations in Belize: Punta Gorda, Monkey River, and Sapodilla Cayes. In Guatemala, the FUNMZ team and the new Fishermen Committee of El Quetzalito were the collaborators. Seven of the main boat captains of the community were surveyed. In Honduras, support came from Omoa Conservation Corps (CCO), and surveys were conducted in three locations of the Omoa Bay, mainly in the communities of Paraiso, Omoa, and Puerto Cortez. Twenty-seven fishermen of the organized fishing committees of each community and other fishermen that use the area were surveyed. The survey revealed that the Cayman Reef is extensively used for fishing by fishermen from all three countries with varying fishing modalities. Joint field expeditions conducted by TIDE, the Fisheries Department, and FUNDAECO between March 2021 and June 2021 have also provided data on indicator species as well as general reef health. Notable research activities to date are outlined in Table 14.

[40] Source: Cawich (2020)

Table 14: Research Activities and Outputs

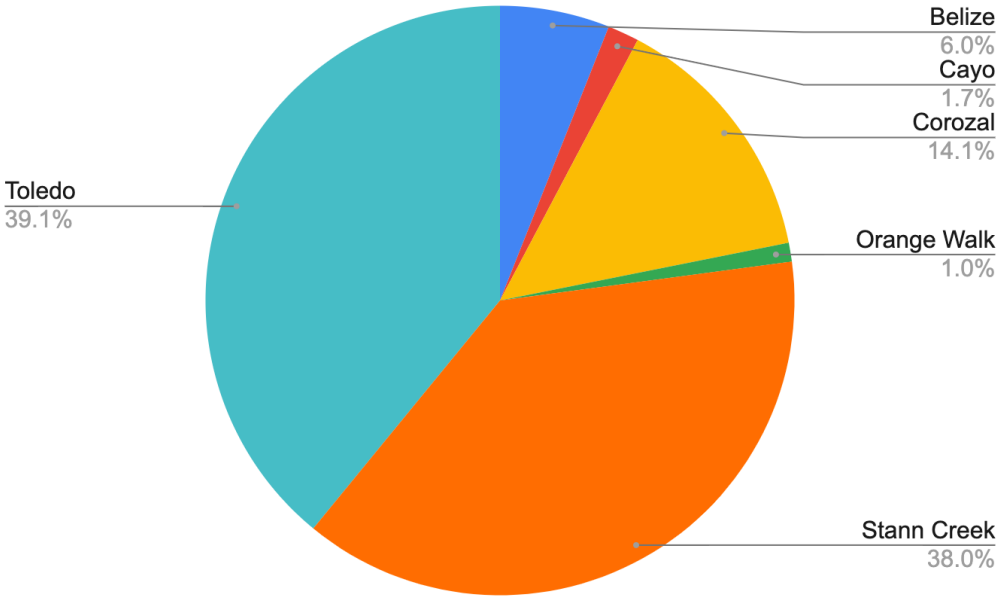
Year	Research Party/ Researcher	Output
2018	LGL Ecological Research Associations Inc/ Dr. William Heyman	● Characterization of previously undescribed reef systems and associated spawning aggregations in the area called the Cayman Crown (or Corona) south of the SCMR. ● Evidence of spawning aggregations of horse eye jack, crevalle jack, Atlantic spadefish, mutton snapper, Cubera snapper and ocean triggerfish. ● Observation of many charismatic megafauna including pilot whales, sperm whales, and pelagic fishes including marlin, sailfish, wahoo, mahi mahi, kingfish and various species of tuna. ● Recorded 60% live coral cover - some of the healthiest reefs in the Caribbean. ● Deep water reefs show previously undescribed geomorphology with spurs that drop from nearly vertically from their top at 20 m depth, for over 150m over the steep wall edge, into the Cayman Trench. ● Pressure on Cayman Crown resources is increasing - research party observed over 10 boats (from Guatemala) using lobster nets. ● Fishers from Omoa, Honduras are the most common users of the area, largely fishing with drop lines from anchored vessels at night. ● Honduran fishermen also fish during the grouper spawning time and most other times of the year.
2020	TIDE	● No spawning aggregation of any reef fish species was observed. However, schooling of snappers and grunt species were observed at one specific area. One Nassau grouper and one black grouper were also observed. ● Underwater mapping of the "Jewel"
2020	TIDE	● Fishing evidence confirmed in the Corona Reef area and further north, closer to the Sapodilla Cayes Marine Reserve. ● Observation of anchored vessels fishing and sport fishing/ recreational activities. ● Observation of spawning aggregations of Jacks - more than 2,000 Bar Jacks observed along with 800 Horse-Eye Jacks ● Observation of spawning aggregations of Schoolmaster Snappers with a maximum count of 400 individuals.
2020	TIDE	● Observations of Canthidermis sufflamen (Ocean triggerfish) showing signs of reproduction for the first 2 days of the expedition.
2021	TIDE	● Dispersed populations of commercially important species such as spring lobster and snapper ● Species such as Dog Snapper, Yellowtail Snapper, and Schoolmaster were seen at the SE end of the ridge, but not in abundance. ● Evidence of fishing - recuperation of fragments of gill nets and longlines

2.3.5 National Importance

The area is known for its high coral species diversity, and for the upwellings along the reef drop-off, which provide ideal conditions for spawning aggregations. This area is characterized by its variety of reef structures, important cross-shelf habitat linkages and an assemblage of ecosystems considered possibly the most biodiverse in the region. The SCMR is of great importance for many species of conservation concern, including the critically endangered hawksbill turtle and goliath grouper, and the endangered green and loggerhead turtles.[41]

The Sapodilla Cayes Marine Reserve is also of economic importance to Belize as a lobster, conch and finfish resource for traditional fishermen from mainland fishing communities - particularly Barranco, Monkey River, Punta Negra and Punta Gorda, as well spillover effects for communities in Guatemala and Honduras. Figure 17 below provides a breakdown of the distribution of fishermen who frequent the general area around the SCMR.

Figure 17: Breakdown of Fishermen within SCMR



Known locally as "Elbow", which is comprised of the three marine reserve spawning aggregation sites of Nicholas Caye, Rise and Fall Bank and Seal's Caye, is an aggregation site for mutton snapper, which is not included within the legislation, and is popularly fished during the aggregations season.

Despite no-take restrictions, the three spawning aggregation sites were found to have extraordinarily low numbers of fish as early as 2011 and anecdotal evidence suggests that extraction from the SPAGs continues. In addition to commercial finfish species, whale sharks (Rhincodon typus) and other marine mammals are known to travel through the marine protected area en route to feeding grounds to the north and south. The marine reserve has also been shown

[41] Source: IUCN (2008)

to have some of the highest densities of conch, with at least two known nursery sites and many documented adult aggregations.

The Sapodilla Cayes Marine Reserve is of particularly high touristic value – the aesthetic beauty within the reserve benefits a growing number of Belizean tourism operations, along with significant numbers of visitors from Guatemala and Honduras.

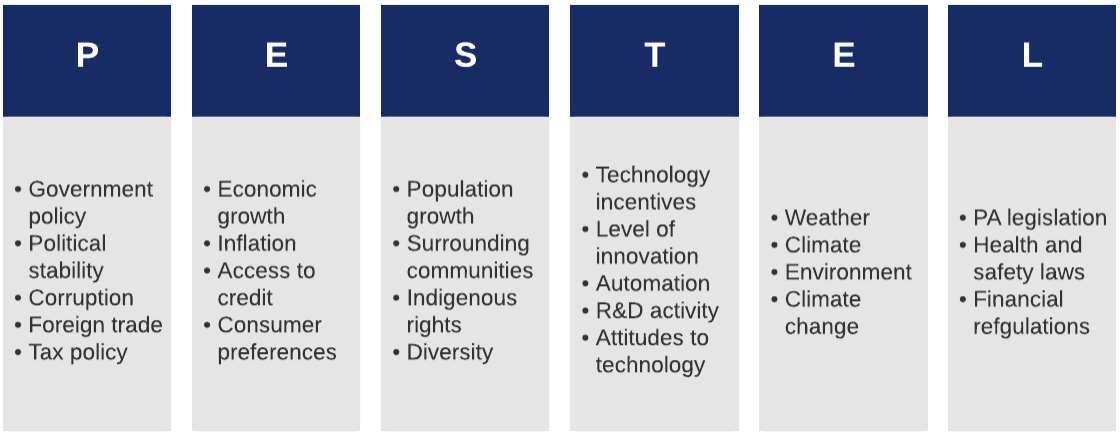
The area also has a high potential education and research value. In 2010, the development of the Living Reef Center, owned and operated by the University of Belize and constructed with support through the Earthwatch Institute and University of Belize, Toledo Center, was the first step towards establishing an education/ research focused presence within the reserve. It was hoped at the time that the facility would serve as a catalyst, attracting researchers and school educational groups to the area. However, the facilities fell into disrepair over the years and often lacked the necessary HR and resources to support research activities. Recognizing the importance of continued presence within the reserve, the potential co-manager and the BFD have renovated the fisheries building to accommodate extended stays for researchers. Renovations are set to be completed by the end of 2021.

Several coral sand cayes within the protected area have provided historical nesting sites for hawksbill, green and loggerhead turtles. Sandy cayes within the reserve also serve as nesting sites for a number of bird species. The cayes are also important for neotropical migratory species, which fill littoral forests each year as they travel to and from their wintering grounds.

2.3.6 Socio-economic context

In this section we detail the macro-environmental context within which PA managers operate and utilise a PESTEL factor framework and tool used to analyse and monitor the macro-environmental factors that impact PA management teams and current projects. PESTEL is an acronym that stands for Political, Economic, Social, Technological, Environmental and Legal factors. Figure 18 lists the PESTEL factors and some of the specific subcomponents that can affect PA managers and their operations.

Figure 18: PESTEL Analysis



Political

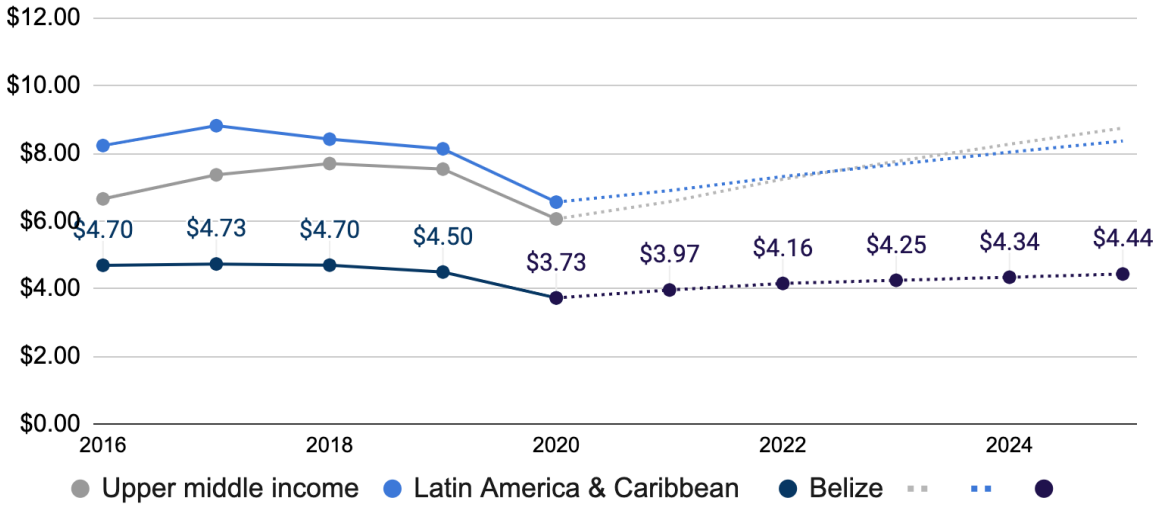
Belize is a subtropical country with both Latin American and Caribbean features. The nation gained independence from the United Kingdom in 1981 and has a total land area of 8,867 square miles[42]. Belize is bordered to the north by Mexico, to the west by Guatemala, and to the east by the Caribbean Sea. Belize operates with a Westminster-style parliamentary democracy and its constitution divides the government into three branches - the executive, the legislature, and the judiciary. Belize has two main political parties[43], and has a history of conducting free and fair elections with smooth transitions of power. The National Assembly is a bicameral legislature with an elected House of Representatives and an appointed Senate. Ministers of Government are appointed from among the members of the House and the Senate by the majority party. The Cabinet, headed by the Prime Minister, directs the policy of the Government and is collectively responsible to the National Assembly.

Economic

Belize has a small, essentially private-enterprise economy supported by a relatively small and culturally-diverse population with a 2020 per capita GDP of US$3,733, down from US$4,497 in 2019.[44] Current projections show that GDP per capita is expected to remain below 2019 levels up to 2025, as Belize navigates out of the economic recession caused by the Covid-19 pandemic.[45] Although Belize has one of the more stable political, social and business environments in Latin America and the Caribbean (LAC), it has historically lagged behind the LAC region and upper middle income countries in terms of per capita income (see Figure 19).

[42] 22,965.425 square kilometers
[43] People's United Party and United Democratic Party
[44] Current prices. Source: IMF (2021)
[45] Source: Ibid.

Figure 19: Comparative GDP per Capita (000's US$)[46]



Belize's economy is largely dependent on agriculture and tourism, with tourism being the number one foreign exchange earner followed by agricultural commodity exports. Limited income sources and a fairly undeveloped industrial base means that the country's economic performance is highly vulnerable to external shocks such as commodity price variation, adverse climate related occurrences (e.g. hurricanes and droughts) and changes in the economic performance of its major trading partners. The ongoing Covid-19 pandemic continues to dampen domestic consumption and squeeze government finances. GDP growth in 2020 contracted by more than 16% relative to 2019 and government debt rose to more than 134% of GDP in 2020 (see Table 15).[47]

Table 15: Belize Key Indicators[48]

Indicator	Year	Total
GDP/ Capita (current US$)[49]	2020	3,733.98
GDP Growth (%)	2020	-16
Inflation Rate (% change)	2020	0.8
Gross Government Debt (% of GDP)	2020	134.6
Primary Sector (% of GDP)	2019	10.3
Secondary Sector (% of GDP)	2019	21.6
Tertiary Sector (% of GDP)	2019	68

[46] Source: Ibid.
[47] Source: Ibid.
[48] Source: SIB (2021)
[49] Source: IMF (2021)

Belize 's development plan, the Growth and Sustainable Development Strategy 2016-2019 (GSDS), is built on four pillars/critical success factors (CSFs) namely: 1) optimal investment income; 2) social cohesion and resilience; 3) natural environmental, historical and cultural assets; and 4) governance and citizen security. Progress towards CSF1 is often hindered by socio-political factors such as corruption and a highly regulated domestic market.[50] Belize typically ranks poorly in accessibility to credit (173rd of 190) and starting a business (166th of 190), protecting minority investment (rank of 157th of 190) and contract enforcement (rank of 135th of 190).[51] These factors can make it difficult to attract FDI, especially for NGOs who manage PAs within the national network. In addition, high national debt levels constrain policymakers' ability to implement expansionary fiscal policy measures aimed at boosting economic activity. At the end of 2020, national debt totaled BZ$4.25 billion - with more than BZ$2.8 billion composed of public external debt.[52] Fiscal stability has been further eroded due to a fall in economic activity as a result of the government's Covid-19 containment measures. Consultations with industry groups reveal a pessimistic economic outlook for 2021 with a great degree of uncertainty as to fiscal policy. Tourism, a major income earner for the country, is not projected to return to pre-pandemic levels until 2023.[53] Government responses to the economic fallout from the pandemic have been funded mainly through domestic loans and debt levels are projected to increase significantly over the first half of 2021.[54] It is still unclear how the government will modify its fiscal policy to address the ongoing economic crisis but there is the possibility that the government will have to resort to austerity measures including public sector retrenchment, the cutting of low-priority government services, and raising taxes.

Social

As of 2020, the total population was estimated to be 419,199 of which 51% were female and 49% were male. In 2018, the urban population was estimated to be 46%. Most individuals are of mixed or multi-racial descent. Mestizos and Creole account for the largest groups with about 48% of the population being Mestizos and 26% being Creole. Maya accounted for 12.1% of the population, while 5.4% are made up of Garifuna and the remainder 8.1% of the population are of other ethnicities including Asians, East Indians and Caucasians. Table 16 presents key demographic indicators.

[50] Source: World Bank (2020)
[51] Source: Ibid.
[52] Source: CBB (2021)
[53] Source: Consultation with PACT
[54] Source: Moodys (2020)

Table 16: Belize Key Demographic Indicators[55]

Indicator	Year	Total
Population[56] (Total)	2020	419,199
Population (% female)	2020	51
Urban Population (% total)	2018	46
Urban Population (% total)	2030	49
Urban Population (% total)	2050	57
Avg. Annual Rate of Change (%)	2015-2020	2.3

Poverty is high in Belize, with the most recent poverty assessment in 2009 estimating the poverty rate at 41%. The main at risk group identified in Belize is children.[57] Of those estimated to be at the poverty line, 50% of Belizean children under the age of 15 are classified as poor and 58% of youths under 18 are classified as multidimensionally poor. Gender was found to have little influence over poverty. However, there was a great disparity amongst different ethnic groups. Different ethnic groups struggled with poverty more than others. The poverty rate for the indigenous Maya population was 68%, which is significantly higher than other ethnic groups. Following this group are the Garifunas and Mestizo, who account for 39% and 42% of the poor population, respectively.

Table 17: Poverty Breakdown by Ethnicity[58]

Ethnic Group	2009		% of Population	
	Indigent	All Poor	Indigent	All Poor
Creole	9	32	15	21
Mestizo	13	42	40	48
Maya	51	68	34	17
Garifuna	12	39	6	7
Other*	11	35	5	6
All Groups	**16**	**41**	**100**	**100**

Further, the September 2020 National Labor Force Survey[59] showed that approximately 29.7% of Belizeans within the labour force were unemployed. This may result in increasing pressure on natural resources such as timber and fish stock communities begin to exploit resources as a

[55] Mid-year estimate for 2020. Source: SIB (2021).
[56] Ibid.
[57] National Poverty Assessment 2010. Source: SIB (2010).
[58] Source: SIB (2020)
[59] Belizean Labour Force Survey 2020. Source: SIB (2020).

substitute source of income, especially among rural communities who depend on natural resources for food and livelihood. It can be noted that in April 2019[60], 7.37% of the rural population were unemployed and by September 2020,[61] 12.56% of the population was unemployed. Almost doubling the unemployment rate among rural communities may increase pressures as communities begin to explore ways to supplement their income loss.

Technology

Technological factors include technological aspects like R&D activity, automation, technology incentives and the rate of technological change. These can determine barriers to entry, minimum efficient production level and influence outsourcing decisions. Furthermore, technological shifts would affect costs, quality, and lead to innovation. With a relatively small population and limited industrial production, Belize has traditionally been a net importer of goods and technology. Imports in 2018 totaled $238.132 million[62], composed mainly of food, consumer goods, fuels, lubricants, machinery and equipment.

As of 2019 Belize is ranked third in the Caribbean in broadband speed.[63] In the past five years, domestic telecommunication companies have made significant efforts to establish 4G cellular networks, expand mobile coverage, streamline online payment services and expand fiber-optic connectivity across the country. As of 2020, approximately 60% of Belizeans have mobile phones with access to 3G or 4G.[64] However, despite the improvements in ICT infrastructure, R&D activity continues to be low given the very small manufacturing and industrial sector. Automation is typically limited to agricultural processes such as dairy processing and poultry production, and beverage production. Almost all manufacturing or production equipment is imported to meet domestic demand. A 2018 Technology Needs Assessment[65] (TNA) conducted by the Government of Belize found that there is considerable room for improvement in the adoption of technology that can assist in climate change mitigation efforts, public transportation, and renewable energy generation.

Belize ranks 17th in Latin America and the Caribbean and 97th in the world in mobile internet connectivity, behind fellow CARICOM countries such as Barbados, the Bahamas, and Trinidad and Tobago.[66] The adoption of technology by PA managers allows them to better monitor their environment, collect data, track progress toward targets, and manage logistics. Due to the size of protected areas and limited ranger personnel, the ability to remotely monitor and locate threats of deforestation, illegal logging and hunting could significantly improve deployment efficiency and reduce operational costs. Managers can also use technology to increase awareness, connect with

[60] Source: SIB (2020)
[61] Source: Ibid.
[62] Source: CBB (2018)
[63] Source: Digi (2019)
[64] Source: ITA (2020)
[65] Source: MAFFESDI (2018)
[66] Source: GSMA (2019)

consumers and generate revenue, both domestically and internationally. Social media presence can help connect PA managers with potential donors, impact investors and the domestic private sector. Through digital innovation and technology adoption, PA managers can have the ability to engage in digital conservation, a method that influences the way the public perceives, thinks and interacts with nature.[67]

Environmental - Belize is part of a biological bridge between North and South America inhabited by approximately 4,784 species of flora and fauna including 105 globally threatened species[68]. The 8,867 square miles of the landmass is composed of 14 broad ecosystem types where 61.6% remains natural and intact forest cover. Belize's primary conservation tool has been the establishment and management of protected areas. Belize developed the National Protected Areas System (NPAS), under the NPAS Act[69], as a tool to provide for the maintenance of the coordinated management of protected areas in Belize. Forty per cent (40%) of that forest cover is represented under the NPAS which comprises 103 protected areas. Belize also utilizes other policy-driven measures to regulate forest and marine cover including the Forest Act[70], the Coastal Zone Management Act[71], Protected Areas Conservation Act[72], Environmental Tax Act[73], Land Tax Act[74].

In recognizing the importance of Belize's Natural Resources and responding to the funding challenges for biodiversity, the Biodiversity Finance Initiative (BIOFIN) was launched in Belize in September 2016 and implemented by the Government of Belize through the Ministry of Agriculture, Forest, Fisheries, Environment, and Sustainable Development (now the Ministry of Sustainable Development, Climate Change Adaptation and Disaster Risk Management), with the goal of identifying the critical institutional and finance gaps in Belize as well as develop and implement a targeted resource mobilization strategy for biodiversity finance. Through the national Biodiversity Finance Plan (BFP), optimal financing mechanisms were identified to mobilize the needed resources to meet Belize's National Biodiversity and Strategy Plan (NBSAP) targets. The seven prioritized NBSAP Targets are:

1. By 2020, Belize's NBSAP is being implemented effectively, monitored and evaluated, and is achieving the desired outcomes
2. By 2025, key ecosystem services are sustainably managed and resilient to threats.
3. By 2020, accurate and current data on Belize's natural resources and environmental services inform relevant national development decisions.

[67] Source: Digital Technology and the Conservation of Nature, 2015
[68] Source: Belize's 5th National Report to the CBD (2014)
[69] Source: National Protected Areas System Act, 2015
[70] Source: Forest Act Chapter 213 Revised Edition 2000
[71] Source: Coastal Zone Management Act Chapter 329 Revised Edition 2000
[72] Source: Protected Areas Conservation Trust Act Chapter 218 Revised Edition 2000
[73] Source: Environmental Tax Act Chapter 64:01 Revised Edition 2003
[74] Source: Land Tax Act Chapter 58 Revised Edition 2000

4. By 2020, Belize is restoring 30% of degraded ecosystems to maintain and improve the status of ecosystems and ecosystem services.
5. By 2025, there is a 20% reduction in terrestrial impacts and illegal fishing from transboundary incursions.
6. Between 2018 and 2030, no species will become functionally extinct in Belize.
7. By 2020 Belize has promoted and implemented a national harmonized system of environmental standards that foster environmental responsibility and sustainability.

The cost of implementing Belize's NBSAP was estimated at BZ$70.3MN, while the cost of the seven prioritized NBSAP targets was BZ$49.8MN (over a ten-year period)[75]. It was also estimated that completion of the NBSAP would result in 51% compliance with Global Aichi Targets and by extension compliance with Global Aichi targets would cost BZ$138.5MN. In order to meet national targets, the BFP recommended the following:

- Improved tracking of public sector expenditure;
- Alignment of donor funds/project financing with national development plans particularly the NBSAP;
- Increased focus on the results of programs; and
- A revision of existing programs for effectiveness in achieving national development targets.

Legal

Belize's legal system is based on English Common Law. The Supreme Court of Belize is established as the superior court of record and has unlimited original jurisdiction to hear and determine any civil or criminal proceedings. The Court also hears and determines any appeals arising from any decision of an inferior court. The Caribbean Court of Justice (CCJ) is Belize's final court of appeal and hears appeals in both Civil and Criminal matters. Security forces consist of the Belize Police Department, Belize Coast Guard and the Belize Defense Force (army). Judicial independence in Belize is relatively high and stable but the partiality of courts is often an area for concern[76]. Lack of confidence in the courts often deters public and private investment and enables corruption, adversely impacting entrepreneurship and economic development. The mismanagement of public funds and government corruption continues to be a divisive and impactful issue in Belize.[77]

2.4 Physical Environment

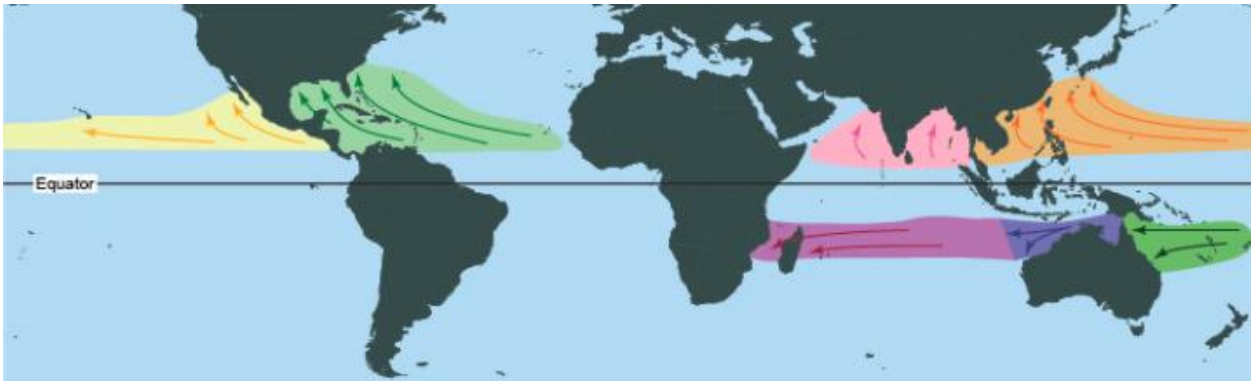
2.4.1 Climate

Temperature and Rainfall - Belize is characterized by a moist tropical climate with a seasonal variation similar to other Caribbean countries. Climate in Belize is defined by two (2) seasons - a wet and dry season. The wet season occurs during the months of May to October and the dry season occurs during the months of November to April. The mean annual temperature ranges from 23-27°C, providing some variation throughout the country, with the coast generally exhibiting

[75] Source: BIOFIN (2018)
[76] Source: CATO (2020)
[77] Source: Looney (2020)

hotter temperatures than the interior. The El Niño Southern Oscillation (ENSO) heavily influences Belize's climate, in addition to the intensification of the Inter-Tropical Convergence Zone (ITCZ). The El Niño phenomenon generally produces warmer conditions during the months of June to August, whereas La Niña produces wetter conditions typically associated with the tropical Atlantic cyclones. During the wet season, Belize usually receives mean monthly rainfall of 150-400 mm in the south of the country.[78] Belize is prone to hurricane impacts since it lies within the North Atlantic-Gulf of Mexico-Caribbean Sea Tropical Cyclone Basin.

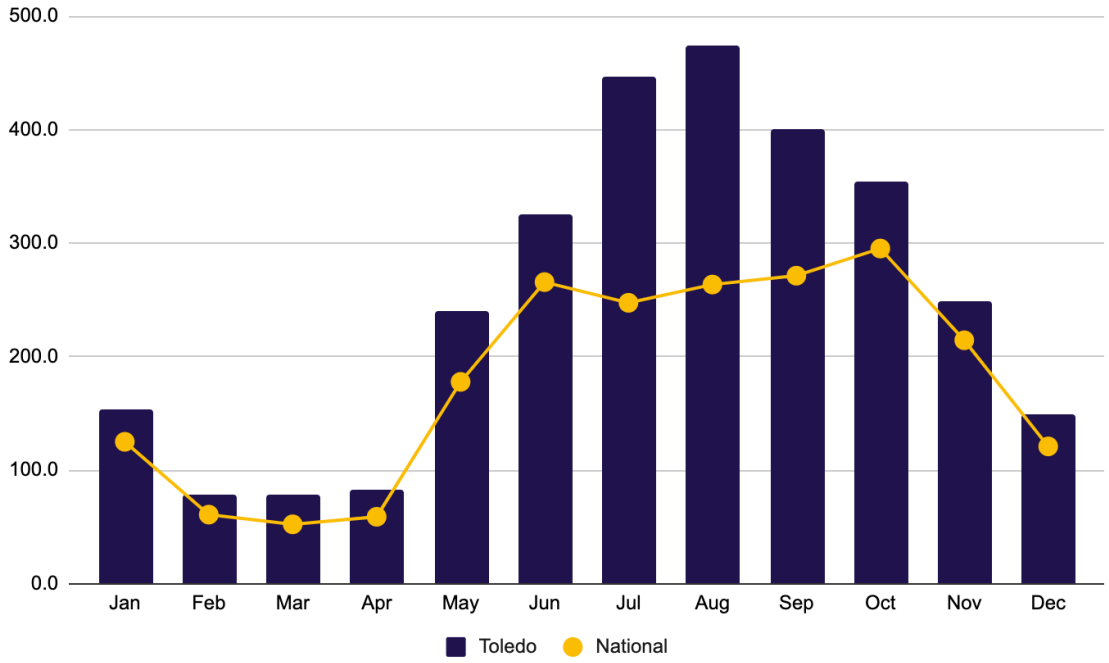
Figure 20: Tropical Cyclone Formation Basins



Site-specific meteorological and oceanographic information is not collected regularly within the SCMR. The closest weather station is located 35 miles west in Punta Gorda Town. On average, the Toledo district experiences rainfall in excess of national averages, particularly in the wet season (May to November). The dry season typically stretches from December to the end of April, with minimum monthly rainfall as low as 78.0 mm in February. In the wet season, maximum monthly rainfall of 474.5 mm in August, roughly 61% higher than the maximum national monthly rainfall.

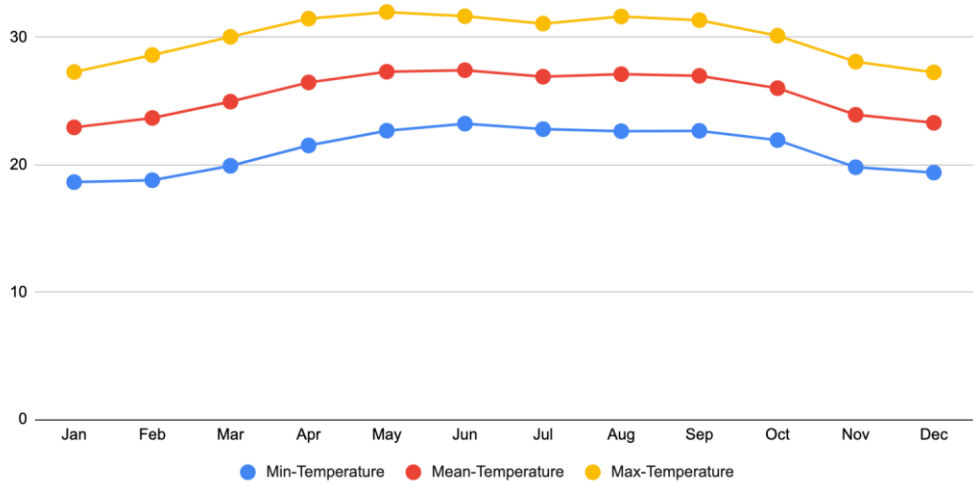
Figure 21: Monthly Rainfall (1991-2020)

[78] Source: World Bank (2021)



Annual air temperatures in Toledo average 25.6°C, fluctuating throughout the year from a minimum of 18.6°C in January and a maximum of 32°C in May.

Figure 22: Min-Mean-Max Temperature in Belize (1991-2020)

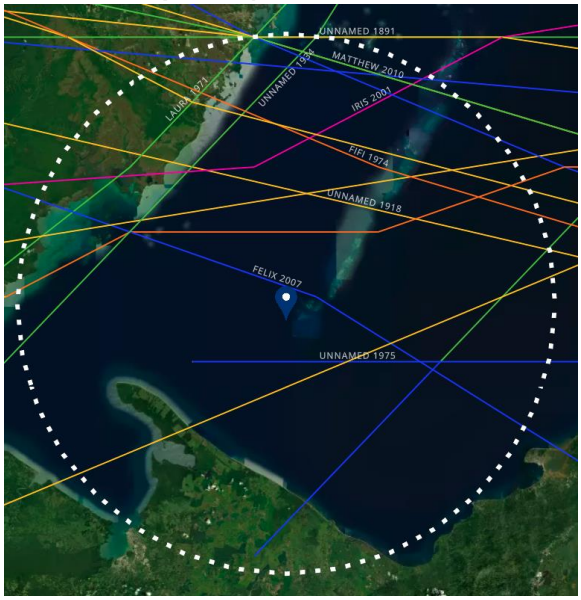


Natural Disasters

Tropical Cyclones - Tropical cyclones affect Belize every year, with the effects being felt particularly strongly on the outlying cayes and atolls. Originating in the Atlantic Ocean over warm, tropical waters, these storms are non-frontal, developing highly organized circulations, and ranging in scale from tropical depressions (sustained wind speeds <38 mph) to tropical storms (sustained wind speed < 74 mph) and hurricanes (with sustained wind speed > 74 mph). The hurricane season

lasts from June to November, with 18 tropical cyclones passing within 50 nautical miles of the SCMR between 1887 to 2021.

Figure 23: Historical Tropical Cyclone Paths within 50 NMI of SCMR



Tropical cyclones can have direct physical impacts on coral reefs such as those found within the SCMR. High winds can cause powerful waves which can topple entire coral heads, or shift sand which can scour or smother coral colonies. Delicate branching corals – like staghorn and elkhorn – are among the most vulnerable to breakage and may be reduced to rubble during a severe storm.

Climate Change - Belize is vulnerable to the effects of climate change including, but not limited to, sea level rise, coastal erosion, coral bleaching, and droughts, with impacts likely to intensify given expected increases in weather volatility and sea temperature.[79]

Table 18: Expected Climatic Developments and Indicators[80]

Indicators	Projections
Temperatures	● Belize is expected to be warmer by up to 20°C by the 2030s, and up to 40°C by the end of the century.[81] ● Sea surface temperatures in the Caribbean are projected to go up by as much as 2 degrees Celsius by the end of the century. ● Rising temperatures could exacerbate both the activity of and the damage caused by tropical cyclones. Average annual damages in the Caribbean could increase between 22 and 77 percent by 2100.[82] ● Disruptions to marine ecosystems (including coral bleaching, seaweed invasion,

[79] Source: IMF (2018) https://www.imf.org
[80] Source: IMF (2018)
[81] Source: World Bank Climate Change Knowledge Portal (http://sdwebx.worldbank.org/climateportal/)
[82] Source: Acevedo, S., "Gone with the Wind: Estimating Hurricane and Climate Change Costs in the Caribbean," IMF WP/16/199.

and fish populations) are likely to exact significant costs to the tourism and fisheries sectors.

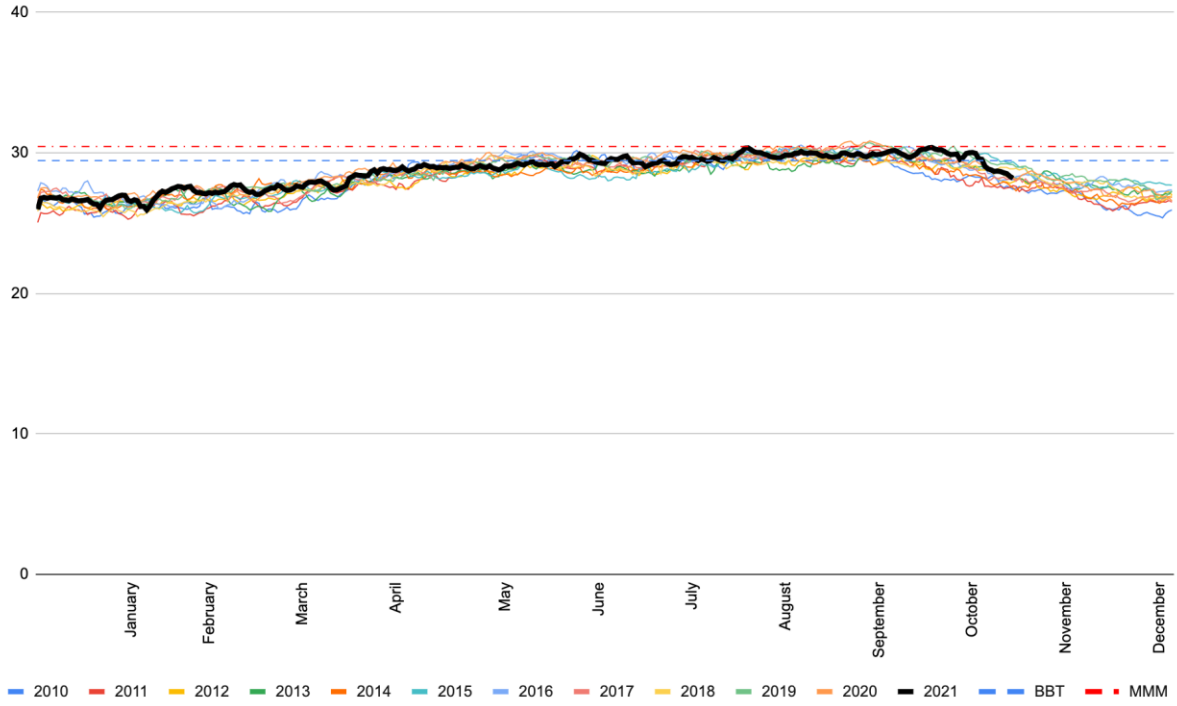
Precipitation	● General Circulation Models (GCMs)[83] predict a median decrease of up to 22 percent for annual rainfall between 2020 and 2039.[84] ● Changes in rainfall patterns are projected to increase the likelihood of water shortages and heighten the risk of drought.
Sea Level Rise	● Sea level rise is projected to exceed 10 cm by the 2030s in low, medium and high emission scenarios, with rises of 22, 23 and 38 cm respectively by 2050 and 34, 56 and 120 cm respectively by end-century.
Extreme Weather Events	● Projections show increased inter-annual variability, with more intense effects of each severe weather event (particularly strong winds from storms, tropical depressions and hurricanes).[85] ● Greater intensity could accelerate soil erosion, leading to the contamination of groundwater, the salinization of water sources, and the sedimentation of dams and reservoirs, adversely impacting the quality of the country's water resources.

Global warming is particularly important given the impact that warmer sea temperatures have on the eutrophication process, leading to decreased pH levels and greater acidification. Corals are susceptible to warmer temperatures and suffer from coral bleaching once sea temperatures are sufficiently warm significantly increasing the likelihood of coral death.

The figure below provides daily sea-surface temperatures for Belize since 2010. The coral bleaching threshold is typically 1°C greater than the max monthly mean temperature. Temperatures during the dry season regularly exceed the coral bleaching threshold which makes our coral reef vulnerable to coral diseases and ultimately death.

Figure 24: Historic SST in Belize

[83] General Circulation Models are climate models used to simulate the response of the global climate system to increasing greenhouse gas concentrations.
[84] Source: World Bank Climate Change Knowledge Portal.
[85] Source: Ibid.



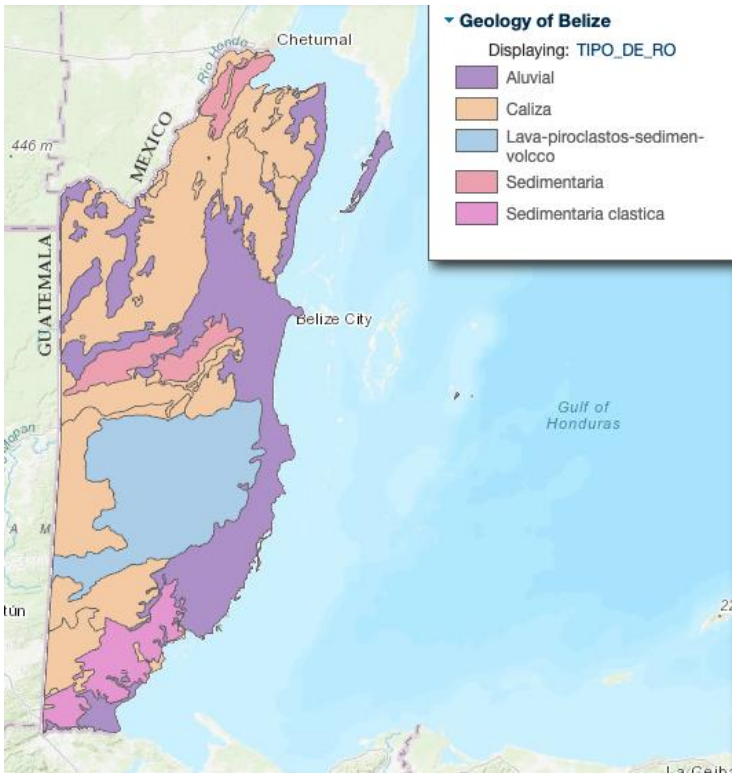
2.4.2 Geology

Belize is located on the eastern edge of the Yucatan Tectonic Block that belongs to the North American Plate. The area is characterized by the presence of left lateral faults with a predominantly North-South orientation. These are the types of faults that give rise to the approximate north-south boundary of the coast of the Yucatan peninsula. The coastal zone of Belize can be classified geologically as a carbonate platform, in which its continental zones appear, as well as its internal, middle and external platforms that extend out to sea.

The geology of Belize is characterized by four (4) distinct geological zones. There are deposits of volcanic rock in the south-central region formed in the Late Carboniferous-Permian geologic period, limestone rock deposits along much of the western half of the country, and alluvial sedimentary rock distributed along the coasts from north to south. Small pockets of sedimentary rock formations are scattered across the country.

Figure 25: Geology of Belize[86]

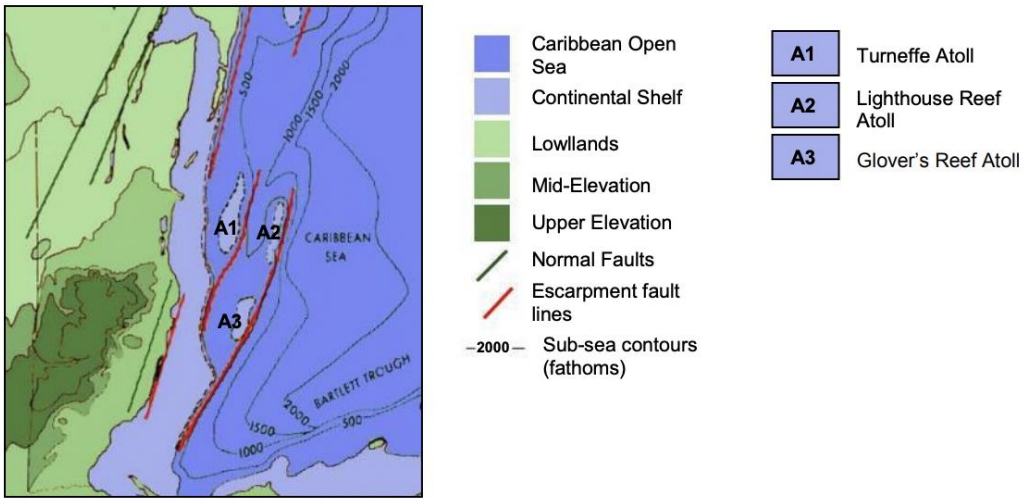
[86] Source: Data Basin (2020) https://databasin.org/datasets/1ae11142888f44b7a57e81e92fcde382/



The Sapodilla Cayes and most of the southern part of the Belize mainland are formed of Pleistocene limestone bedrock. The Belize continental shelf underlies the entire coastline of Belize and extends seaward 15-40 km from the coast. It is a complex underwater platform of Pleistocene limestone rock that ends abruptly on top of the first of three northeast-southwest escarpments that lie off the coastline. The first escarpment runs parallel to the coast, dropping off to the east to a depth of about 1 km. An extensive reef system has developed upon the rim of this escarpment, forming the Belize Barrier Reef, sheltering the lagoon to the west. Cayes dot this platform, some formed on mangrove peat, others from coral outcrops and sand deposition.[87]

[87] Source: Rath (1996)

Figure 26: Tectonic Features - Belize



2.4.3 Bathymetry

Belize has an extensive maritime area of 10,000km2. Unique to this area is a 250 km long barrier reef that extends from the tip of the Yucatan Peninsula southward into the Gulf of Honduras. Seaward of the reef crest are three coral atolls: Glover's Reef Atoll, Lighthouse Reef Atoll and Turneffe Island Atoll.

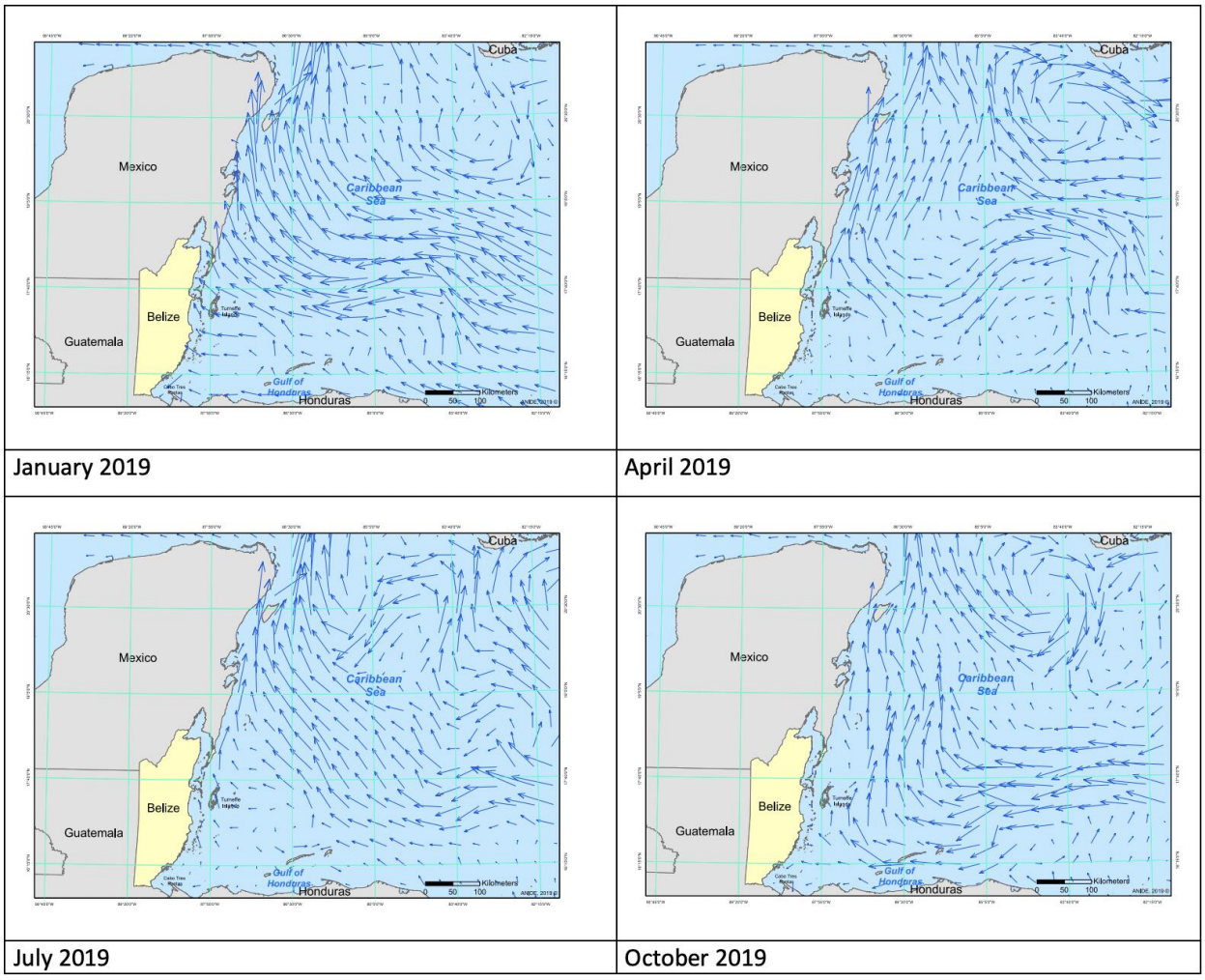
The barrier reef complex has been divided into three provinces based on their community distribution and geomorphic characteristics: Northern, Central, and Southern Provinces (Burke, 1982). The reserve area lies well within the Southern Province, which extends for about 59 km from Gladden Spit to the Sapodilla Cayes and is distinguished by shallow-water reefs, which occur as fringes around the cayes. The depth of the water over these reefs is less than 5 meters, forming exposed reefs during low tides. Depth contours for the inner coastal lagoon increase from 10 meters to 40 meters toward the center of the lagoon. Outside the main barrier, the reef slopes gradually from 10 meters to 50 meters (Figure 10; Maps 6 and 7). The southern 6 kilometers of the barrier reef consists of a series of large shoal patches intersected by deep channels (Stoddart et. al., 1982). Standing on these patches are seven carbonate islands known as the Sapodilla Cayes - Tom Owens, Northeast Sapodilla, Frank's, Nicholas, Hunting, Lime and Ragged Cayes. Instead of ending abruptly, the reef turns westward for 3.7 km and makes a sharp U-turn toward the north to form an additional 9 km of reefs and several small cayes and reef patches (Stoddart et. al., 1982). The Seal Cayes, the smallest cayes within the reserve, are located on the northern end of the J-shaped hook.

The basin enclosed within the Sapodilla reef reaches a maximum depth of 40-50m and exhibits unusual topography. The seabed consists of a complex mosaic of circular sediment pockets and Montastrea reef. Discrete sediment pockets have a diameter of approximately 10m, unquantified depth and are distributed regularly across the bottom. Neither the geology or sediment dynamics of this unusual area are completely understood.

2.4.4 Tides and water movement

The Caribbean Current rotates progressively, eventually normalizing to a northerly direction just north of Ambergris Caye. The current preserves this northerly direction along the eastern coast of Yucatan. In the southern zone (Bahía Amatique), the current decreases its speed drastically and its direction is erratic. In this zone, the accumulation of sediments is higher. Figure 27 shows several satellite determinations of the speed and direction of the Caribbean Current in four different months in 2019.

Figure 27: Major ocean currents in Yucatan Peninsula border. Bar size 100 cm/s (approx.)[88]



The water currents in Belize distribute sediments from river discharges and help transport larvae, nutrients and pollutants, as well as disease and invasions (e.g. connectivity through currents has facilitated invasive species movement in Belize such as the lionfish (Pterois volitans) as part of a larger, regional invasion).

Currents also transport large amounts of garbage and debris, carried in the water stream from the Belizean, Guatemalan and Honduran coastlines. Larger settlements such as Puerto Barrios in

[88] Source: University Of South Florida (2019). Processed By ANIDE (2019a).

Guatemala, Puerto Cortes in Honduras, and Punta Gorda in Belize, generate substantial solid waste which can often get trapped within the currents in the Bay of Honduras and adjacent to the SCMR. In addition, debris from the mainland is carried downstream, especially in times of heavy rainfall, and empties out along the coast. During the wet season, there are often large quantities of solid waste and debris that are washed ashore on the cayes within the SCMR typically believed to originate from the larger watersheds of Guatemala and Honduras.

Figure 28: Solid Waste Trapped in Seaweed[89]

2.4.5 Water Parameters

A Smithsonian Institute Field Station has been monitoring basic water parameters within the South Water Caye Marine Reserve since 1994 and has been considered sufficiently close (approximately 45 miles/ 72km to the north) to provide an indication of general conditions within and around the SCMR.

[89] Source: SCMR Management Plan 2011-2016

Water Temperature - Temperatures at Sapodilla Cayes Marine Reserve can reach 27°C on the leeward side of the cayes during calm, hot days, with the average water temperature being 25°C in areas where there is good water exchange, with mean monthly measurements during the period 1994 - 1996 ranging between 25.4°C – 30.3°C.[90] Increasing water temperature has been linked with coral bleaching - during September, 1995, for example, sea surface temperatures reached a 12-year high of 29.9°C to the east, at Glover's Reef. Surface water temperatures over the drop-off at Carrie Bow Cay were the highest recorded since CARICOMP monitoring began in January 1993, reaching a peak of 30.4°C during the first two weeks of June 1995 (Jones, 2003). Bottom water temperatures at CARICOMP Coral Reef Site I (13m water depth) averaged 29.8°C (±0.16) during the last week of August. This coincided with the first widespread coral bleaching event within Belize reef waters. By December 1995, temperatures had fallen to a monthly average of 27.7°C, due partly to the passages of Hurricanes Opal and Roxanne across the Yucatan Peninsula in late September and early October, respectively. This pattern has been replicated across the entire reef of Belize, including Sapodilla Cayes Marine Reserve.

Sedimentation/ Turbidity - The Belizean coast has two main sources of sediments on its coastline: those from river discharges from incident hydrological basins, and sediments from reefs. Terrigenous sediments come from the northern, central, southeastern, and southern hydrological regions of Belize (Table 19). Sediments are derived from continental rocks and transported by river currents to their discharge into the Caribbean Sea. Four sediment dispersion zones have been identified, each providing similar amounts of sediment; the largest is the northern region with 532 km2 of dispersion surface area. The zone with the greatest amplitude occurs in the southern zone of Bahía Amatique (Toledo) (Figure 29).

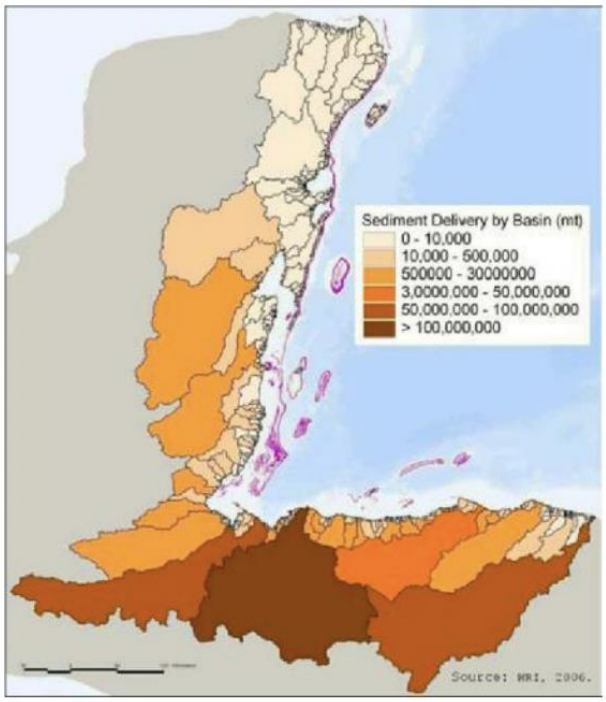
Table 19: Ocean Sediment Dispersion Areas in Belize

Dispersion Sediment Area	Hydrologic Region	Creeks and Rivers	Ocean Dispersion Area (km2)
1	North	Río Hondo, Blue Creek, Chan Chich River, Booth River, New River, FreshWater Creek, Northern River	532
2	Central	Belize River, Mopan River, Macal River	495
3	Southeast	Mullins River, Big Creek North, North Stann Creek, FreshWater Creek, Sittee River, Cabbage Haul Creek, South Stann Creek, Big Creek South, Mango Creek, Plantation Creek, Monkey River, Deep River	521
4	South	Golden Stream, Middle River, Rio Grande, Joe Taylor Creek, Moho River, Temash River, Sarstoon River, Deep River, Monkey River	466

[90] Source: Nightingale/ TASTE (2004)

Carbonate sediments come from the destruction of reefs and atolls by waves and from the organisms that develop on the bottom of the carbonate continental shelf. The highest concentration is in the pre-reef zone (facing seaward), where more than 90% of the sediment is detritic carbonate. The amount of detritus decreases towards the post-reef zone (60%) reaching 30% in the interior lagoons.[91]

Figure 29: Sediment Delivery by Watershed Basin[92]



Salinity - Salinity varies depending on the time of year, with lower salinity during the wet season. The salinity of normal seawater is 36 parts per thousand (ppt) and, except very close to the mainland, normal salinity persists throughout the Belize continental shelf, including the Sapodilla Cayes area (Rath, 1996). Salinity in the reef lagoon averages 37.2 ppm. However, during the rainy season it can drop to 33 ppm (Nightingale, SCMR Draft Management Plan). Due to the location of the Sapodilla Cayes Marine Reserve equidistant from Belize, Guatemala and Honduras it is not uncommon for large outflows of freshwater to reach the Sapodilla Cayes during the rainy season. These flows often create a colder flow of fresh water of up to a meter deep to reach the waters of the SCMR. These freshwater flows are often accompanied by large amounts of debris washing out of the neighbouring watersheds.

pH - The general pH is 7.2 in the vicinity of the reef and surrounding areas.[93] There is a growing global concern about ocean acidification, with the increasing absorption of carbon dioxide from the atmosphere which is predicted to result in the inhibition of growth of reef builders. Ocean

[91] Source: CZMAI (2019)
[92] Source: Burke et. al. (2006)
[93] Source: SCMR Management Plan 2011-2016

acidification is occurring at a rate 30 to100 times faster than at any time during the last several million years driven by the rapid growth rate of atmospheric CO2.[94] Economic and population scenarios predict that atmospheric CO2 levels could reach 500 ppm by 2050 and 800 ppm or more by the end of the century.[95] If these forecasts are realized, further acidification of the world's oceans will occur, potentially reducing the pH an estimated 0.3 to 0.4 units by 2100 - a 150% increase in acidity over preindustrial times.

2.5 Biodiversity of Management Area

Biodiversity within the SCMR is high, supporting a wide array of flora and fauna. The reef within the reserve is known for its high diversity of coral species and its support of three nationally and regionally important spawning aggregation sites.

2.5.1 Ecosystems and Flora

The Sapodilla Cayes Marine Reserve stretches from the bathypelagic zone of the open sea to the shallow epipelagic waters of the continental shelf:

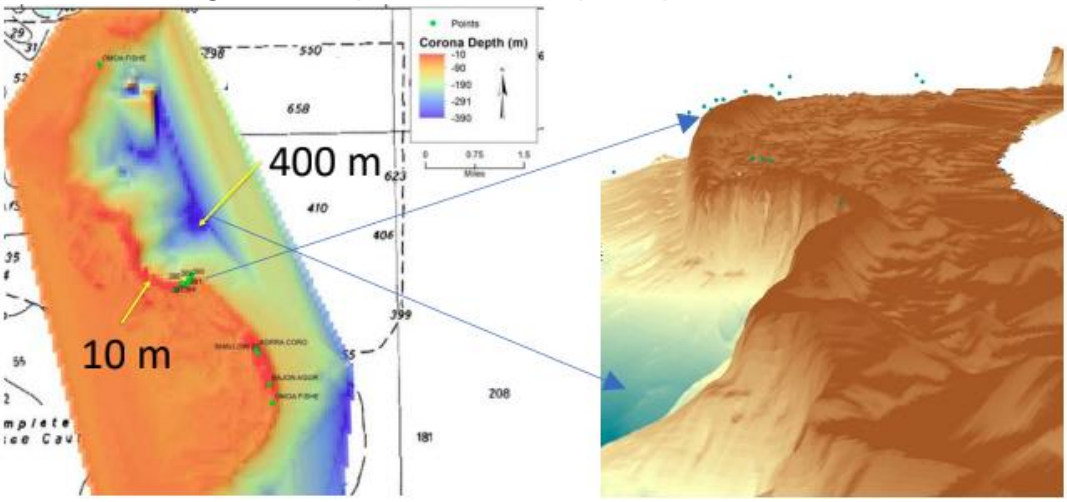
- Mesopelagic / Bathypelagic Zone (200m and deeper) - The Mesopelagic and Bathypelagic Zones include the deeper waters to the east of the barrier reef. The mesopelagic zone extends from a depth of 200m downwards, merging into the bathypelagic zone (which begins at the edge of the continental slope and extends beyond into the deeper water). The deep waters to the west, east and south of the 'hook' provide the geomorphology and oceanographic current conditions required by many species for the formation of spawning aggregations (Heyman et. al. 2008). Deep water species such as whale sharks are known to travel parallel to the reef, passing inside the boundaries of Sapodilla Cayes Marine Reserve.
- Epipelagic Zone (0m – 200m) - The Epipelagic Zone ranges from 0 to 200m depth, and includes the shallow waters of the inner lagoon and the deeper waters of the fore reef. Within this zone there are an array of ecosystems that have evolved in response to the degree of exposure and impact of wave action, current direction and intensity, light intensity and light spectra, and are defined by their species composition, formation and substrate characteristics. Six broad ecosystems have been identified and mapped (Map 10; Meerman, 2004):
    - Fore-reef (upper and lower reef slopes, including spur and groove topography)
    - Reef crest and reef flats
    - Back reef (with patch reefs)
    - Seagrass Sparse algae / sand
    - Herbaceous Beach Community.

Coral Reef - Located in the southern regions of the Belize Barrier Reef System, Sapodilla Cayes Marine Reserve encompasses the end of the barrier reef and terminates in a distinctive J-shape. Core habitats of Fore Reef, Reef Crest, and Back Reef are all present.

[94] Source: Woods Hole Oceanographic Institution (2021)
[95] Source: Intergovernmental Panel on Climate Change (2020)

- Fore-reef - The fore-reef lies on the outer side of the reef crest, facing the open sea, and includes the upper and lower reef slopes, extending out to a depth of 14-22m on three sides of the protected area. This structure follows the reef as it curves inwards to form the 'J'. Reef morphology shows a strong gradient from north to south along the ‘J’, with the northern reef being better structured, characterized by better developed spur and groove formations and terrace structure before dropping sharply into deep water.
- Reef Crest and Reef Flats - The reef crest and reef flats lie behind the fore-reef. Within the Marine Reserve, the reef crest is relatively fragmented, and is bisected by a number of larger reef channels, which allow greater connectivity between the coastal shelf and the deeper waters beyond the reef. Coral species inhabiting these areas are hardy enough to be able to withstand the breaking waves, constant strong current, exposure at low tide, and high light intensity. The reef crest is extremely vulnerable to extreme weather events such as tropical storms and hurricanes.
- Back Reef - The Back Reef includes a continuum of habitats from the algae-encrusted coral rubble near the reef crest to the sandy muds of the Thalassia meadows and scattered patch reefs, in waters ranging from 0.3 to 6m deep, and is sheltered on three sides by the ‘J’ shaped reef crest. There are numerous channels in the fore-reef at the SCMR which also provide connectivity between fore-reef and back reef zones as well as greater water exchange. The sheltered waters of the back reef promote the growth of spectacular coral formations and impressive sponges, with numerous patch reefs varying in size and orientation, interspersed among the seagrass meadows of the back reef. Some of the sites located in the shallower sheltered waters behind the reef crest support patch reefs of incredible diversity, with high live coral cover, making them popular attractions for snorkelers.
- Cayman Crown "Corona Reef"- This complex reef ecosystem lies in the southernmost boundary of the reserve, adjacent to a Guatemalan marine protected area. Initial reports are that it is one of the healthiest reef systems in the Caribbean and early indications are that it might support several spawning aggregation sites. The reef runs along a submerged trench line, and consists of a shallow ridge that is named the "Jewel". Additional exploration is needed to fully characterize the reef and the surrounding areas.

Figure 30: Cayman Crown early Bathymetric Studies[96]



Benthic Cover - There are several drivers of coral reef degradation of Caribbean reefs. For example, acropora corals, small polyped stony corals, experienced 90–95% mortality due to white-band disease in the 1980s.[97] Several other diseases have greatly reduced the cover of other coral taxa across the Caribbean, including black-band disease, which primarily affects brain corals,[98] yellow-band disease, which primarily affects Orbicella spp.,[99] and stony coral tissue loss disease, which affects numerous species, including Dendrogyra cylindrus, commonly known as Pillar Coral, which is found within the SCMR.[100] These diseases, likely exacerbated by ocean warming,[101] coupled with the increased frequency and intensity of hurricanes have been the primary driver of reduced habitat complexity of reefs across the Caribbean, including Belize.[102]

In addition, increased sedimentation from coastal development affects coral reefs by increasing turbidity and smothering corals. Secondary drivers include factors that have increased the cover of fleshy macroalgae (seaweeds) which suppress coral recovery, potentially via effects on coral microbiomes.[103]

According to 2007-2008 assessments of 96 sites across Belize, the percentage of live coral cover for the SCMR averaged 9.9% which was lower than the national average of 16.6% at the time.[104] However, there are sites within the marine reserve that exhibit exceptional coral cover and diversity such as the Corona Reef area. Surveys carried out by the SEA in 2007 found live coral

[96] Source: LGL Ecological Research Associates, Inc. (2018)
[97] Source: Aronson RB, Precht WF. White-band disease and the changing face of Caribbean coral 428 reefs. Hydrobiologia. 2001;460:25–38.
[98] Source: Edmunds PJ. (1991, as cited in Alves et al (2021))
[99] Source: Bruckner et al (2006, as cited in Alves et al (2021))
[100] Source: Alvarez-Filip et al (2019, as cited in Alves et al (2021))
[101] Source: Randall CJ et al (2015, as cited in Alves et al (2021))
[102] Source: Alvarez-Filip et al (2009, as cited in Alves et al (2021))
[103] Source: Beatty et al (2018)
[104] Source: McField, et al. (2008)

cover ranging from 13% to 46% across dive sites within the Corona Reef.[105] The 2020 Healthy Reefs Report Card found that benthic cover within the Southern Barrier Reef Complex remained generally healthy with around 16% of live coral cover throughout.[106]

Coral Diversity - The SCMR hosts nine species of coral considered critically endangered or endangered on the global scale.

Table 20: Coral Species of International Concern within SCMR

Species		Status
Staghorn Coral	Acropora cervicornis	Critically Endangered
Elkhorn Coral	Acropora palmata	Critically Endangered
Lamarck's Sheet Coral	Agaricia lamarcki	Endangered
Pillar Coral	Dendrogyra cylindrus	Endangered
Elliptical Star Coral	Dichocoenia stokesii	Endangered
Fire Coral	Millepora striata	Endangered
Star Coral	Montastraea annularis	Endangered
Star Coral	Montastraea faveolata	Endangered
Montastraea Coral	Montastraea franksi	Endangered
Rough Cactus Coral	Mycetophyllia ferox	Endangered

Although a thorough survey of coral diversity has not been conducted, at least 21 coral species have been regularly recorded on the back reef of SCMR.[107]

Coral Health - On a global level, coral reefs are under tremendous strain due to increased temperatures, increased agricultural runoff, ocean acidification, and direct human impacts. The 2020 Mesoamerican Reef Report Card found that the Southern Barrier Reef Complex was in FAIR condition (on a scale of 1-CRITICAL to 5-VERY GOOD) and found that reef health generally declined in the SBRC since 2018.

Table 21: Reef Health in Belize

Subregion	RHI	Live Coral (% cover)	Fleshy Macroalgae (% cover)	Commercial Fish (g/100m2)	Herbivorous Fish (g/100m2)
North Barrier Reef Complex	2.3	11	22	493	990
Central Barrier Reef Complex	3.0	14	17	845	2891

[105] Source: SCMR Management Plan 2011-2016
[106] Source: Mesoamerican Reef Report Card (2020)
[107] Source: SCMR Management Plan 2011-2016

South Barrier Reef Complex	3.3	16	27	1575	4685
Turneffe Atoll	2.5	19	15	505	2415
Lighthouse Reef	3.0	22	11	514	2064
Glover's Reef	2.8	25	16	465	1910
Belize	3.0	17	19	824	2744

Seagrass - Seagrass is the most extensive ecosystem within the Belize Barrier Reef and three atolls. Seagrass meadows start immediately west of the back reef and spread through the lagoons stabilizing sediments found on the seabed and maintaining productive lobster fishing grounds. The three species of seagrass in Belize are: the turtle grass (Thalassia testudinum), the manatee grass (Syringodium filiforme), and the shoal grass (Halodule wrightii).[108]

Within the SCMR, the shallow reef of the sheltered lagoon supports varying densities of turtle grass (Thalassia testudinum), interspersed with sparse strands of manatee grass (Syringodium filiforme). The shallow waters between Tom Owen's Cayes and Ragged Caye are dominated by seagrass, with a number of dominant algal species - Penicillus capitatus, Rhipocephalus phoenix and Udotea flabellum. The only common coral species is Manicina areolata.[109] A 2013 study within the adjacent Port Honduras Marine Reserve (PHMR) found that it contained a total of 7,380 acres of seagrass meadows comprising just over 10% of the reserve's area. There is a need for similar assessments within the SCMR.[110]

2.5.2 Fauna

Fish - The SCMR hosts over 230 species, four (4) of which are considered to be Critically Endangered or Endangered at a global scale, including the critically endangered goliath grouper (Epinephelus itajara), and endangered Nassau grouper (Epinephelus striatus) and great and scalloped hammerheads (Sphyrna mokarran and lewini).

Table 22: Fish Species of International Concern

Species		Status
Goliath Grouper	Epinephelus itajara	Endangered
Nassau Grouper	Epinephelus striatus	Endangered
Great Hammerhead	Sphyrna mokarran	Endangered
Scalloped Hammerhead	Sphyrna lewini	Endangered

[108] Source: CZMAI (2019)
[109] Source: SCMR Management Plan 2011-2026
[110] Source: Cherrington, Emil A. Baseline assessment of seagrass and mangrove cover and dynamics in the Port Honduras Marine Reserve, Belize. Panama City, Water Center for the Humid Tropics of Latin America & the Caribbean (CATHALAC), 2013.

Queen Triggerfish	Balistes vetula	Vulnerable
Hogfish Lachnolaimus	maximus	Vulnerable
Mutton Snapper	Lutjanus analis	Vulnerable
Cubera Snapper	Lutjanus cyanopterus	Vulnerable
Yellowmouth Grouper	Myctoperca interstitialis	Vulnerable
Whitelined toadfish	Sanopus greenfieldorum	Vulnerable
Splendid toadfish	Sanopus splendidus	Vulnerable
Whale Shark	Rhincodon typus	Vulnerable
Rainbow Parrotfish	Scarus guacamaia	Vulnerable

Most of these species are directly impacted by commercial fisheries. In order to ensure sustainability of the national fish stock, fisheries legislation imposes size limits and makes it illegal to take key species such as Nassau grouper during the peak spawning months of December to March.

Sharks are also an important part of the ecosystem at the SCMR but are also impacted by fishing activity with active shark fishing camps located in Southern Belize as recently as 2007.[111] The threatened whale shark (Rhincodon typus) is protected under the Fisheries Act, with no fishing, or even touching, permitted. This species is an important tourism resource, especially within the spawning aggregation area of the adjacent Gladden Spit and Silk Cayes Marine Reserve.

Mammals - There are four (4) species of dolphins common to Belize and that may be spotted within the reserve:

- Atlantic bottlenose dolphin
- Atlantic spotted dolphin
- Rough toothed dolphin
- Spinner dolphin

The Belize coast is home to the largest population of Antillean manatee in the Caribbean, with regular sightings around the Belize City/St George's Caye area, the Corozal Bay/ New River, Gales Point Manatee/Southern Lagoon, Placencia/Monkey River and Punta Gorda. Antillean (or West Indian) manatees (Trichechus manatus manatus) are known to use the cayes in the adjacent Port Honduras Marine Reserve and are known to use the inner cayes near Gladden Spit. Today, the Antillean manatee is considered threatened throughout its range, and is listed as 'Vulnerable' and is fully protected under the Wildlife Act.

Birds - The Sapodilla Cayes provide a crucial habitat for a wide range of migratory birds. There is no full species list to date, as comprehensive surveys still need to be completed during the migratory season. Several cayes within the reserve serve as important nesting locations for a

[111] Source: Graham (2007)

variety of tern and gull colonies, including bridled terns, roseate terns, and laughing gulls.[112] The Caribbean subspecies of Osprey (Pandion haliaetus ridgwayi), an important predator of the marine environment and indicative of the health of the trophic structure, also nests on the cayes. This subspecies has a limited global distribution, with Belize representing the southern extent of its range.

The Sapodilla Cayes are also an important stopover point for migrants as they move south in autumn and north in spring between North American breeding grounds and Central and South American wintering grounds. Species that have been observed to transit through the reserve include wood warblers, tanagers, thrushes, and tyrant flycatchers.[113] These Cayes provide stopping-off points with critical forage and shelter for these birds as they pass through on their long semi-annual journeys.

Reptiles - The conservation priorities for the herpetofauna of Sapodilla Cayes Marine Reserve relate to the three species of sea turtle known to use the area: the critically endangered hawksbill (Eretmochelys imbricata) and the endangered green turtles (Chelonia mydas), and loggerhead (Caretta caretta). Rangers and biologists have been monitoring turtle nesting populations at the Sapodilla Cayes Marine Reserve since 2005.

Data collected by SEA between 2008 and 2011 revealed an estimated average nesting success rate of 68% to 81%.[114] In 2010, turtle nesting was particularly prevalent on Lime Caye (at least 11 nests) and Nicholas Caye (at least 6 nests), with 3 nests also observed at Hunting Caye.[115] The hawksbill turtle tends to be more confined to shallow waters than loggerhead and green turtles, where it feeds primarily on sponges and marine invertebrates. It has a protracted nesting season of 6 months or more – peaking in June and July, with the period between nesting seasons generally being 2-4 years, sometimes longer.

In 2020, the BFD began work on a Sea Turtle Nesting Site Monitoring Plan to facilitate inclusion of nesting beach monitoring into marine reserve work plans. Data collection and monitoring activities have taken place at Tom Owens Caye, Northeast Caye, Frank's Caye, Nicholas Caye, Hunting Caye, Lime Caye, Ragged Caye and Seal Caye within the SCMR. These islands represent the most important nesting sites for sea turtles within the SCMR. An outline of initial findings are provided below.

Table 23: Sea turtle nesting observations 2020

Island	Findings
Tom Owens Caye	● Sightings of nesting turtles appear to be rare but hawksbills and loggerheads are known to nest on the island. ● Erosion and flooding is an issue for sea turtle nests. In the past, nests that have been found in low areas close to the shoreline have been relocated to nests on higher ground.

[112] Source: SCMR Management Plan 2011-2016 (SEA staff; Walker site visit, 2010)
[113] Source: Ibid.
[114] Source: State of the Parks (2007)
[115] Source: SCMR Management Plan 2011-2016

	● There are no records indicating that relocation protocols have been followed when relocating nests. ● There is no data available on the success rate of the relocated nests. ● In 2020, two loggerhead nests were reported. Expeditions in August of 2020 revealed that one nest contained 136 eggs. This nest was relocated because it was laid in a low area that becomes flooded with rain water. Follow-up on the relocated nest has to be conducted.
Northeast Caye	● Exact locations of nesting sites have not been documented.
Frank's Caye	● Exact locations of nesting sites have not been documented.
Hunting Caye	● Exact locations of nesting sites have not been documented.
Lime Caye	● Exact locations of nesting sites have not been documented.
Ragged Caye	● Some nesting activities observed but no confirmed nests.
Seal Caye	● No nesting activities observed. Lack of nesting is believed to be due to the surrounding sea wall of the island.

In addition to marine turtles, three (3) terrestrial reptile species have been recorded on the Sapodilla Cayes: the brown anolis (Anolis sagreil), the St. George's island gecko (Aristelliger georgeensis), and the green iguana (Iguana iguana).

2.5.3 Economically Important Species

The SCMR plays an integral role in maintaining the viability of the Belizean fisheries industry. Commercially important species include:[116]

- Caribbean Spiny Lobster (Panulirus argus)
- Queen conch (Strombus gigas)
- Groupers (Epinephelus sp. and Mycteroperca sp.)
- Snappers (Lutjanus sp. and Ocyurus sp.)
- Hogfish (Lachnolaimus maximus)
- King mackerel (Scomberomorus cavalla)
- Great barracuda (Syhyraena barracuda)
- Jacks (Alectis sp., Caranx sp. and Trachinotus sp.)

Lobster - Lobster has traditionally been a major fisheries target at the Sapodilla Cayes Marine Reserve. Most lobster fishermen within the SCMR use hook sticks to capture lobsters while free diving, although there is some scattered use of shades and traps.[117] Data on catch volumes within the SCMR is not readily available.

[116] Source: FAO (2010)
[117] Source: SCMR Management Plan (2011).

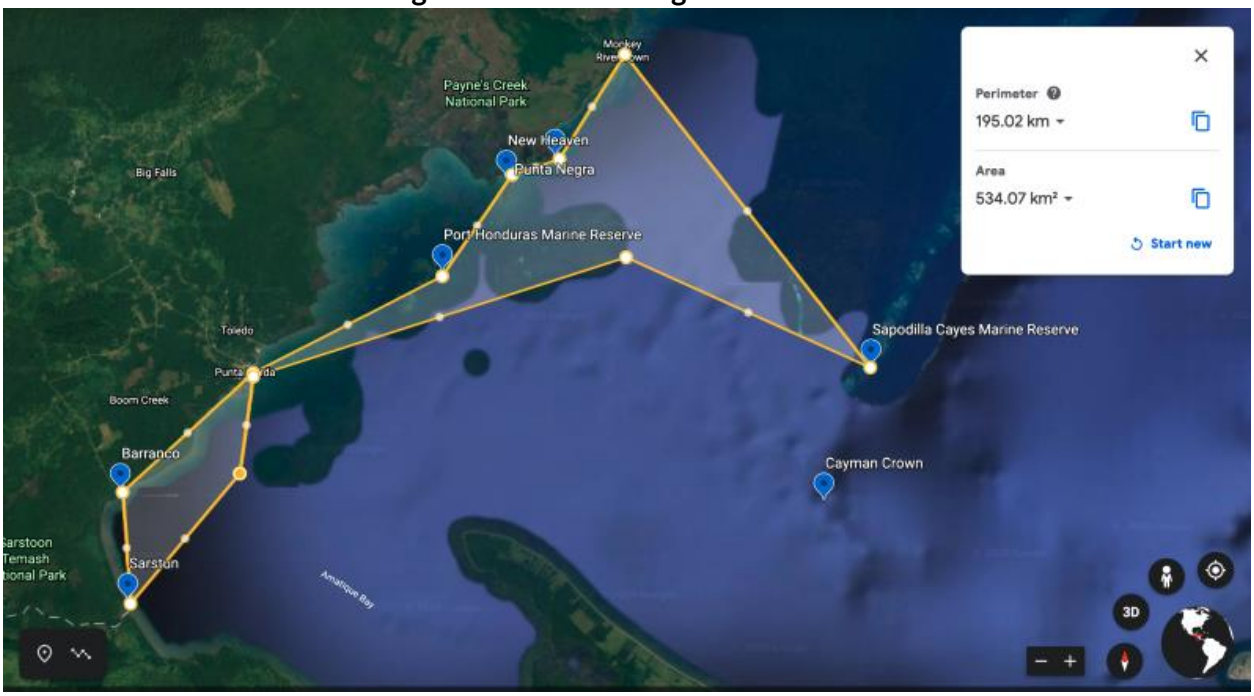
Queen Conch - Sapodilla Cayes Marine Reserve also boasts high densities of juvenile conch. Previous studies have found densities as high as 3,000 individuals per hectare.[118]

Finfish - Nationally, finfish exports have been gradually declining since 2010, with total exports in 2018 valued at just under US $100,000, compared to more than US $900,000 in 2010[119]. Notably, the decline was largely due to the shift for high-end exports such as lobster. In fact, Rainforest Seafoods stopped purchasing Finfish. Species harvested for local consumption include grunts (Haemulidae), mullets (Mugilidae), porgies (Sparidae), triggerfish (Balistidae), and tarpon (Megalopidae). Tarpon is protected and cannot be fished commercially.

2.6 Cultural and Stakeholder Use of SCMR

Fisherfolk - Several communities in southern Belize are considered long term stakeholders as it relates to the SCMR.

Figure 31: Surrounding Communities



Historically, fishermen from mainland communities of Barranco, Monkey River, Punta Negra and Punta Gorda have operated within the protected area from temporary fishing camps established on various of the cayes within the reserve.[120] Fishing camps have also been observed on Tom Owen's Northeast, and Frank's & Seal Cayes.

Legal fishing activity, through commercial fishing licenses, occurs along the southern and eastern edges of the reserve, within what is now delimited as Conservation Zone IV. Illegal fishing activity

[118] Source: Ibid. Data from SEA.
[119] Source: UNCTAD (2019)
[120] Source: TASTE/ Nightingale (2004)

is still a major concern, with community members reporting that there is a significant presence of Guatemalan and Honduran fishermen who do not respect no-take zones or size regulations. In addition to traditional resources such as finfish, conch and lobster, there is also growing demand for non-traditional resources such as sea cucumbers, which also attracts illegal activity.

Discussions with stakeholders from the surrounding communities of Monkey River, Punta Gorda and Punta Gorda reveal the following concerns:[121]

- Local fishermen expressed discontent with the implementation of the compensation package as part of the national gillnet moratorium. Licensed gillnet fishermen were told they would qualify to receive compensation in exchange for their pledge to stop using gillnets. However, several fishermen revealed that compensation had not been received and pointed to tight economic conditions due to the pandemic as a potential catalyst for the use of gillnets.
- Local fishermen also revealed that illegal fishing by Guatemalan and Honduran fishermen is widespread around the southern boundary of the SCMR, with many reporting that fishermen from these surrounding communities tend to come at night and do not abide by fisheries regulations such as size thresholds
- Fishermen from the Village of Monkey River expressed particular concern about agricultural and sand-mining activity occurring upstream that has led to erosion at the river mouth and has affected marine life due to high-levels of agricultural chemicals
- Fishermen also expressed the need for streamlining the commercial fishing license application process - potentially creating a one-stop shop for commercial fishing licenses, captain licenses, and vessel registration.
- The economic strain due to the Covid-19 pandemic was at the forefront in discussions held with the surrounding communities. They expressed that they were generally fishing more frequently to be able to make ends meet. With significant uncertainty remaining as to the trajectory of the virus in Belize, fishermen will remain vulnerable.
- In a recent meeting between the potential co-manager's staff and fishermen it was revealed that many fishermen are unaware of the expansion of SCMR and are concerned about them not being able to use the new conservation zones that they have been using for some years. They are asking for a revisit of conservation zones to include special management areas by customary users.

Military Base - In 1964, the Belizean government nationalized the Sapodilla Cayes on the basis of "national security".[122] In September 1981 the Government of Belize established a military base on Hunting Caye (TASTE / Nightingale, 2004), with the principal duties of monitoring the activities of sea and air vessels within the southern territorial waters of Belize. The establishment of this base was in response to growing territorial claims from Guatemala. The base houses a rotating corps of the Belize Coast Guard and the Belize Defense Force who conduct patrols within the area. However, stakeholder consultations reveal that patrols are limited to the Cayman Crown Area, with very little presence north of the Corona Reef.

[121] A detailed stakeholder engagement plan is included in Annex B.

[122] Source: (1976 Provisional Index to the Cayes of Belize)

Immigration - Hunting Caye is considered a port of entry for visiting tourists from Guatemala and Honduras. This "unofficial" check-point came about as a result of a verbal agreement made between the Government of Belize, Guatemala and Honduras to facilitate the influx of tourists from these countries (TASTE / Nightingale2004). Given this arrangement there has always been some system of tracking visitors to the reserve at Hunting Caye. Beginning in 1994, before the declaration of the Marine Reserve, a ten dollar US entrance fee for foreign visitors was implemented. Fees were collected by the Belize Tourism Board who stationed one staff member on Hunting Caye specifically to collect entrance fees and track visitation. In 2005 the Belize Fisheries Department took over the responsibility of accessing entrance fees and checking foreign tourists into and out of the Marine Reserve.

Port Authority - A lighthouse was constructed on Hunting Caye in 1983 to facilitate the passage of merchant ships along the southern coast of Belize and into the Gulf of Honduras The present lighthouse on Hunting Caye is located on the south-eastern point of the caye and stands 65 feet tall with a range of 12 miles and continues to serve its function as an international maritime navigational marker, operating on solar energy. The lighthouse has traditionally been staffed by two employees of the Belize Port Authority who live in a two-story house constructed on Hunting Caye.[123]

Recreation and Tourism Use - The majority of the visitors to the Sapodilla Cayes Marine Reserve originate from Guatemala or Honduras. Guatemalan and international tourists arrive on charter trips from Santo Tomas or Puerto Barrios (Guatemala) or by private vessel. Whilst most Honduran visitors would visit the reserve on their own private vessels (mostly cabin cruisers). Belize live-aboard charter boats from The Moorings and TMM, which operate out of Placencia, also visit the area. All boats that enter the Marine Reserve must check in and pay visitation fees at Hunting Caye. Visitation records, however, have not been consistent, the last viable figures being from 2004 - ongoing, accurate record-keeping needs to be prioritized. Traditionally the Sapodilla Cayes has been a common excursion destination for Guatemalans and Hondurans during national and religious holidays. There is increased cultural use of the Marine Reserve as a recreational resource at Easter, with many Hondurans and Guatemalans visiting the area, and camping overnight on Lime, Hunting or Nicholas Caye (Gale, 2004). Traditionally these two to four day excursions would bring people and facilities from Guatemala or Honduras to set up during the holiday periods. In recent years there has been a decrease in these types of visitors with Lime caye now being the primary destination for these groups. Tourism visitation during this period was the major impetus for the construction of bioremediation toilets and showers on Hunting Caye in an attempt to minimize the impacts of such large influxes of visitors.

The area has also been used by smaller cruise ships for some time. In 2006 regular visits by the Seabourne cruise line began. The vessel “Seabourne Legend,” makes six trips annually, bringing approximately 200 cruise visitors to Hunting Caye for day excursions. SEA has facilitated these visits, assisting in the building and maintenance of facilities including a series of palapas, a new pier, and grill as well as providing staff for these visits, as a direct support for the Toledo Tour Guide Association (TTGA) and other local stakeholders. This has been a valuable asset to the TTGA.

[123] Note: Communication with the potential co-manager staff reveals that housing for Port Authority staff is in disrepair which prevents continuous on-site presence.

In the past, SEA has supported increased visitation by tourists originating in Belize through greater engagement with Belizean tour guides. Some projects aimed at boosting visitation have included the construction of a kitchen/bar on Hunting Caye and the development of toilet and shower facilities.

Educational and Research Use - The Living Reef Centre has been an important educational resource for hosting local stakeholders and students. The Centre has hosted a number of local groups for training programs. The Community Researcher program, started by TASTE and further enhanced by SEA with support from COMPACT, which trained a number of local stakeholders in research and monitoring techniques so that they could assist with biological monitoring used the centre and the marine resources of the SCMR to train local people. The Toledo Tour Guide Association has also used the facilities to offer marine training programs to some of their members in the past.

Archaeological Context - The mainland coast and many of the offshore cayes of Belize were once used as fishing stations, commercial posts, settlement areas, and burial and ceremonial centres by the ancient Maya.[124] The Point Placencia Archaeological Project (PPAP) expedition in 1985-1986 led to the discovery of several eroded shards and obsidian on Tom Owen's, Northeast Sapodilla and Hunting Caye. Pottery shards unearthed on Lime Caye were identified as an historic midden during the same study.[125]

The reefs and currents around the Sapodilla Cayes area have led to several groundings. The lighthouse on Hunting Caye serves to guide vessels through the channel just to the north of the island. Notable shipwrecks within the reserve include that of the "Spanish Merchantman", dated between 1580 and 1780.[126] The visible remains consist of ballast, three anchors and 3 cannons Preliminary excavations revealed that cultural material is preserved beneath the ballast.[127] A shipwreck thought to date to the 1970's is located on the fore reef between Hunting and Lime Cayes. This metal wreck is well preserved and is home to an abundance of schooling fish. The wreck has been mostly colonized by coral making it a popular destination for tourists and day snorkelers.

3.0 Conservation Planning

Conservation planning is a structured process that identifies and assesses the species and ecosystems of concern, the threats that impact them, and the strategies that can be used within the management of the area to mitigate these threats.

3.1 Conservation Targets

Conservation targets include species, species assemblages or ecosystems that have been selected as representing the biodiversity of the SCMR. The conservation and protection of these species and ecosystems is crucial to ensure positive biodiversity outcomes. A review of previous

[124] Source: SCMR Management Plan (2011)
[125] Source: Ibd.
[126] Source: Ibid.
[127] Source: Ibid.

management plans, consultations with the BFD staff and stakeholders led to the identification of the following conservation targets:

- Littoral Forest
- Herbaceous Beach Vegetation/ Sandy Beaches
- Coral Reef Communities
- Seagrass
- Commercial/ Recreational Species
- Spawning Aggregations
- Sea cucumbers (non-traditional marine products)
- Sea turtles
- Sharks

3.1.1 Littoral Forest

The littoral forest is an important component of the Neotropical migratory bird route, with species moving down the outer Atolls of Lighthouse Reef and Glover's Reef, on to the Sapodilla Cayes, and from there to Guatemala and Honduras.

Nested within the Littoral Forest target are a series of associated plant species, bird, reptile, and crustacean species. A top priority is the conservation of Red mangrove which is currently found on 2 cayes - Seal and Franks Cayes. Franks Caye has the largest extent of mangroves in shallow water, whilst Seal Caye has mangroves extending into deeper water. Mangrove restoration activities have been attempted on Hunting Caye in the past but suffered due to poor coordination with other management activities and lack of resources. Up-to-date information on the state of littoral forests within the SCMR is not available. The snapshot provided below is based on historical data collected in 2011.

Table 24: Littoral Forest Snapshot

Category	Indicator	Poor	Fair	Good	Very good	Current status
Size/ extent	Total area of littoral forest					TBD
Connectivity among communities and ecosystems	Level of fragmentation within littoral forest system	Some cayes have no natural vegetation cover	All cayes have at least 15% natural vegetation cover	All cayes have at least 25% - 50% natural vegetation cover	All cayes have at least 50% natural vegetation cover	FAIR
Community architecture	% Littoral Forest in natural condition	<50% of Littoral Forest shows human	50 - 74% of Littoral Forest shows human	75% - 99% of Littoral Forest shows human	No Littoral Forest shows human impacts	TBD

		impacts	impacts	impacts		
Abundance of food resource	Abundance and diversity of migratory birds	Few migratory birds stop over	Abundance and diversity of migratory birds reduced	Current abundance and diversity of migratory birds	Increased abundance and diversity of migratory birds	TBD
Size / extent of characteristic community	Total area of mangrove					TBD
Community architecture	% Mangrove in undisturbed condition	<50% of mangrove forest shows human impacts	50 - 74% of mangrove forest shows human impacts	75% - 99% of mangrove forest shows human impacts	No mangrove forest shows human impacts	TBD
Ecosystem Functionality	Abundance and diversity of juvenile fish in mangroves					TBD

3.1.2 Sandy Beaches

Sandy beaches are constantly shifting, with natural erosion and deposition occurring in response to tide, wind and storm actions. The herbaceous beaches are considered very important for the stabilization of turtle nesting sites and providing shelter for ground nesting birds.

The Sapodilla Cayes are also considered important for congregating and ground nesting birds, hosting large numbers of laughing gulls, and sooty, bridled and roseate terns.[128] The sandy beaches are also used by visitors to bathe, picnic, and land vessels. The location and extent of beach area found on each of the cayes fluctuates significantly on an annual basis in accordance with currents and storm action. Hurricane activity in the past has had substantial impacts on many of the islands within the SCMR, changing the shapes and sizes of several islands.

The critically endangered hawksbill turtle nests on the beaches of a number of the cayes, with over 100 nests reported from the Pompion-Ranguana-Sapodilla Cayes area (southern SBRC) in 1989, 60 of these being on Nicholas Caye.[129] A 2010 survey provided data on nests within the SCMR, and revealed that all three species used Nicholas Caye as a nesting site whereas only Hawksbill turtles were reported to nest Lime and Hunting Cayes.

[128] Source: SCMR Management Plan (2011)
[129] Source: Smith (1989) as cited in SCMR Management Plan (2011)

Bridled terns and laughing gulls have been found to breed on Ragged Caye and possibly Seal and Tom Owens Cayes.[130] Large congregations of Roseate terns have also been reported in the past but nesting has not been confirmed for this species in the SCMR.[131] Laughing gulls also nest on Lime Caye and Sand Bar.

Table 25: Sandy Beach Snapshot

Category	Indicator	Poor	Fair	Good	Very good	Current status
Size / extent of characteristic community	Total extent of beaches and beach communities					TBD
Community architecture	% of sandy beach altered for tourism					TBD
Community architecture	% beaches and beach communities in natural condition					TBD
Presence / abundance of key species	Number of turtle nests per species					TBD
Presence / abundance of key species	Number of ground nesting bird species					TBD
Presence / abundance of key species	Number of nests per bird species					TBD

3.1.3 Coral Reef Communities

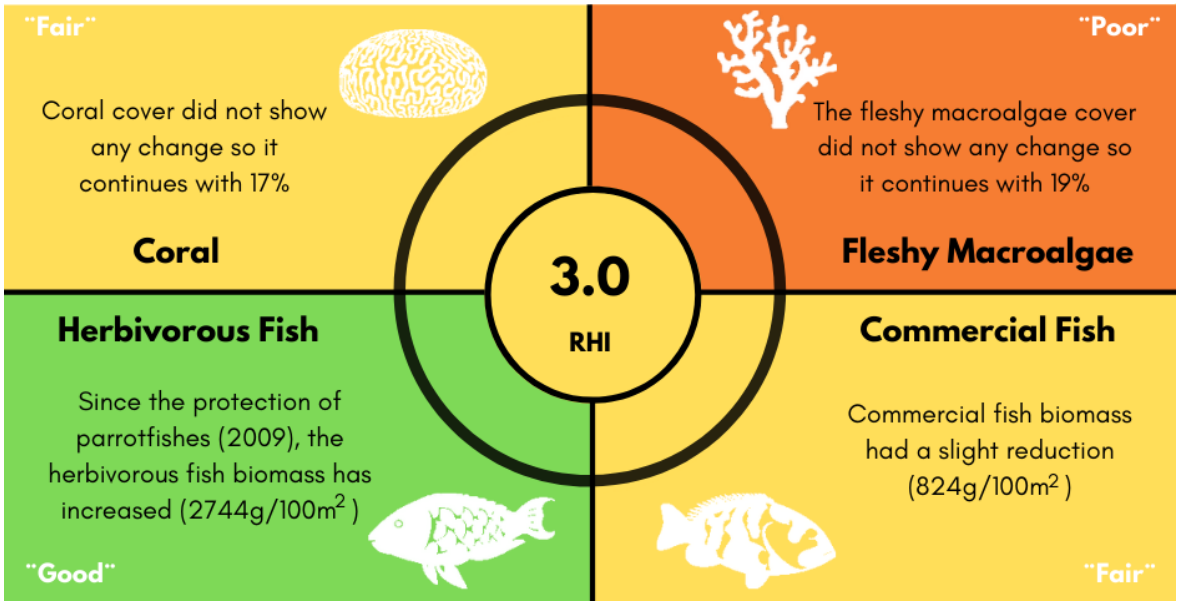
The SCMR contains a distinctive J-shaped hook at the terminus of the Belize Barrier Reef. In 2020 there were two significant assessments of the Belize Barrier Reef System: The Healthy Reef Report Card and the UNESCO BBRS Conservation Outlook Assessment.

Healthy Reef Report Card

[130] Source: SEA data; Site Visit (2010) as cited in SCMR Management Plan (2011)
[131] Source: Jones (1998) as cited in SCMR Management Plan (2011)

A Mesoamerican Reef Report Card has been developed every two years by Healthy Reefs for Healthy People since 2006. The major reef-subregions in Belize were all assessed for health in terms of coral, herbivorous fish, fleshy macroalgae, and commercial fish. National results are provided below.

Figure 32: 2020 Healthy Reef Report Card for Belize



In terms of sub-regional health, the Southern Barrier Reef, which overlaps with the SCMR, was found to be the healthiest in the country. Findings for the SBRS are as follows:

- Had the best reef health (3.3) although down from 3.8 in the last report.
- Fleshy macroalgae reached critical levels, increasing from 22% to 27%, likely due to terrestrial, including transnational, runoff.
- Herbivorous fish increased from 4194 to 4685g/100m^2—the highest value nationwide.
- Commercial fish declined from 2002 to 1575g/100m^2

UNESCO Conservation Outlook

The 2020 assessment found that the conservation outlook for the Belize Barrier Reef System necessitated significant concern. The report identified systemic, wider scale issues such as coastal development, tourism growth, invasive species and the multiple impacts of climate change as key threats to the integrity of the site and its values. The report concludes that there needs to be a demonstrable plan to ensure that the threats to the site's values can be controlled in the long-term.

The report identified and rated the following current threats in terms of severity and extent.

Table 26: Current conservation Threats

Threats	Severity	Extent
Invasive non-native/ alien species	Very High	**Widespread (15-50%)**
Temperature extremes, storms/ flooding	Very High	**Throughout (>50%)**
Ocean acidification, temperature extremes	High	**Throughout (>50%)**
Water pollution	Low	**Localised (<5%)**
Tourism/ visitors/ recreation	Very High	**Localised (<5%)**
Fishing/ harvesting aquatic resources	High	**Widespread (15-50%)**

The reef ecosystems of the SCMR include fore-reef, back-reef, reef slope, and patch reef. These reef types are composed of many coral species, including ten critically endangered or endangered species:

- Staghorn Coral
- Elkhorn Coral
- Lamarck's Sheet Coral
- Pillar Coral
- Elliptical Star Coral
- Fire Coral
- Star Coral
- Montastraea Coral
- Rough Cactus Coral

In addition to supporting flora, the coral reefs within the SCMR provide a diverse range of habitats for a multitude of fish and invertebrates, including commercially important species, of which at least three are IUCN red listed as critically endangered or endangered: Goliath Grouper, Nassau Grouper, and Great Hammerhead. Herbivores such as the large parrotfish are critical in maintaining a healthy reef by reducing macroalgal cover, ensuring coral recruitment sites are available for continued coral health, particularly in recovery following bleaching episodes.

Table 27: Coral Reef Community Snapshot

Category	Indicator	Poor	Fair	Good	Very good	Current status
Population Structure and Recruitment	% Average live coral cover	<10%	10 - 19.9%	20 - 39.9%	>40%	TBD
Presence / abundance of key species	% Recent coral mortality	>4%	2-4%	< 2%	0%	TBD
Presence / abundance of key species	Level of coral recruitment	> 2 / m^2	2 recruits /m^2 – 4.99/m^2	5 recruits/m^2 – 9.99/m^2	≥10 recruits /m^2	TBD
Presence / abundance of key species	Commercial fish biomass	<700 g/100m^2	700 - 1399 g/100m^2	1400–2799 g/100m^2	>2800 g/100m^2	TBD
Species Dominance	% Macroalgal cover					TBD
Coral Bleaching	% survey sites showing coral bleaching per annum	>10%	5-10%	<5%		TBD

3.1.4 Seagrass

Seagrass meadows are essential for maintaining the ecological health of the shallow marine ecosystems within the reserve. They capture the sun's energy to generate food and oxygen for animals; provide habitat for fish and shellfish that feed people and form the backbone of coastal businesses; stabilize sediments; and absorb the power of waves, helping to stave off erosion and protect coastlines from storms. They also soak up climate-changing carbon and polluting runoff. Manatees and turtles nourish themselves on the swaying blades and young fish begin life there, and shrimp and crabs find shelter.

- Seagrass meadows are believed to be the third-most valuable ecosystem in the world after estuaries and wetlands - just two and a half acres of seagrass provides habitat, erosion control, and other benefits with an estimated value of nearly US $29,000 per year.[132]
- A single acre of seagrass can support nearly 40,000 fish and 50 million small invertebrates, such as lobsters and shrimp.[133]

[132] Source: R. Costanza et al., "Changes in the Global Value of Ecosystem Services," Global Environmental Change 26 (2014): 152-58, http://dx.doi.org/10.1016/j.gloenvcha.2014.04.002.
[133] Source: Reynolds, "Seagrass and Seagrass Beds."

- More than 100 times as many animals gain shelter and nourishment in seagrass beds as on adjacent bare sand.[134]
- Seagrasses stabilize sediments and reduce wave action by 20%, slowing beach erosion and lessening storm damage to coastlines.
- Seagrass mitigates the effects of climate change by absorbing about 10% of the total estimated organic carbon sequestered in the world's oceans each year.[135]

Two species of seagrass are present within the Sapodilla Cayes Marine Reserve – Turtle Grass (Thalassia testudinum) and Shoal Grass (Syringodium filiforme). Seagrass is also important for the juveniles of many commercial fish species. Parrotfish, herbivores that play a critical role in maintaining the reef, also rely on the seagrass beds as juveniles. The vulnerable West Indian manatee (Trichechus manatus) (IUCN, 2010) the largest of Belize's herbivorous marine mammals, as well as the endangered green turtles (Chelonia mydas) also rely on seagrass beds for nutrition. These species also play an important role in maintaining seagrass beds and increase the productivity of this ecosystem through grazing.

Table 28: Seagrass Snapshot

Category	Indicator	Poor	Fair	Good	Very good	Current status
Size / extent of characteristic community	% seagrass cover	< 50%	50% - 75%	75% - 90%	90%-100%	TBD
Community architecture	% seagrass impacted by anthropogenic activities					TBD
Primary Productivity	Seagrass density	0 - 29%	30-49%	50-79%	80 - 100%	TBD

3.1.5 Commercial/ recreational species

Commercial and recreational species support livelihoods and economic development primarily through the fisheries sector. The role of many of the target fin-fish species as top predators is also essential in reef community structure. Most commercially important marine species have complicated life cycles that rely on the health of the entire marine ecosystem – utilizing not just the reef, but also the seagrass beds and the mangroves at some point during their lives. The presence of large fish species is a good indication of a healthy reef. The two invertebrate species

[134] Source: Carruthers, Dennison, and DiCarlo, "Seagrasses: Prairies of the Sea"; D.A. Smale et al., "Spatiotemporal Variability in the Structure of Seagrass Meadows and Associated Macrofaunal Assemblages in Southwest England (U.K.): Using Citizen Science to Benchmark Ecological Pattern," Ecology and Evolution 9 (2019): 3958-72, doi:10.1002/ece3.5025.

[135] M.D. Spalding, R.D. Brumbaugh, and E. Landis, "Atlas of Ocean Wealth" (The Nature Conservancy, 2016),

of highest commercial importance extracted from the SCMR are the Caribbean Spiny Lobster (Panulirus argus) and Queen conch (Strombus gigas), both of which are fished extensively throughout the General Use Zone and targeted by illegal fishermen.

Table 29: Commercial/ recreational Species

Category	Indicator	Poor	Fair	Good	Very good	Current status
Population Size and Dynamics	Commercial fish biomass	<700 g100m^2	700 - 1399 g-100m^2	1400–2799 g-100m^2	>2800 g100m^2	TBD
Community architecture	% seagrass impacted by anthropogenic activities					TBD
Population Size and Dynamics	Conch density	< 50/ha	50 – 200/ha Excl. nursery	200 – 500 / ha	>500 / ha (Incl. nursery)	TBD
Population Size and Dynamics	Lobster density					TBD
Population Size and Dynamics	CPUE per year per boat - recreational	<100lbs	100 - 199 lbs	200-299 lbs	>300lbs	TBD
Population Size and Dynamics	Parrotfish biomass	1-1250g /100m^2	1250.01 - 4650g /100m^2	>4650g / 100m^2		TBD

3.1.6 Spawning Aggregation Sites

In 2002, a coalition of seven non-governmental organizations along with the Belize National Spawning Aggregation Working Group lobbied the Government of Belize to completely protect 11 of the 13 Nassau grouper spawning sites within Belize.[136] Regulations enacted in 2003 introduced year round protection for the 11 sites and a four-month closed season at the national level inclusive of the SCMR. The regulations of 2009 established fishing minimum and maximum sizes. As of 2014, all 13 Nassau grouper spawning aggregations are fully protected. Data for the Nassau grouper for 2014 -2018 shows most spawning aggregation sites in Belize had less than 1,000 individuals.

Many of the groupers and snappers form large spawning aggregations at predictable times and places, making them very vulnerable to fishing pressure. Aggregation sites within the reserve are

[136] Source: CZMAI (2018)

critical to the maintenance of these fish species and, in Belize, are seasonally protected under SI 161 of 2003. Four sites are located within SCMR – three protected under the SI - Rise and Fall Bank, Nicholas Caye and Seal Caye – and one outside – the Elbow. Protected spawning aggregation sites (both through SI and through surveillance and enforcement presence) increase viability of commercially important fin-fish species such as grouper, snapper and jack, during the reproductive stage of their life cycle, providing important benefits to the fishing sector. In addition, expeditions within and around the Cayman Crown area indicate that additional SPAGs may exist.

Table 30: SPAG Snapshot

Category	Indicator	Poor	Fair	Good	Very good	Current status
Population Structure and Recruitment	Number of large, adult fish species at SPAG sites	< 25% of the spawning population are LARGE adults	25% - 35% of the spawning population are LARGE adults	36% - 50% of the spawning population are LARGE adults	>50% but <75% of the spawning population are LARGE adults	TBD
Species Composition / Dominance	Diversity of species at SPAG sites	< 5 species	5-9 species	10-15 species	>15 species	TBD

3.2 Viability Assessment

A viability assessment was conducted to determine the current status of each conservation target and to identify goals. Each Conservation Target was assessed using the following viability ratings:

- Very Good – The Indicator is considered to have an ecologically desirable status, requiring little or no intervention for maintenance.
- Good – The indicator lies within the acceptable range of variation, though some intervention is required for maintenance.
- Fair – The indicator lies outside the acceptable range of variation, and human intervention is required if the viability of the target is to be maintained
- Poor – Restoration of the conservation target is increasingly difficult, and impacts may result in extirpation from the conservation area

Table 31: Conservation Targets

Conservation target	2011 rating	2021 rating	Goal
Sharks	FAIR	UNKNOWN	FAIR
Seagrass	FAIR	UNKNOWN	FAIR
SPAGs	FAIR		FAIR

Coral reef communities	FAIR	UNKNOWN	FAIR
Littoral forest	POOR	UNKNOWN	FAIR
Commercial/ recreational species	FAIR	UNKNOWN	FAIR
Sandy beaches	FAIR	UNKNOWN	GOOD

3.2.1 Threats to Biodiversity

Threats to the SCMR are driven by human activity and natural processes. Human activity such as fishing and farming can adversely impact the reserve through unsustainable fishing practices and agricultural runoff, respectively. Natural disasters such as hurricanes can impact the reserve by destroying littoral forests, coral reefs, and sandy beaches. A threat assessment was conducted to inform management priorities for the reserve.

Table 32: Threat Assessment

Threat	Extent	Severity	Likelihood	Impact
Climate change	4	3	3	Very High
Runoff	2	3	4	High
Fishing pressure	2	3	3	Moderate
Illegal uses	2	3	3	Moderate
Visitor impacts	2	3	3	Moderate
Maritime traffic	3	1	3	Low
Invasive species	3	1	3	Low
Caye development	1	4	2	Low

Climate Change - Climate change is a global phenomenon and affects biodiversity throughout the Marine Reserve due to high sea surface temperatures, acidification, and rising sea levels. Warmer seas lead to acidification which drives coral bleaching and disrupts natural ecosystem cycles. Climate change also makes it more likely to experience harsher and more frequent storm events that can cause physical damage to beaches, coral reefs and littoral forests within the reserve. Natural disasters are also likely to disrupt supply chains for some time which can lead to undue pressures on the reserve's resources to meet basic needs such as food security.

Runoff - Pollution from land-based sources is a primary cause of coral reef degradation throughout the world.[137] As populations expand in coastal areas and large-scale agriculture increases, runoff increases. Runoff often carries large quantities of sediment from land-clearing, high levels of

[137] Source: NOAA (2021)

nutrients from agricultural areas and sewage outflows, and pollutants such as petroleum products and pesticides. These land-based sources of pollution threaten coral reef health.

Fishing Pressure - Unsustainable fishing practices such as the use of nets and other harmful fishing methods pose a significant risk to the natural resources within the reserve. Although positive steps have been taken in recent years to reduce fishing impacts through the banning of gill-nets, effective enforcement remains an issue. Fishing nets can destroy coral, capture young fish and leave behind non-biodegradable debris. Legal fishing is a vital economic driver in the region, but careful enforcement and monitoring is needed to ensure sustainability.

Illegal Uses - Illegal uses include illegal fishing, illegal resource extraction, illegal research activities, and illegal immigration. Illegal fishing depletes fish stock beyond accepted levels and threatens local food security. Illegal resource extraction of seagrass and other resources threaten ecosystem integrity. The remoteness of the cayes can also be exploited for illegal entry into Belize which can impact the reserve through increased traffic and human impacts.

Visitor Impacts - There are distinct areas of visitor activity within the reserve including popular dive sites, and areas adjacent to the cayes. Visitor levels can be high during the peak of the tourist season between late-November and mid-April. Increased visitation leads to more waste generated on the cayes, more boating activity which has its own impacts, and greater impacts on ecosystems from direct contact. The presence of visitors also leads to the use of insecticides, herbicides, and other chemicals that can runoff and cause accelerated algal growth and coral loss.

Maritime Traffic - Boats and ships produce the same sorts of chemical pollutants as other internal combustion engines: oxides of nitrogen (NOx), oxides of sulfur (SOx), particulate matter (PM), hydrocarbons (HC), carbon monoxide (CO) and carbon dioxide (CO2). These pollutants contribute to global warming and other adverse environmental effects. In addition to air pollution, marine vessels release pollutants such as oil and other waste by-products directly in the water. Reckless navigation can also cause physical damages to the coral reefs and beaches within the reserve.

Invasive Species - Invasive alien species (IAS) are animals, plants or other organisms that are introduced into places
outside of their natural range, negatively impacting native biodiversity, ecosystem services or human wellbeing.[138] Invasive species are one of the biggest causes of biodiversity loss and species extinctions, and are also a global threat to food security and livelihoods. Six invasive non-alien species have been identified in Belize to date, including the Lionfish. Invasive species can significantly impact natural resources within the SCMR and lead to reduced viability of fish populations, reduced coral reef health, reduced abundance of herbivores, and increased algal growth.

[138] Source: IUCN (2021)

Caye Development - The most significant impacts from caye development occur directly on the cayes themselves, with major impacts on terrestrial ecosystems and directly adjacent marine areas. Clearing of littoral forests and beach communities for development increases the potential for significant impacts on ecosystem integrity. The Department of the Environment is responsible for the enforcement of several Regulations made under the Environmental Protection Act which include the Environmental Impact Assessment Regulations (S.I. 107 of 1995), the Environmental Protection (Effluent Limitations) Regulations (S.I. 94 of 1995) and the Pollution Regulations (S.I. 56 of 1996) that govern development in ecologically sensitive zones. Careful and regular monitoring of development activities on the cayes within the reserve is a key role of management.

3.2.2 Planning for Climate Change

In 2011, a climate change resilience assessment was conducted for the Southern Environmental Association's (SEA) managed areas portfolio. Using this framework, an updated impact assessment was completed incorporating the latest data on climate change and its effects. Climate change impacts and their outlooks are provided below.

Table 33: Climate Change Impacts

Impacts	Current status	Outlook
Sea level rise[139]	Increased global average sea level rise rate of 3.4mm per year since 1993.[140]	Global mean sea level (GMSL) is projected to rise between 0.18 m and 0.23 m by 2050.
Sea surface temperature rise	The average global sea surface temperature has increased about 1.5°F since 1901, an average rate of 0.13°F per decade. The average global SST has been consistently higher during the past three decades than at any other time since reliable records began in 1880.[141]	During the near term (2021–2040), a 1.5°C increase in global surface temperature, relative to 1850–1900, is very likely to occur given the current rate of increase in GHG emissions.
Increased frequency of storms	Increased storms from 1999 onwards, with annual fluctuations. More storms during El Niña, fewer El Niño.	There will be an increasing occurrence of some extreme events unprecedented in the observational record with additional global warming, even at 1.5°C of global warming. The proportion of intense tropical cyclones (categories 4-5) and peak wind speeds of the most intense tropical cyclones are projected to increase at the global scale with increasing global warming.
Ocean acidification	Since 2011, GHG concentrations have continued to increase in the atmosphere, reaching annual averages of 410 ppm for carbon dioxide (CO2),	Upper ocean stratification, ocean acidification and ocean deoxygenation will continue to increase in the 21st

[139] Chart on sea level rise can be found via the following link: https://climateknowledgeportal.worldbank.org/country/belize/impacts-sea-level-rise

[140] Source: Simpson, M. C. et al. (2021)

[141] Source: NEEF (2021)

	1866 ppb for methane (CH4), and 332 ppb for nitrous oxide (N2O) in 2019. Land and ocean have taken up a near-constant proportion (globally about 56% per year) of CO2 emissions from human activities over the past six decades.[142]	century, at rates dependent on future emissions.
Changes in precipitation	The portion of the global land experiencing detectable increases or decreases in seasonal mean precipitation is projected to increase. It is very likely that rainfall variability related to the El Niño–Southern Oscillation is projected to be amplified by the second half of the 21st century.[143]	It is very likely that heavy precipitation events will intensify and become more frequent in most regions with additional global warming. At the global scale, extreme daily precipitation events are projected to intensify by about 7% for each 1°C of global warming.
Air temperature	Each of the last four decades has been successively warmer than any decade that preceded it since 1850. Global surface temperature in the first two decades of the 21st century (2001-2020) was 0.99 [0.84-1.10] °C higher than 1850-1900.	Global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO2 and other greenhouse gas emissions occur in the coming decades.[144]

Ecosystem Impacts - Climate change factors were assessed based on their potential impact on ecosystems and species within the SCMR. Impacts were given a rating of ***Uncertain*** if there was no clear indication of a positive or negative impact of a climate change factor on an ecosystem or on a species. Where negative impacts are likely to occur due to climate change, a rating of ***Negative*** was used; where positive impacts are likely to occur due to climate change, a rating of ***Positive*** was used.

Table 34: Ecosystem Impacts from Climate Change

Impacts	Coral reefs	Seagrass	Littoral forest	Commercial/ recreational species	Sea turtles	Sharks
Sea level rise	Uncertain	Negative	Negative	Uncertain	Negative	Uncertain
Sea surface temperature rise	Negative	Negative	Negative	Negative	Uncertain	Uncertain
Increased frequency of storms	Negative	Negative	Negative	Negative	Negative	Uncertain

[142] Source: IPCC (2021)
[143] Source: Ibid.
[144] Source: Ibid.

Ocean acidification	Negative	Negative	Negative	Negative	Negative	Negative
Changes in precipitation	Uncertain	Uncertain	Negative	Uncertain	Uncertain	Uncertain
Air temperature	Uncertain	Uncertain	Negative	Uncertain	Uncertain	Uncertain

Climate change also threatens the supply of key ecosystem services that Belize and its population rely on for food security and income. Climate change impacts and the associated sectors are presented below.

Table 35: Climate Change and Key Sectors[145]

Ecosystem service/ sector	Climate change impacts
Higher temperatures	• Higher temperatures are likely to negatively impact livestock and animal protein production and result in increased incidence of heat stress of livestock by affecting nutrient cycles, reproductive cycles, and facilitating the rise and spread of parasites and other harmful pathogens. • Higher temperatures increase water loss and reduce production, affecting crop yields. • Extreme temperatures will increase coral bleaching and affect fish habitats and populations which will lead to ultimate destruction of spawning and feeding areas for many fish species. • Increasing temperatures lead to increased evaporation which threatens surface water reserves.
Sea level rise	• Sea level rise will affect crop production and availability of arable lands. • Saline intrusion from sea level rise will reduce freshwater availability and most crops are not tolerant to saline conditions. • Sea level rise is likely to damage many resort properties across the region.
Inadequate rainfall/ droughts	• Inadequate rainfall and longer drought conditions will affect the production of forage and quality of feed needed to support livestock. • More heavy rainfall and flooding will increase crop losses. Heavy rainfall events and flooding often causes soil erosion and in other cases waterlogged fields. • Inadequate rainfall and longer drought conditions will affect water availability which can adversely impact tourism related services.
Hurricanes/ tropical storms	• More frequent and severe hurricanes/storms will cause significant crop loss. • More frequent and severe hurricanes may continue to destroy hotels and affect arrivals across the region. • More intense hurricanes and storm events may damage energy infrastructure.

[145] Source: The State of the Caribbean Climate (2020). https://www.caribank.org/sites/default/files/publication-resources/The%20State%20of%20the%20Caribbean%20Climate%20Report.pdf

3.2.3 Threat Reduction Strategies

Based on the results of the threat assessment, the following general strategies have been identified to be able to mitigate threats to the SCMR.

Table 36: General Management Strategies[146]

Strategies	Seagrass	Commercial Species	Littoral Forest	Sandy Beaches	Coral reef	SPAG
Reduce local anthropogenic threats through community engagement and awareness programs, and effective enforcement						
Work closely with national and international partners to monitor climate change effects						
Ensure SCMR has the human resources, equipment and training for effective surveillance and enforcement						
Engage caye owners developers / residents within SCMR and increase awareness of caye development impacts on the MPA values						
Collaborative enforcement against transboundary incursions both within and outside the MPA – and strengthen Special Enforcement Team						
Continue liaising with Port Authority to ensure that all shipping vessels are appropriately equipped and that the lighthouse is in proper working order						
Develop contingency plan for boat groundings, and source equipment for dealing with an event						

[146] Source: SCMR Management Plan (2011)

Implement policies and regulations for all tour boats – including requirement for local guides, boat captains, tourism regulations, use of mooring buoys, removal of garbage, zone regulations, Fisheries regulations, Mangrove regulations						

4.0 Management Planning

4.1 Management and Organizational Background

A distinctive feature of Belize's protected area policy is the co-management framework that allows for shared management responsibilities between the Belize Fisheries Department (for marine PAs) and the Belize Forest Department (for terrestrial PAs) with conservation NGOs. The co-management agreement is critically important for ensuring positive biodiversity outcomes, given that Belize's fiscal position may not always allow for consistent resource mobilization and support for conservation.

Short history on co-management in Belize

The first ad hoc "co-management agreement" dates back to 1984, when the Belize Audubon Society was mandated by the Government of Belize (GOB) to act as caretaker of the first protected areas that were declared under the National Parks System Act of 1981.[147]

Co-management agreements have come a long way since then. Today, co-management agreements are legally-binding agreements between protected areas management agencies and the GOB, that clearly stipulate roles and responsibilities of the parties to the agreements, as well as provisions for renewal of, withdrawal from, and termination of and amendments to the agreement, among other special provisions. This trend toward formal government-civil society partnerships in protected areas management has ensured that Belize's biodiversity remains protected.

The Sapodilla Cayes Marine Reserve was officially declared through Statutory Instrument 117 of 1996 under the Fisheries Act. The Marine Reserve falls under the IUCN Category IV (a habitat management area managed mainly for conservation through management intervention), with the Fisheries Department as the Authority with the legislated responsibility for management of the protected area. The Belize Fisheries Department shared management responsibilities with the Southern Environmental Association (SEA) between 2011 and 2016. The Belize Fisheries Department is in a transitional phase having been reassigned under the Ministry of the Blue Economy and Civil Aviation, having previously been a department under the Ministry of

[147] Source: Young, C. A. and Dr. Robert Horwich. n.d. History of Protected Area Designation, Co-management and Community Participation in Belize. Accessed at: https://www.turneffeatoll.org

Sustainable Development.[148] Departmental strategy is currently being reviewed and revised to align with objectives of the Ministry of the Blue Economy.

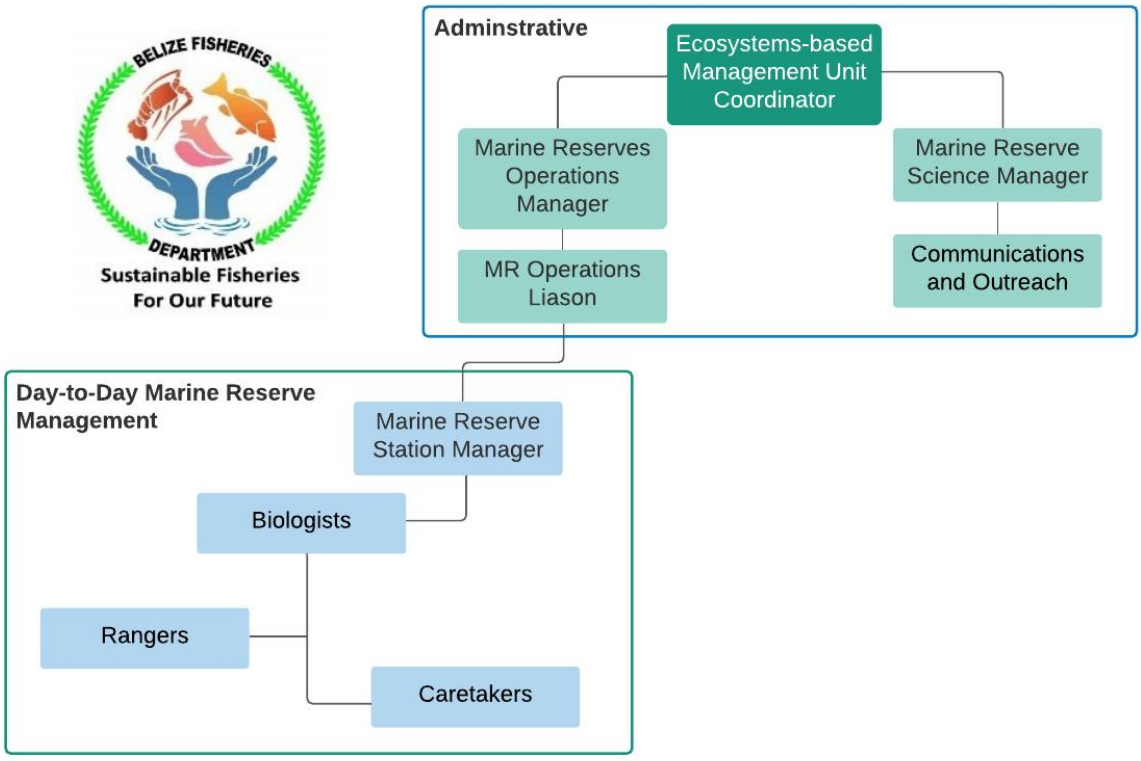
Belize Fisheries Department: Vision

To provide the country and the people of Belize with the best possible management of aquatic and fisheries resources with a view to optimize the present and future benefits through efficient and sustainable management

The Belize Fisheries Department has a defined administrative structure and a day-to-day marine reserve management structure (see Figure 33). However, the Marine Reserve finds itself in a transition phase, and roles and responsibilities will be clearly defined between the Fisheries Department and the potential co-manager through a co-management agreement. Currently, on-site management is under the Reserve Manager, who is supported by two rangers and a marine biologist who are paid by the BFD. A co-management agreement would allow the potential co-manager to assume most of the management, monitoring, and enforcement duties within the SCMR. In addition, the potential co-manager would be primarily responsible for funding of management activities, with peripheral financial and technical support provided by the BFD, as needed.[149]

Figure 33: Ecosystem-Based Management Unit (EMU)

[148] Note: Formerly the Ministry of Agriculture, Forestry, Fisheries, and Sustainable Development
[149] The BFD is currently transitioning to the Ministry of the Blue Economy.



4.1.1 Organizational Capacity Assessment

An Organizational Capacity Assessment was conducted for the Belize Fisheries Department to measure current capabilities and to provide evidence based qualitative and quantitative data on specific areas that could be improved. Organizational capacity was scored between 1 and 4 to assess organizational performance across the following key areas:

- Governance
- Human resources
- Organizational management
- Program management
- Financial management

Organizational capacity for the BFD was rated as FAIR.

Table 38: OCA Results

Indicator	BFD	
Governance	63.6%	Moderate
Human Resources	64.7%	Moderate
Organizational Management	No Data	No Data
Program Management	42.1%	Fair

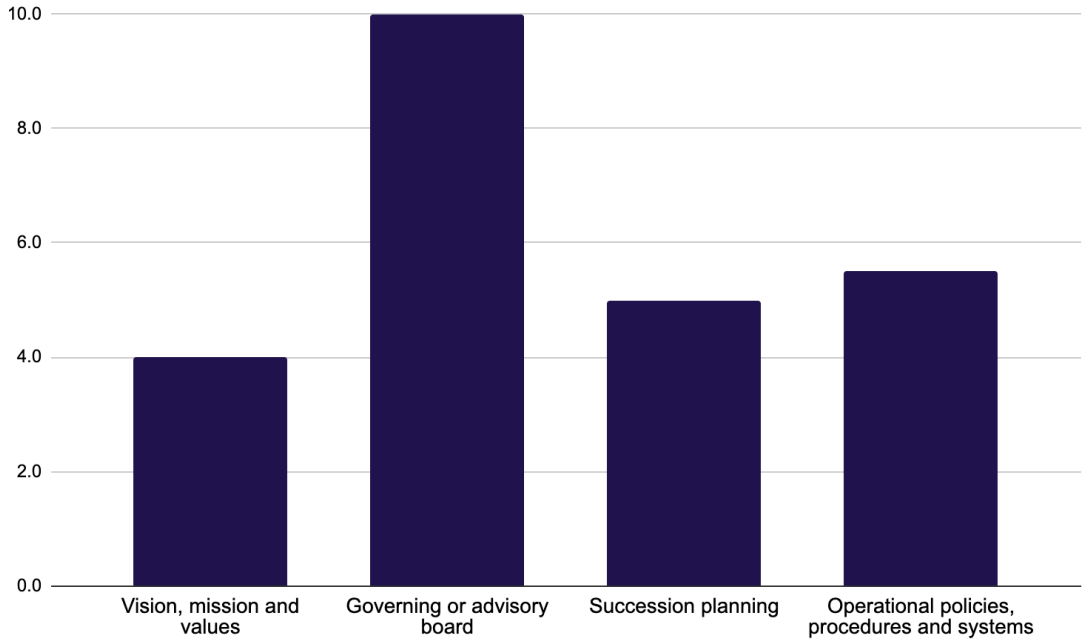
Financial Management	No Data	No Data
Overall	**34.1%**	**Fair**

Governance - The objective of the Governance Section is to assess the clarity of the organization's motivation, purpose, and stability by reviewing its guiding principles, structure, and oversight mechanisms. Scores for each sub-indicator in the Governance category are provided below. Results reveal the following:

- **Vision** - The vision and/or mission is not a clearly stated description of what the agency aspires to achieve or become.[150]
- **Governing/ advisory board** - The BFD have clear and well established terms of reference for board selection to ensure strong diverse boards composed of members with relevant experience. Regular and well-documented board meetings are held and the boards exercise consistent and careful oversight of the organization according to its functions defined in the terms of reference.
- **Succession planning** - Results show that the BFD is currently more vulnerable to absences of senior management and/ or shifts in leadership.
- **Operational policies -** The BFD also has well documented operating procedures and policies that are shared with staff and generally adhere to national or donor regulations.

Figure 34: Governance Performance

[150] Note: The Belize Fisheries Department was formerly housed within the Ministry of Agriculture, Fisheries, Forestry, the Environment and Sustainable Development and Immigration Services and Refugees. As of 2020, it is now housed with the Ministry of the Blue Economy and Civil Aviation. The Ministry has yet to publish a vision or mission for its portfolio.

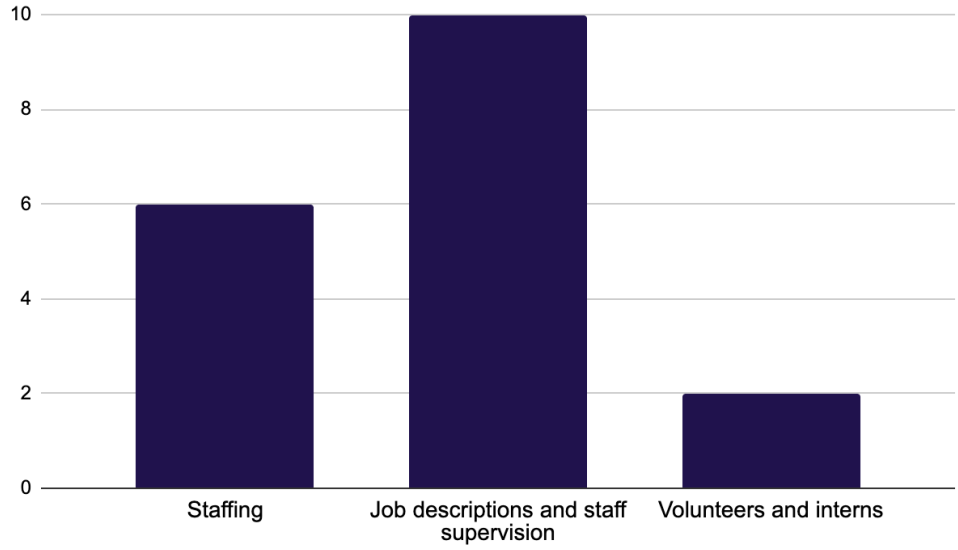


Human Resources - The objective of this indicator is to assess the organization's ability to maintain a satisfied and skilled workforce, to manage operations and staff time and to implement quality programs. Results reveal the following:

- **Staffing** - The BFD scores similarly well, indicating that key positions are filled and a staffing plan exists and is adhered to.
- **Recruitment** - Results reveal that the BFD develop and post job descriptions that are compliant with policy for recruitment. Both organizations have clear and established processes for assessing staff performance that include setting objectives, listing responsibilities/ tasks, assessing performance on past activities, supervision and professional development.
- **Volunteers and interns** - There is no clear policy for recruiting or selecting volunteers or interns by the BFD.[151]

[151] Note: Validation sessions held with the BFD team reveal that recruitment of volunteers poses legal liability concerns.

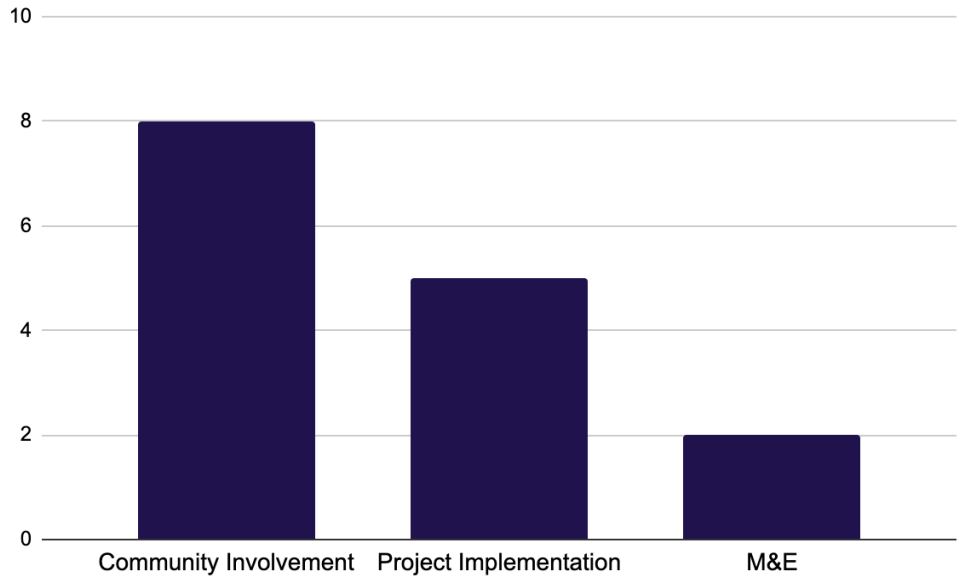
Figure 35: Human Resources Performance



Program Management - Effective program management requires community involvement, transparent project implementation and monitoring and evaluation. Strengthening Involvement of the community in designing, monitoring, and implementing activities fosters buy-in and makes programs more relevant, effective, and sustainable especially when it comes to the management of protected areas. Results reveal the following:

- The BFD orients communities and leaders on programs and actively engage them in related activities. Communities are also included, when possible, in planning and decision making.
- Both organizations typically have clear work plans and program budgets. However, for the BFD financial and human resources are often limited which impacts program implementation.
- The BFD has a well-defined M&E plan which includes process and outcome indicators and a strategy for reporting on progress against targets. The BFD lacks a well-defined M&E plan that clearly outlines process and outcome indicators.

Figure 36: Monitoring and Evaluation



4.2 Review of Previous Management

Site management of the SCMR is currently the sole responsibility of the Belize Fisheries Department since the expiration of the previous co-management agreement with SEA in 2016. Management effectiveness was assessed using the IUCN Framework for Assessing Management Effectiveness in Protected Areas.[152] Under the National Protected Areas Policy and System Plan, management effectiveness is evaluated through the Monitoring Package for Assessing Management Effectiveness of Protected Areas, based on 64 indicators, and divided between seven indicator categories:[153]

1. Resource Information
2. Resource Administration, Management and Protection
3. Participation, Education and Socio-economic Benefits
4. Management Planning
5. Governance
6. Human Resources
7. Financial and Capital Management

The management effectiveness of Sapodilla Cayes Marine Reserve as assessed in mid-2009 was rated as MODERATE, with an overall Management Effectiveness of score of 2.60 out of 4.00

[152] Source: Hockings, M., Stolton, S., Leverington, F., Dudley, N. and Courrau, J. (2006). Evaluating Effectiveness: A framework for assessing management effectiveness of protected areas. 2nd edition. IUCN, Gland, Switzerland and Cambridge, UK. xiv + 105 pp

[153] Source: Young et. al. (2005)

(65.1%).[154] As of November 2021, management effectiveness of the SCMR is rated as FAIR (48.9%).[155]

Table39: IUCN Management Effectiveness Results

Indicator	BFD	
Governance	54.20%	Moderate
Human Resources	50.00%	Fair
Participation, education and socioeconomic benefits	50.00%	Fair
Resource administration	62.50%	Moderate
Resource information	65.90%	Moderate
Financial and capital management	No Data	No Data
Management Planning	60.00%	Moderate
Overall	**48.90%**	**Fair**

Governance - Governance structure addresses the flow of power and authority within an organization. Good governance requires that authority, responsibility, and accountability be clearly defined for all organizational partners with a role in managing the protected area. The sub-indicators of this category assess the extent to which:

- Authority, responsibility, and accountability are established for managing the protected area
- Essential governance structures and processes well-designed and implemented
- Relations and communication are effective within all partners

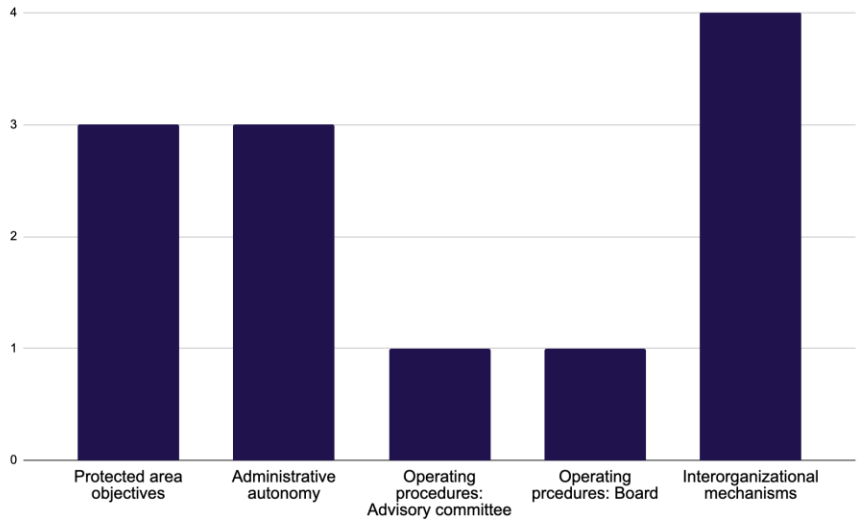
The BFD achieved a score of MODERATE (54.2%) in the governance category which is lower than the national average of 2.75 (68.8%) recorded in 2009. Results are as follows:

- The BFD scored GOOD or VERY GOOD in the sub-indicators of PA objectives, administrative autonomy, and interorganizational mechanisms. In general, the results indicate that the BFD does have clear objectives for the SCMR and enjoys administrative autonomy needed to revise goals and targets and pursue fulfillment.

[154] In 2009 management was conducted through a co-management agreement between the Fisheries Department and the Southern Environmental Association (SEA). It is the consultant's understanding that the co-management agreement was not renewed beyond 2016 due to a lack of secured funding for site management on the part of the SEA. Source: Consultations with the Belize Fisheries Department.
[155] Note: A list of all 64 sub-indicators can be found in Annex C.

- The BFD scored POOR in the area of operating procedures. The results indicate that the BFD has not established operating procedures for its advisory committee or board of directors which could enhance oversight and ensure long-term implementation success.

Figure 37: Governance



Human Resources -Human resources are essential for effective PA management, both in terms of technical capacity and availability. The indicators in this category assess the extent to which:

- Necessary workers are recruited and available.
- Necessary workers are adequately educated and trained for their jobs.
- Necessary workers have good morale to ensure high productivity
- Volunteers are recruited and managed.

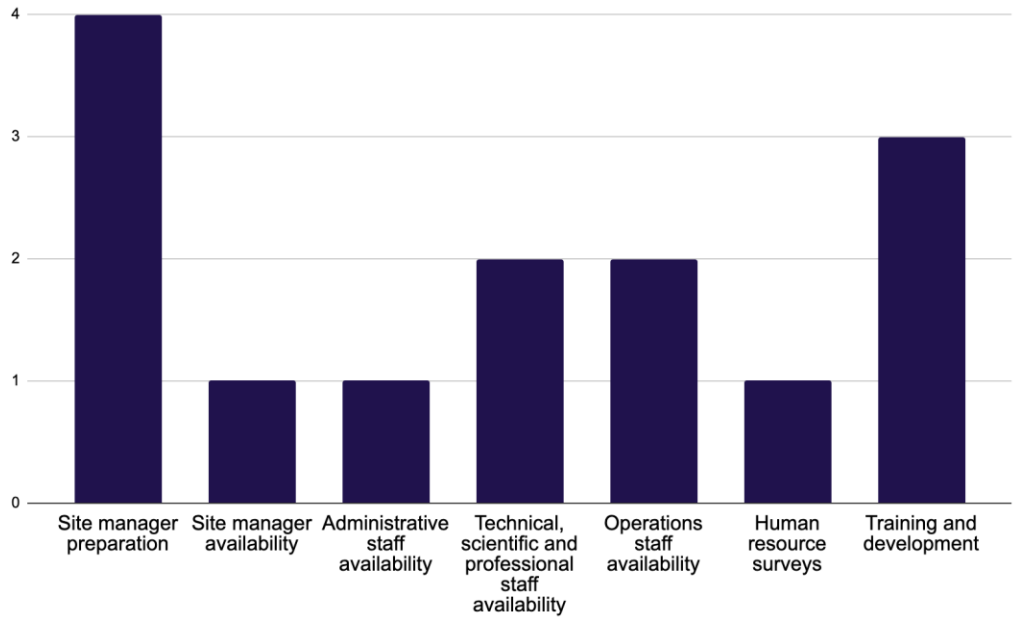
In the category of human resources, the BFD achieved a score of FAIR (50%) which is lower than the national average of MODERATE recorded in 2009. Results are as follows:

- The BFD scored VERY GOOD in the area of site manager preparation and GOOD indicating that the site manager has more than 9 years of combined relevant post-secondary education and/or experience directly related to his management responsibilities. The BFD scored in the area of training and development.
- In the area of training and development, the BFD scored GOOD, indicating that Training and development activities are being implemented but that the activities are small in scale relative to need and under-funded.
- The BFD scored FAIR in the areas of operations and technical staff availability, indicating that between 25% and 50% of the necessary operations and technical workers are available to carry out assigned tasks necessary for minimum required level of management at the site.
- The BFD scored POOR in the areas of administrative and site manager availability. These results indicate that the percentage of time the site manager is available and dedicated to

management of the protected area is less than 25%. A primary reason for this result is due to the remoteness of the SCMR and the logistical challenges posed by maintaining a full-time presence on Hunting Caye. The results also indicate that less than 25% of the necessary administrative workers are available for basic administration of the area.

- The BFD scored POOR in the area of human resource survey, indicating that human resource surveys have been conducted to assess staff well-being and potential bottlenecks.

Figure 38: Human Resources



Participation, Education and Socio-economic Benefits -This indicator set deals with human issues associated with the protected area. Participation includes communications as well as involvement in planning and management. Education includes communications, environmental education, awareness and interpretation activities, and the provision of public information. Socio-economic benefits include opportunities for local communities and stakeholders to participate in any employment or economic activities that might be sustainable within the protected area. These might include, for example, local involvement in enforcement or interpretation work.

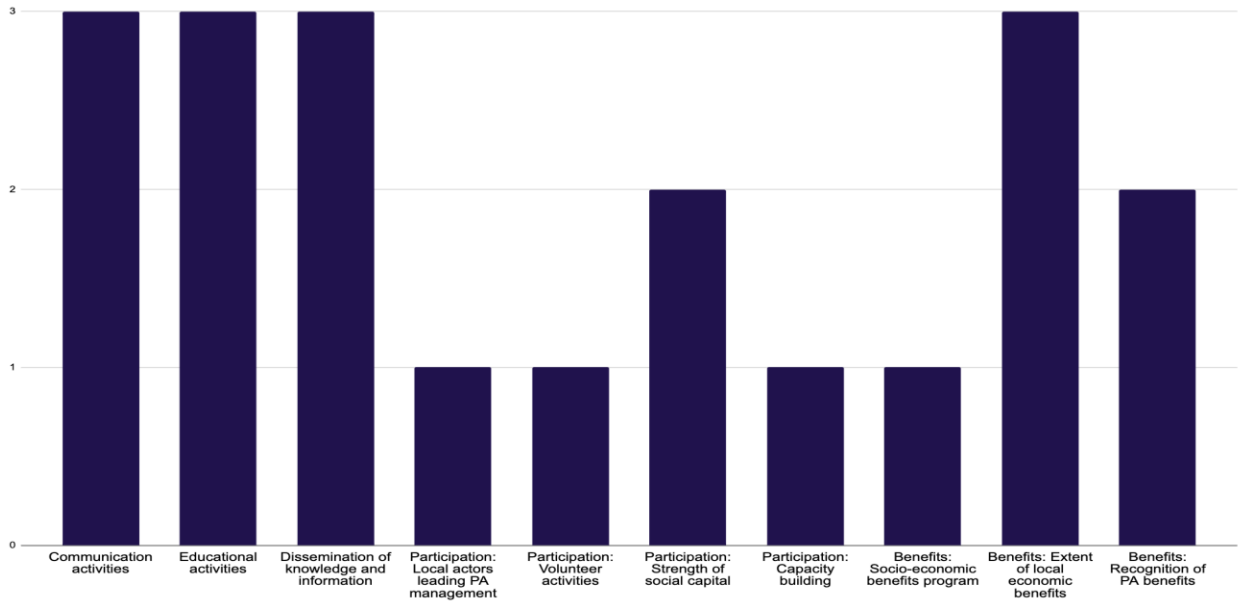
One of the products of participation and education is building of social capital and capacity. Social capital is the capacity of a community to mobilize, organize, and participate in community functions, such as the management of a local protected area. Functional capacity, in this indicator, means the possession of leadership, organizational, and communication knowledge, skills, and technology necessary for becoming involved in organization processes, management decision-making, and implementation. Goals These indicators assess the extent to which:

- Local communities and stakeholders are fully involved in the management of the protected area.
- Local communities, stakeholders, and the public appreciate the environmental and cultural values of the protected area and the national contribution they make.
- Local communities benefit from the presence of the protected area

In the category of participation, education, and socio-economic benefits, the BFD scored FAIR (50%) which is below the national average of 53.4% recorded in 2009. Results are as follows:

- The BFD scored GOOD in the areas of communication and educational activity and the dissemination of knowledge and information on the SCMR. These results indicate that communications and educational activities are being implemented but are generally small in scale relative to need, under-funded, and not being evaluated.
- The BFD also scored GOOD in the area of Benefits: Extent of local economic benefits, indicating that it regularly collects data on the socio-economic benefits that the SCMR provides but that current activities are still not sufficient for effective management. The accurate assessment of the economic benefits within the SCMR is critical to the successful implementation of fisheries regulations and natural resource management.
- The BFD scored FAIR in the areas of Strength of Social Capital and Recognition of PA Benefits. These results indicate that between 25% and 50% of stakeholders recognize the goods and services the protected area provides but that few local stakeholders have the functional capacity that would enable them to participate effectively in the management of the protected area.
- The BFD scored POOR in the areas of Local actors leading PA management, volunteer activities, capacity building, and socio-economic benefits programs. These results indicate that local actors are informed and consulted about decisions taken by protected area management but do not lead the management process; no volunteer strategies or activities exist; no stakeholder capacity building plan for the protected area exists; and no socio-economic benefits strategy or initiatives exist for the SCMR.

Figure 39: Participation, Education and Socio-economic Benefits



Resource Management - This category covers a broad range of issues, including administration of land tenures and uses; compliance, surveillance and enforcement; and visitor management. Visitor/user management includes actions taken to manage and regulate the activities of legal uses within the protected area. These can include tourists, traditional users, licensed resource users, and others. Visitor/user management may involve construction and maintenance of capital, control of guiding activities, accommodation, and concessions.

These indicators assess the extent to which:

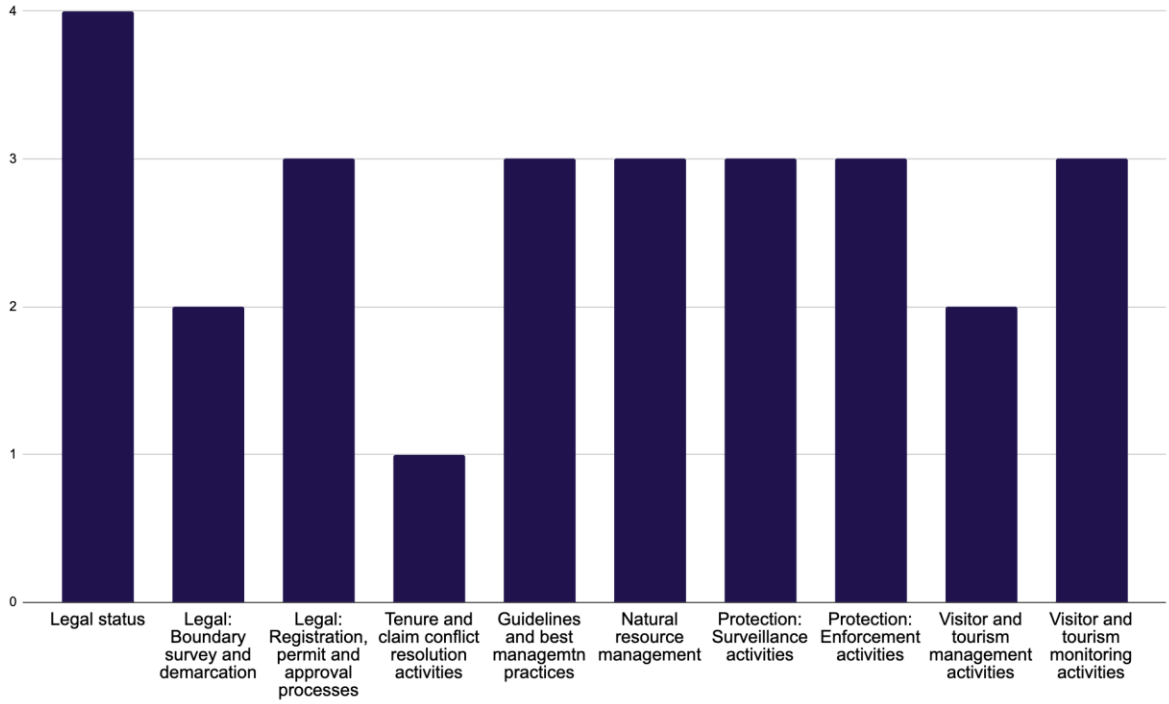
- The protected area is legally established and demarcated.
- Processes exist to address and manage legal uses of the site, outside influences, conflicting rights and uses, and illegal and prohibited activities, and visitors.

In this category, the SCMR scored MODERATE (62.5%) which is below the national score of 68.5% recorded in 2009. Results are as follows:

- The SCMR scored VERY GOOD in the area of legal status reflecting that the site has been designated by strong legislation.
- The SCMR scored FAIR in the area of boundary and survey demarcation, revealing that even though the reserve's boundaries have been legally defined, less than 50% of the planned surveys and demarcation has been completed.
- The SCMR scored MODERATE in the area of permit and approval processes reflecting the strong presence of the BFD in regulating commercial and other activities within the reserve
- In terms of best management practices, natural resource management, surveillance and enforcement activities, the SCMR scored MODERATE, indicating that management, surveillance, and enforcement activities are being implemented but they are generally not sufficient for effective management due to human and financial resources constraints.

- The SCMR scores POOR in the area of tenure and conflict resolution activities, indicating that no strategies or activities exist for resolving conflicts with local stakeholders or other parties.

Figure 40: Resource Management



Management Planning - This category covers implementation success and monitoring and evaluation of programs. It is important for the strategic agenda of a site to be reviewed regularly and revised as needed, while also incorporating stakeholder input and feedback.

These indicators assess the extent to which:

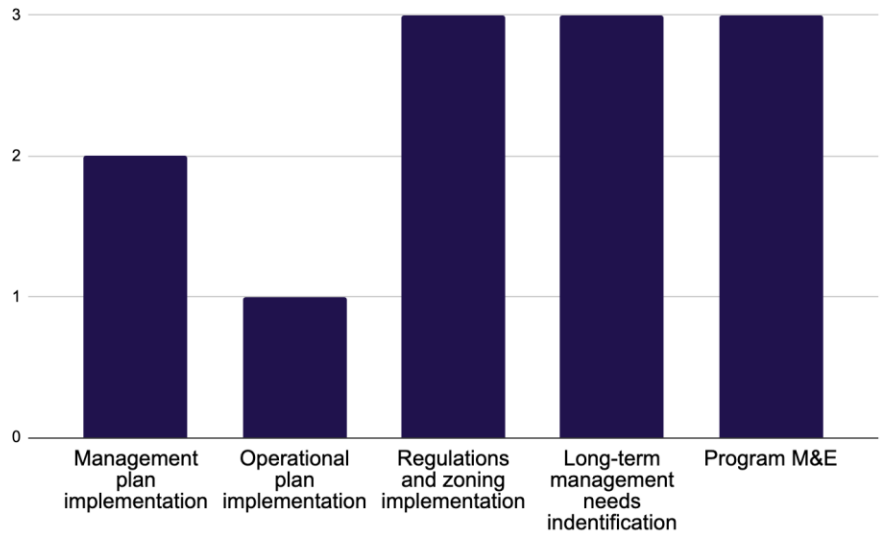
- Effective planning processes are in place
- Management plans, operational plans, site design plans, regulations and zoning, and guidelines and best management practices are being implemented
- Management resource needs are identified
- Monitoring and evaluation are conducted

The SCMR scored MODERATE (60%) in management planning which is above the national score of 55.1% in 2009. Results are as follows:

- The BFD scored GOOD in the areas of regulations and zoning implementation, long-term management needs identification, and program monitoring and evaluation. These results generally indicate that well-designed regulations and zoning have been established but are not being fully implemented and are not fully sufficient for site management. In addition, plans do identify management resource needs based on management and operational plans and/or careful needs analyses but the identification is not up-to-date and/or comprehensive enough. Currently, these plans are not sufficient to guide management without some revisions.

- In terms of management plan implementation, the SCMR scored MODERATE, reflecting that the previous management plan expired in 2016 with no immediate action taken to revise and develop a new plan quickly.
- In terms of operational plan implementation, the SCMR scored POOR, indicating that no up-to-date operational plan exists. An operational plan is typically a detail-oriented plan that clearly defines how teams or departments contribute to reaching organizational goals.

Figure 41 Management Planning



Resource Information - This category covers data collection, analysis and reporting and the activities that support informed decision making for site management. These indicators assess the extent to which:

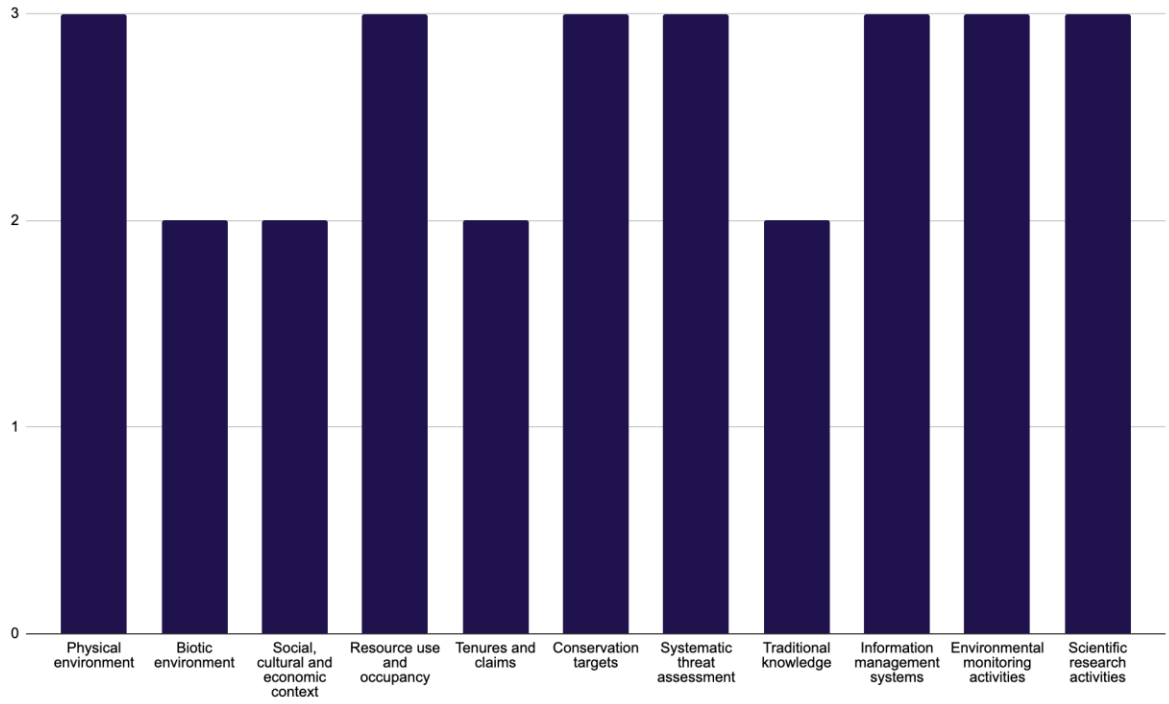
- Programs are in place to gather, store, analyze, and monitor information important to managing the protected area.
- Information gathered and analyzed are sufficient for management.
- Conservation information has been gathered to identify important conservation targets and threats.

In terms of resource information, the BFD scored MODERATE (65.9%) which is above the national score of 53.5% recorded in 2009. Results are as follows:

- In terms of inventory management, the BFD scores GOOD in the areas of physical environment and resource use and occupancy. These scores indicate that most required inventories on the physical environment and resource uses have been completed but there are still gaps in information documentation.
- The BFD scored FAIR in the areas of biotic environment, socio-economic context, and tenures and claims. These results indicate that only some required inventories have been completed on the biotic environment but this information is limited in scope and quality

due to resource constraints. Likewise, only some of the required inventories have been completed on the social, cultural, and economic context of the SCMR. In addition, tenure and claim information is out-of-date and poorly documented.[156]

Figure 42: Resource Information



4.3 Management Goals

The purpose of a Marine Reserve is to: “afford special protection to the aquatic flora and fauna and to protect and preserve the natural breeding grounds and habitats of aquatic life”.[157]

The following goal was identified for the management of the Sapodilla Cayes:[158] To conserve and protect biodiversity of the Sapodilla Cayes Marine Reserve for the sustainable use of present and future generations."

This is to be achieved through the following six objectives:

1. To develop sustainable fisheries in the SCMR through effective surveillance and enforcement of zoning, and prevention of transboundary fishing incursions
2. To identify and protect resilient reefs, with effective, ongoing monitoring of biodiversity to inform management decisions

[156] Note: Since the initial assessment, the BFD has conducted land tenure research within the SCMR to establish fees simple and leasehold interests of the cayes within the reserve.
[157] Source: SCMR Management Plan 2011-2016
[158] Source: Ibid.

3. To ensure sustainable tourism use of the Sapodilla Cayes Marine Reserve though developing and implementing a 'limits of acceptable change' programme, with established carrying capacities
4. To address uses and activities outside Sapodilla Cayes Marine Reserve that threaten conservation and protection of biodiversity within the marine protected area, through transboundary collaboration
5. To ensure stakeholders are informed and supportive through regional education and outreach strategies
6. To ensure proper administration and implementation of the Sapodilla Cayes Marine Reserve, with full stakeholder input into decision making

4.4 SWOT Analysis

Using the results from the internal and external analyses, a SWOT analysis for the BFD was conducted.

Figure 43: SWOT for SCMR management

Strengths	Weaknesses
• Mature department with extensive experience in natural resource management and conservation	• Limited funding (budget allocations) • Limited human resources • Limited stakeholder communication
Opportunities	**Threats**
• The SCMR is a key component of the BBRS - World Heritage Site. and attractive for funding • Increased focus on conservation and protection through TNC-GOB Debt for Nature Swap (Blue Bond) agreement • IUCN Green List Certification • Transboundary collaboration with FUNDAECO • Deepening collaboration with national and regional partners to help fill human resources gaps • Ensure that stakeholder engagement is mainstream into all projects/programmes.	• Significant dependency of local people on reserve's resources • Presence of illegal users - illegal fishing • Coastal development that leads to marine pollution • Climate Change • Fishing Pressure • Poor Visitor Practices • Unregulated tourism • Agricultural Runoff • Caye Development • Low stakeholder buy-in

- Diversify income streams through various resource mobilization strategies (develop a strategy if one does not exist) and collaboration with national and regional partners.

4.5 Management Strategies

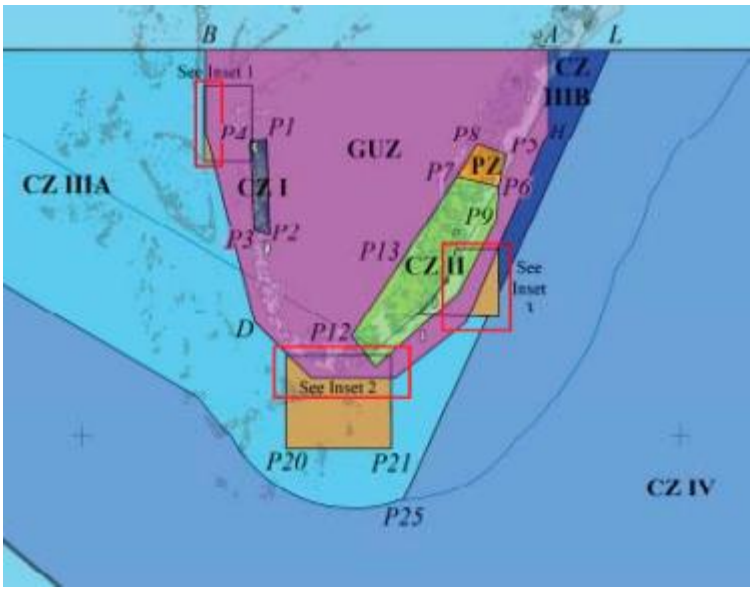
3.5.1 Management Zones

The Sapodilla Cayes Marine Reserve encompasses a total area of 321,632 acres (130,160 ha), though there is limited boundary demarcation in place at the moment. The area is divided into seven (7) zones designed to support commercial and conservation activities:

- General Use Zone (32,482 acres)
- Conservation Zone I (651 acres)
- Conservation Zone II (4,913 acres)
- Conservation Zone IIIA (51,254.6 acres)
- Conservation Zone IIIB (2,821.9 acres)
- Conservation Zone IV (228,953 acres)
- Preservation Zone (548 acres)

Three (3) Spawning Aggregations Sites (SPAGs) are contained within the reserve and partially overlap the General Use Zone, Conservation Zone IIIA, Conservation Zone II, Conservation Zone IIIB, and Conservation Zone IV.

Figure 44: Spawning Aggregation Sites



General Use Zone - Comprises 10% of the entire reserve protected area. The area is designated for recreational use, research and fishing in accordance with the rules and regulations of the Marine Reserve. Fishing is only permitted in this Zone by licensed fishermen, with restrictions on gear used, including a ban on gillnets and spear fishing. Sport fishing is permitted, (excluding spear fishing) - best practice guidelines promote catch and release.

Conservation Zone I - Conservation Zone I lies on the western reef of the Marine Reserve, running northwards from Frank's Caye, and covers approximately 651 acres (0.2%) of the Marine Reserve. Within this zone, marine life is fully protected, with only non-extractive recreational activities permitted and no commercial fishing allowed. Sport fishing is only allowed when 'catch and release'. All boats using this zone should be secured using officially designated mooring buoys to prevent anchor damage to the seabed – except in emergency situations, or with prior written permission from the Protected Area Manager and Fisheries Department.

Conservation Zone II - The Conservation Zone covers approximately 4,913 acres (1.5%) of the Marine Reserve, running along the east-facing reef, and associated cayes (excluding the Preservation Zone, and the northernmost shoal around Tom Owen's Caye). Within this zone, marine life is fully protected, with only non-extractive recreational activities permitted and no commercial fishing allowed. 'Catch and release' fishing is allowed as well as subsistence, with restricted gear types for traditional fishermen only.

Conservation Zone IIIA/ IIIB - Covers approximately 16% of the total reserve. Rules are the same as Conservation Zone II but commercial fishing is allowed.

Conservation Zone IV - Covers approximately 71.2% of the total reserve. Rules are the same as Conservation Zones I, II, IIIA and IIIB except that recreational activities, sports fishing, recreational fishing, fishing for the purposes of a tournament or competition are permitted.

Preservation Zone - The Preservation Zone covers approximately 548 acres (0.2%) of the Marine Reserve, and abuts the northern end of Conservation II. No access or activities are allowed in this zone.

3.5.2 Limits of Acceptable Change

There are currently no carrying capacities set for tourism activities within Sapodilla Cayes Marine Reserve. Feasibility and impact studies have not been conducted in the context of the SCMR.

3.5.3 Risk Management

Organizational Risks - A risk-based approach to management requires the identification of risks to management and operational continuity. Once risks are identified, they are classified according to their likelihood and impacts. Risks are provided below. Key organizational risks are identified below. Impact and likelihood are measured on a scale from one (1) to three (3) indicating "Low" and "High", respectively. Risk appetite speaks to the R level of risk that the BFD is prepared to accept in pursuit of management objectives, before action is deemed necessary to reduce the risk. Risk appetite is also measured on a 1-3 scale with a score of 1 (Low) indicating that management is committed to acting quickly and decisively to avoid the materialization of that particular risk.

Table 40: Organizational Risks

Risk	Description	Impact	Likelihood	Appetite
Business risk	Arises from an inability to generate sufficient revenue and grants to cover operational and programmatic expenses	HIGH	MEDIUM	LOW
Financial risk	Risk that financial reporting does not provide an accurate assessment of financial position, income expenses and cash flows - this could result in management making improper strategic and operational decisions and could lead to distrust from key stakeholders	HIGH	MEDIUM	LOW
Strategic risk	Arises when the potential co-manager or BFD does not operate according to its mission and values.	HIGH	LOW	LOW
Compliance risk	Arises from the potential co-manager or BFD's failure to act in accordance with laws and regulations, internal policies or prescribed best practices and can result, inter alia, in legal penalties, and financial and material losses	HIGH	LOW	LOW
Operational risk	Arises from ineffective or failed internal processes, people, systems, or external events that can disrupt the operations.	HIGH	LOW	LOW
Reputational risk	Arises directly, as the result of the actions of the potential co-manager or BFD and, Indirectly, due to the actions of an employee or employees. Threatens the good name or standing of the potential co-manager or BFD.	HIGH	MEDIUM	LOW

Mitigation/ adaptation controls for organizational risks are provided below.

Table 41: Organizational Risk Controls

Risk	Risk owner	Controls
Business risk	The potential co-manager Executive Director	• The potential co-manager will recruit grant proposal writing expert to enhance fundraising potential and efficiency
Financial risk	The potential co-manager Accountant	• The potential co-manager will develop financial policy to dictate accounting reporting standards
Strategic risk	The potential co-manager's Executive	• The potential co-manager has developed a strategic plan for the period 2022-2026

	Director The potential co-manager Board of Directors	• The potential co-manager board has diverse membership and holds monthly board meetings
Compliance risk	The potential co-manager Executive Director	• External audits of the potential co-manager conducted every year
Operational risk	The potential co-manager Operations Manager	• The potential co-manager has key internal policies and procedures in place for Human Resources, Financial Management and Risk Management.[159]
Reputational risk	The potential co-manager Executive Director	• Management maintains an updated list of key stakeholders and regularly meets with stakeholders to discuss management decisions and developments • Management actively promotes sound environmental management and social responsibility programs which help create a reputation safeguards to reduce risk. • Management fosters a work culture that promotes ethical practices, encourages individual integrity, and fulfills social responsibility. • Management assures equitable treatment and development of all employees.

Ecosystem Risks - Key ecosystem risks are identified below. Impact and likelihood are measured on a scale from one (1) to three (3) indicating "Low" and "High", respectively. Risk appetite speaks to the R level of risk that the potential co-manager and the BFD are prepared to accept in pursuit of management objectives, before action is deemed necessary to reduce the risk. Risk appetite is also measured on a 1-3 scale with a score of 1 (Low) indicating that management are committed to acting quickly and decisively to mitigate risk.

Table 42: Ecosystem Risks

Risk	Impact	Likelihood	Appetite
Invasive species	HIGH	MEDIUM	LOW
Agricultural runoff	HIGH	MEDIUM	MEDIUM
Illegal fishing	HIGH	HIGH	LOW
Vessel groundings	HIGH	HIGH	LOW
Hazardous waste spills	HIGH	HIGH	LOW
Sea level rise	MEDIUM	MEDIUM	MEDIUM
Ocean acidification	HIGH	MEDIUM	LOW

[159] Note: Risk management framework is currently being revised to incorporate management of the SCMR.

Sargassum	HIGH	MEDIUM	LOW
Rising sea temperatures	HIGH	MEDIUM	LOW
Caye development	HIGH	LOW	MEDIUM
Visitor impacts (garbage, etc)	MEDIUM	MEDIUM	MEDIUM

Mitigation/ adaptation controls for ecosystem risks are provided below. The potential co-manager and the BFD, as co-managers of the SCMR, are risk owners and are charged with responding to and mitigating and adapting to ecosystem risks.

Table 43: Ecosystem Risk Controls

Risk	Controls
Invasive species	● Quarterly dive expeditions at SPAGs and key coral reef habitats ● Annual population counts of indicator species including, but not limited to:[160] ○ Angelfishes ○ Groupers/ Sea Basses ○ Grunts ○ Leatherjackets - (Triggerfishes & Filefishes) ○ Morays ○ Parrotfishes ○ Porcupine Fishes ○ Snappers ○ Surgeonfishes ○ Wrasses (Hogfishes)
Agricultural runoff	● The potential co-manager and BFD will prioritize the establishment of an advisory group with representation from agricultural sector to facilitate communication and coordinate mitigation and adaptation strategies for agricultural runoff ● The potential co-manager and the BFD will work closely with the Tri-National Alliance (TRIGOH) to facilitate communication and coordinate mitigation and adaptation strategies for agricultural runoff from Guatemala and Honduras (FUNDAECO is also a key partner)
Illegal fishing	● The potential co-manager and the BFD will prioritize the identification of fishing hotspots to inform patrols and surveillance ● The potential co-manager and the BFD will conduct weekly patrols within and outside reserve to enforce fishing laws and regulations through daily patrols ● The potential co-manager and BFD commit to increasing night patrols
Vessel groundings	● The potential co-manager and the BFD, in collaboration with the Coast Guard and the Port Authority, will prioritize the setting of marker buoys and signage to facilitate marine traffic and avoid accidental groundings

[160] Note: Atlantic and Gulf Rapid Reef Assessment (AGRRA) is conducted every two (2) years.

	● The potential co-manager and the BFD, in collaboration with the Coast Guard, will maintain presence on Hunting Caye to watch out for potential groundings ● On-site staff will have access to sat phones to reliably communicate with the Department of the Environment in the event of a grounding
Hazardous waste spills	● The potential co-manager and the BFD, in collaboration with the Coast Guard, will maintain presence on Hunting Caye to watch out for spills ● On-site staff will have access to sat phones to reliably communicate with the Department of the Environment in the event of a spill
Sea level rise	● The potential co-manager and the BFD will monitor sea level rise across key locations within the reserve
Ocean acidification	● The potential co-manager and the BFD will monitor sea pH levels across key locations within the reserve ● The potential co-manager and the BFD will maintain close communication with the Coastal Zone Management Authority Institute to facilitate water sampling and data collection
Sargassum	● The potential co-manager and the BFD will monitor sargassum levels within and outside the reserve ● The potential co-manager and the BFD will maintain close communication with the Coastal Zone Management Authority Institute to facilitate water sampling and data collection
Rising sea temperatures	● The potential co-manager and the BFD will monitor sea temperature levels across key locations within the reserve ● The potential co-manager and the BFD will maintain close communication with the Coastal Zone Management Authority Institute to facilitate water sampling and data collection
Caye development	● The potential co-manager and BFD will conduct a detailed land tenure assessment to identify all owners, lessors, and lessees within the SCMR ● The potential co-manager and BFD will closely monitor activity on cayes and maintain close communication with the Department of the Environment to facilitate reporting of potential environmental impact considerations
Visitor impacts (garbage, etc)	● The potential co-manager and BFD will prioritize the identification of visitor hotspots to inform the placement of signage to raise awareness of visitor impacts and to deter pollution ● The potential co-manager and BFD will closely monitor and patrol visitor hotspots in collaboration with the BTB ● The potential co-manager and the BFD will work closely with the BTB to enforce tour operator regulations to ensure fair access for Belizean tour operators competing with Guatemalan and Honduran operators

Climate Risks - Key climate risks are identified below. Impact and likelihood are measured on a scale from one (1) to three (3) indicating "Low" and "High", respectively. Risk appetite speaks to the R level of risk that the potential co-manager and the BFD are prepared to accept in pursuit of management objectives, before action is deemed necessary to reduce the risk. Risk appetite is

also measured on a 1-3 scale with a score of 1 (Low) indicating that management are committed to acting quickly and decisively to mitigate risk.

Table 44: Climate Risks

Risk	Impact	Likelihood	Appetite
Sea level rise	MEDIUM	MEDIUM	LOW
Rising sea temperatures	HIGH	MEDIUM	LOW
Increased frequency of storms	HIGH	MEDIUM	LOW
Ocean acidification	HIGH	HIGH	LOW
Changes in precipitation	MEDIUM	HIGH	LOW
Increased air temperature	MEDIUM	MEDIUM	LOW

Climate risk controls are provided below. The potential co-manager and the BFD, as co-managers of the SCMR, are risk owners and are charged with responding to and mitigating and adapting to ecosystem risks.

Table 45: Climate Risk Controls

Risk	Controls
Sea level rise	• The potential co-manager and the BFD will monitor sea level rise across key locations within the reserve
Rising sea temperatures	• The potential co-manager and the BFD will monitor sea temperature levels across key locations within the reserve • The potential co-manager and the BFD will maintain close communication with the Coastal Zone Management Authority Institute to facilitate water sampling and data collection
Increased frequency of storms	• The potential co-manager will prioritize the updating of ecosystem maps for the SCMR to identify formations vulnerable to extreme weather events • The potential co-manager will develop a Disaster Risk Management Plan to ensure operational continuity in the event of a natural disaster (DRM plan should include procedures for securing equipment and supplies on Hunting Caye such as fuel)
Ocean acidification	• The potential co-manager and the BFD will monitor sea pH levels across key locations within the reserve • The potential co-manager and the BFD will maintain close communication with the Coastal Zone Management Authority Institute to facilitate water sampling and data collection
Changes in	• The potential co-manager will develop climatic monitoring capabilities on

precipitation	Hunting Caye to track changes in precipitation, winds, etc.
Increased air temperature	• The potential co-manager will develop climatic monitoring capabilities on Hunting Caye to track changes in precipitation, winds, etc.

4.6 Monitoring and Evaluation

The potential co-manager and the BFD are committed to reviewing management effectiveness regularly using the IUCN-WCPA assessment framework outlined below. The potential co-manager and the BFD will conduct yearly assessments of management effectiveness.

About the IUCN-WCPA evaluation framework[161]

The Framework is based on the principle that good protected area management should follow a cyclical process with six stages or elements. Good management needs to be rooted in a thorough understanding of the individual conditions related to a protected area, be carefully planned and implemented and include regular monitoring, leading to changes in management as required. The management cycle illustrated (see Figure 2) identifies six important elements in this process that should, ideally, all be assessed if effectiveness of management is to be fully understood. Management:

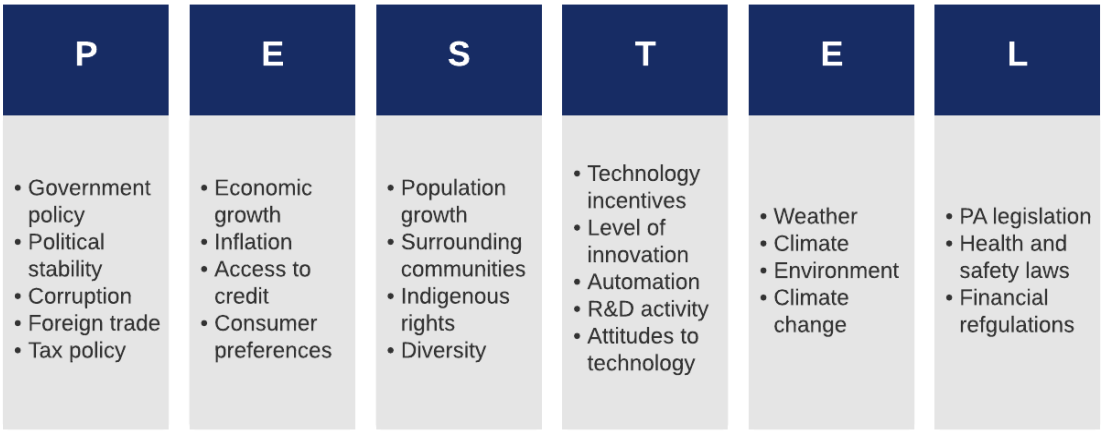
- begins with understanding the **context** of the protected area, including its values, the threats that it faces and opportunities available, its stakeholders, and the management and political environment;
- progresses through **planning**: establishing vision, goals, objectives and strategies to conserve values and reduce threats;
- allocates **inputs** (resources) of staff, money and equipment to work towards the objectives;
- implements management actions according to accepted **processes**; and
- eventually produces **outputs** (goods and services, which should usually be outlined in management plans and work plans)
- that result in impacts or **outcomes**, hopefully achieving defined goals and objectives.

4.6.1 Context

The BFD is committed to reviewing values, threats, and the management environment by meeting regularly with stakeholders and internal assessments. In order to accurately assess the management environment throughout the management life-cycle, the potential co-manager will use the PESTEL framework outlined below.

Figure 45: PESTEL Framework

[161] Source: Hockings, M., Stolton, S., Leverington, F., Dudley, N. and Courrau, J. (2006). Evaluating Effectiveness: A framework for assessing management effectiveness of protected areas. 2nd edition. IUCN, Gland, Switzerland and Cambridge, UK.



4.6.2 Planning

This management plan establishes the vision, goals, objectives and strategies to conserve values and reduce threats within the reserve. However, the BFD acknowledges that unforeseen developments can impact plans and drive strategic adjustments. Results from the contextual analysis will be used to inform any planning adjustments. The potential co-manager and the BFD will share all changes and the rationales with key stakeholders.

4.6.3 Inputs

Human resources - The potential co-manager and the BFD will ensure that human resources are adequate and sufficient for effective management of the SCMR.

Funding - In addition to human resources, the BFD acknowledges the funding obligation for managing a large reserve like the SCMR. Financing for management of Sapodilla Cayes Marine Reserve is currently the sole responsibility of the BFD but it could potentially become a joint commitment between the department and a potential co-manager.[162] A strategic review of management costs was conducted to derive core management costs per acre. Cost estimates were obtained from the 2011 SCMR Management Plan, the Belize Biodiversity Finance Plan, BFD and publicly available financial information for other MPAs . Cost estimates are provided below.

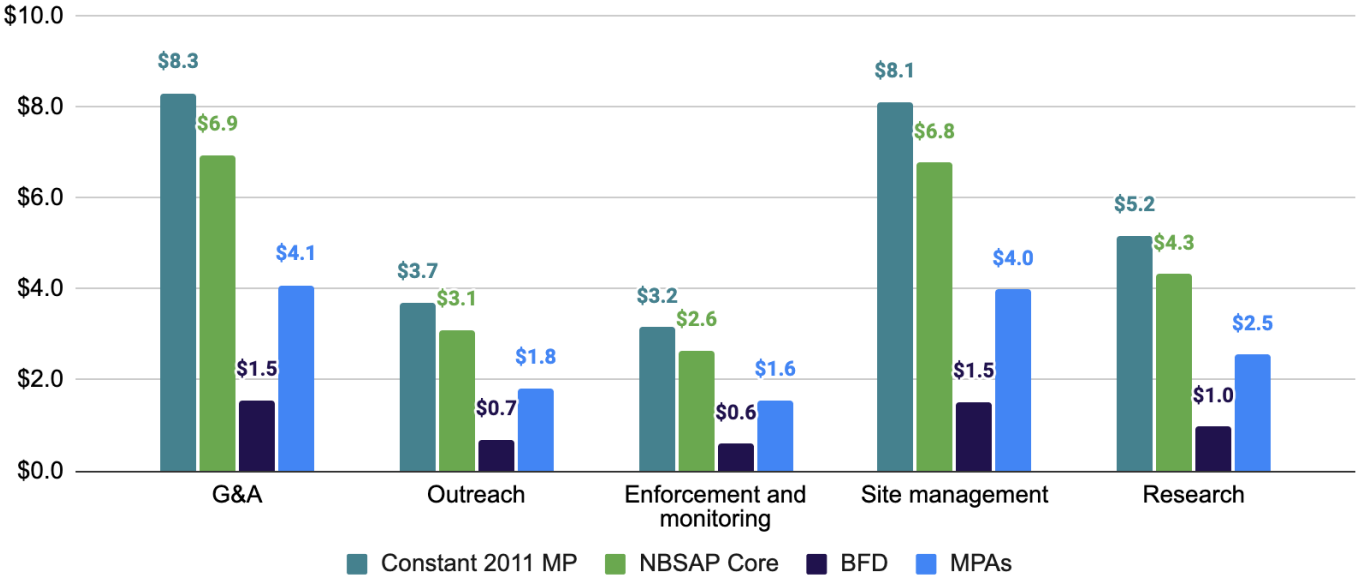
[162] Note: Funding responsibilities are subject to change and are to be finalized under the co-management agreement.

Table 48: Core cost/acre estimates for SCMR (BZD)

Source	Estimate (per acre)	Total Funds (thousands)
BFD	$5.30	$1,703.9
MPAs[163]	$13.99	$1,703.9
NBSAP Priority Goals (Biodiversity Finance Plan)	$23.75	$7,639.9
SCMR Management Plan 2011 (constant)[164]	$28.43	$9,145.3

Based on allocation ratios among the critical management areas defined in the 2011 Management Plan, core costs were estimated for each critical management area.

Figure 48: Core costs by management/ operational area



Discussions with the BEF reveal that salaries alone account for BZ $128 thousand per year to manage the reserve. The BFD is able to maintain four (4) full time positions for: marine reserve manager, biologist and two (2) rangers. There are limited resources for other expenses with a best estimate of BZ $213 thousand for supplies and G&A provided by the BFD. At the current expenditure levels this leaves a gap of **BZ $1.3M**. Under the 2011 Management Plan expenditure levels this would lead to a funding gap of **BZ $8.8M**.

[163] Financial information for other MPAs collected from TIDE audited financials.
[164] Note: Adjusted for inflation.

Based on the financial analysis presented above, the following financial sustainability recommendations are provided. Key partners are identified for successful/ timely implementation.

Table 47: Financial Sustainability Recommendations

Recommendation	Key strategic partners/ collaborators
Enhance (develop) grant writing capacity	• APAMO • NBIO • PACT • CCCCC • External partners, donors
Access larger grants through strategic partnerships	• CCCCC • Coastal Zone Management Institute • Clearwater Marine Research Institute • The Nature Conservancy • Department of the Environment • NBIO • Ya'axche Conservation Trust • Other conservation NGOs • MPA network • Ministry of the Blue Economy • BH Commissioner • World Wildlife Fund (WWF)
Enhance (establish) internal financial controls, policies, and procedures	• MPA network • NBIO
Reduce variable costs through strategic partnerships	• Coast Guard • Immigration Department • Belize Fisheries Department
Increase ticket revenue generation[165]	• NBIO • PACT • Ministry of Blue Economy • Ministry of Sustainable Development
Enhance the potential co-manager's brand name recognition to attract individual donations	• NBIO • Fisheries Department • Ministry of Blue Economy • BTIA • BTB • Ministry of Tourism
Diversify funding base by identifying potential concessional opportunities within the potential co-manager protected areas	• BELTRAIDE • Ministry of Tourism • BTIA • BTB • NBIO

[165] Note: Subject to outcome of national PA fee rationalization exercise currently being conducted by PACT, NBIO, the Ministry of the Blue Economy, and the Ministry of Sustainable Development, Climate Change, and Disaster Risk Management.

	● PACT ● TIDE Tours ● External partners, donors

4.6.4 Outputs

Six Management Programmes are identified under the National Protected Areas Policy and System Plan framework:

A. Natural Resource Management
B. Research and Monitoring
C. Education and Outreach
D. Public Use
E. Site and Infrastructure Management
F. Administration

The conservation strategies outlined for Sapodilla Cayes Marine Reserve in the conservation planning section of the situational analysis are integrated into the management programmes, as are the outputs of the climate change planning, contributing towards the adaptive management process.

A. Natural Resource Management

Objective: The Natural Resource Management Programme focuses on ensuring the maintenance of healthy, functional ecosystems in the face of transboundary impacts and climate change, through surveillance and enforcement, and direct biodiversity management interventions where required.

Sub-programmes: The programme is administered under three sub-programmes:

1. Effective Surveillance and Enforcement - focused on supporting and upholding the Marine Reserve legislation, and to ensure fishing and tourism rules and regulations are enforced.
2. Impact Mitigation - focused on identifying threats and reducing adverse impacts on natural resources within the SCMR
3. Conservation Target Management - focused on identifying key conservation targets and developing key-performance indicators to track progress

Designated authorities: The designated implementing authorities for the sub-programmes as well as key collaborators are provided below.

Sub-programme	Designated authorities	Collaborators
Surveillance and enforcement	The potential co-manager BFD	● Coast Guard ● Port Authority ● Immigration Department
Impact mitigation	The potential co-manager BFD	● Department of the Environment ● CCCCC ● NBIO ● FUNDAECO

		● Port Authority ● Ministry of Blue Economy ● Ministry of Sustainable Development, Climate Change and Disaster Risk Management
Conservation target management	The potential co-manager BFD	● NBIO ● Ministry of Blue Economy ● Ministry of Sustainable Development, Climate Change and Disaster Risk Management

Key activities: Key activities identified under each sub-programme are provided below.[166]

Surveillance and enforcement	

Surveillance and enforcement	● Ensure SCMR has the human resources, equipment and training for effective surveillance and enforcement
	● Ensure effective demarcation of MPA boundaries, for visual recognition of boundaries at all points by fishermen
	● Lobby for the Belize border buoys to be re-installed, for recognition of Belize territory by Honduran and Guatemalan fishermen
	● Ensure infrastructure is in place to minimize tourism infractions - signs, mooring buoys etc.
	● Ensure all SCMR staff are aware of the rules and regulations of the marine protected area, and trained for effective surveillance and enforcement
	● Ensure continued implementation / enforcement of non-extractive regulations within no-take zones of SCMR, with particular focus on:
	  ○ Illegal fishing in Conservation and Preservations Zones
	  ○ Illegal fishing at spawning aggregation site
	  ○ Illegal fishing of undersized conch by tour guides
	  ○ Illegal transboundary fishing incursions
	  ○ Illegal harvesting of turtle eggs
	● Strengthen visitor management, maintenance of visitation data, and enforcement of visitor rules and regulations
	● Implement policies and regulations for all tour boats:
	  ○ Requirement for local guides and boat captains,
	  ○ Use of mooring points,
	  ○ Removal of garbage
	● Enforce recreational policies and regulations in all zones:
	  ○ Divers / snorkelers : licensed guide ratio (in collaboration with BTB)
	  ○ Exclusion of jet ski and water-ski use within Marine Reserve
	  ○ Mooring buoy-use regulations at dive sites and near cayes
	● Identify hotspot areas, times and visiting fishing boats requiring increased enforcement effort, using the potential co-manager and Fisheries Dept. enforcement data, and implement surveillance and enforcement times and locations

[166] Note: Adopted from SCMR Management Plan 2011-2016. Subject to change based on input from Belize Fisheries Department and the potential co-manager.

	• Identify hotspot areas, times and visiting boats / tour operators requiring increased enforcement effort, using the potential co-manager enforcement data, and implement enforcement of visitor regulations accordingly • Increase night patrols within SCMR • Support and uphold Fisheries regulations relevant to maintenance of commercial species within SCMR • Strengthening the permit process for fishermen using the Marine Reserve and the spawning aggregation sites, in collaboration with Fisheries Dept. • Investigate the potential for increasing effectiveness of enforcement through use of on-the-spot automatic fines for violations, development of specific site-level policies and regulations and better management of data to be able to identify and penalize repeat offenders, with ticketing system (3 tickets revokes site level license) • Ensure other Government agencies using Hunting Caye are aware of and follow the MPA regulations, and are engaged for effective management • Ensure effective surveillance and reporting of illegal development activities within the Marine Reserve • Ensure enforcement of research regulations within protected area in coordination with Fisheries Department and the potential co-manager staff • Continue to ensure effective management of local anthropogenic threats through community engagement and awareness programs, with increased awareness of best fishing and tourism practices among immediate resource users • Ensure effective surveillance and reporting of illegal development activities within the Marine Reserve
Staff	• Ensure adequate Fisheries Department surveillance and enforcement staff on site at SCMR at all times • Ensure adequate surveillance and enforcement staff for the potential co-manager • Explore feasibility of training local fishermen and tour guides as Fisheries Officers and Special Constables, to increase enforcement presence
Equipment and training	• Ensure patrols are fully equipped and rangers fully trained for surveillance and enforcement activities (including night patrols and reliable radios installed on boats) • Ensure ranger station is equipped for effective enforcement activities – adequate communications, high staff satisfaction with facilities • Ensure staff are trained and equipped for enforcement of tourism regulations
Reporting	• Maintain patrol log books for SCMR • Maintain logs of boat presence within SCMR • Effective collection of visitor data and recording of entrance fees • Produce quarterly reports, and submit to Fisheries Department and the potential co-manager board • Produce annual reports and submit to Fisheries Department and The potential co-manager board • Strengthen mechanisms to monitor and track infractions, including incorporation of GIS into patrol reports – both extraction and tourism
Collaboration	• Work closely with Port Authority, Coast Guard and DoE towards mitigation of potential groundings including the installation of marker and mooring buoys

	where necessary for reducing boat impacts on reef ● Strengthen collaboration of the potential co-manager and Fisheries Department and strengthen effective enforcement – application of laws and regulations ● Strengthen collaborative enforcement (fishermen, the potential co-manager, Fisheries Dept., Coastguard, BDF, police dept etc.) against transboundary incursions both within and outside the MPA ● Strengthen partnership with Immigration Department, with more effective integration into patrols ● Strengthen collaboration with Belize Tourism Board for effective enforcement of Tourism Legislation within SCMR ● Continue liaising with Port Authority to ensure that all shipping vessels are appropriately equipped and that the lighthouse is in proper working order
Awareness of regulations	● Increase staff awareness of the benefits of marine protected areas – and specifically SCMR ● Ensure all tour guides, caye residents and fishermen are aware of location, rules and regulations and rationale for the Marine Reserve ● Increase awareness of visiting live-aboard boats on the rules and regulations of Sapodilla Cayes Marine Reserve - specifically the non--extractive designation ● Increase community awareness of the benefits of marine protected areas - particularly SCMR ● Engage fishing stakeholders, increasing stakeholder awareness and participation, and understanding of the function of no-take zones of SCMR as source areas, increasing respect for the no take regulations ● Engage and partner with tourism stakeholders, increasing stakeholder awareness and participation ● Inform all visitors of rules and regulations when visiting the Marine ● Reserve through installation of an information board on Hunting Caye, distribution of brochures, and handouts and other educational material ● Outreach to stakeholder communities increasing awareness of the importance of marine protected areas, with dissemination of data on densities of conch and lobster inside and outside functional reserves

Impact mitigation	
Solid waste and water contamination	● Ensure effective waste management through design and implementation an effective waste management plan for SCMR rangers station ● Ensure SCMR rangers station septic system is designed, located and maintained to minimize risk of water contamination ● Lobby for effective waste management in other facilities on Hunting Caye ● Develop 'Best Practice Guidelines' for caye developers, owners and residents in SCMR and the wider SBRC to advise on wastewater management, chemical use and storage, etc. ● Ensure all ships passing through SBRC are following anti-pollution regulations whilst in Belize territorial waters, in collaboration with Port Authority and DoE ● Strengthen links with Department of the Environment for rapid response to pollution events ● Develop and implement strategies to regulate the waste generated by visiting boats (solid / grey water waste) in collaboration with Port Authority and DoE

	● Partner with organizations seeking to mitigate agrochemical contamination of water bodies from land-based sources through promotion of better practices in agrochemical use ● Ensure safe storage of oil and chemicals on Hunting Caye, especially during storm events, and lobby for adoption of best practices in fuel and chemical storage on the other cayes of the Sapodilla range ● Identify source of floating garbage, and lobby for transboundary action to reduce level ● Engage students and other stakeholder groups for voluntary beach cleanup efforts during times of peak garbage ● Establish a specific fund for employment of casual labour to assist in beach cleanup efforts during times of peak garbage
Development and best-practices	● Promote guidelines and best management practices among staff, resource users, visitors and caye owners / leaseholders and residents ● Engage landowners in littoral forest, mangrove and beach vegetation restoration, management and protection ● Collaborate with Ministry of Blue Economy and DoE to ensure compliance with development legislations in SCMR ● Work closely with DOE, Forest Department, etc. to ensure enforcement of all relevant policies and regulations for development activities on the cayes within the Marine Reserve (dredging of sand/coral, clearance of mangroves, water quality and sedimentation) ● Work with developers and government agencies to ensure effective monitoring of environmental impacts from developments and compliance with guidelines ● Develop general guidelines to assist in review of environmental assessments and EIAs for future developments proposed for SCMR, or in SBRC generally ● Identify and implement best means of liaising with caye developers and landowners of cayes within SCMR / in the wider SBRC - areas of conflict and mutual assistance ● Raise awareness of role of mangroves, littoral forest, seagrass, corals, and methods of limiting development impacts (sedimentation - erosion following land clearance; wastewater, sewage and solid waste disposal) targeted at cayes in the SCMR and wider SBRC ● Lobby for conservation easements for cayes within the MPA, particularly for identified critical areas (eg. mangrove area of Frank's Caye and primary turtle nesting sites)
Invasive species	● Work with national partners to develop and implement a comprehensive ● plan for the identification and management of invasive species ● Increase awareness in staff, and tour guides of the potential impacts of invasive species ● Lobby for implementation of policies of no domestic animals or introduced wildlife on turtle nesting cayes

Conservation target management	
General	● Strengthen mechanisms to ensure consistent communication between programmatic areas to support overall adaptive management of SCMR and the SBRC

	● Ensure clear communication, liaison and collaboration between rangers and science staff for the effective management of conservation targets ● Ensure staff are aware of the conservation targets and the role of enforcement and surveillance in ensuring their effective management ● Strengthen collaboration with partners towards implementation of coral reef and mangrove restoration programs in SCMR and the wider SBRC ● Identify and protect key nursery grounds (for all priority marine species) from extraction / damage
Coral reef	● Identify and increase protection of high resilience reef areas, source populations and key larval dispersal routes within and associated with the SCMR, in response to climate change research outputs ● Designate and enforce specific mooring sites and boat access channels to reduce mechanical impacts on corals by boats ● Ensure adequate protection of key herbivores to maintain live coral cover and ecological functions ● Develop initiatives to increase awareness of the importance of parrotfish to the health of the reef among key stakeholders
Commercial species	● Collaborate with Fisheries Dept and Ministry of Blue Economy to implement National Fin Fish Management Strategy ● Collaborate with BFD to monitor commercial species using standard protocols ● Investigate certification system for local restaurants that follow best practices in purchasing lobster, conch and fin-fish species (size, season and species regulations), with information for tourists on how to dine 'ethically' in Punta Gorda, Placencia and coastal resorts
Herbaceous beach vegetation/ mangroves	● Protect nesting and roosting bird populations through engagement of caye owners / developers, control of visitor access and effective surveillance and enforcement ● Lobby against clearance of natural vegetation on the cayes within the SCMR, with increased awareness of use of native vegetation in landscaping, and role in stabilizing cayes ● Investigate the status of Ragged Caye, and if not currently leased, lobby for inclusion within SCMR, to provide representation of natural caye vegetation
Sandy beaches	● Identify, adopt and implement guidelines for managing marine turtle nesting on the Sapodilla Cayes, with training for rangers, visitor awareness, and demarcation of turtle nesting areas, to prevent direct impacts from tourism ● Engage land owners, leaseholders and developers within the SCMR and wider SBRC, and lobby for stakeholder management of turtle nesting beaches ● Liaise with regional and international turtle conservation initiatives

B. Research and Monitoring

Objective: To ensure informed, effective management, and to assess the effectiveness of the reserve co-managers in achieving site objectives.

Sub-programmes: The programme is administered under four (4) sub-programmes:

1. Research - focused on collecting actionable information on the reserve and its natural resources, potential threats, and impacts

2. Monitoring - focused on tracking performance across performance indicators and conservation targets
3. Training - focused on ensuring site staff are capable of conducting research and monitoring activities
4. Collaboration and communication - focused on ensuring participatory management of the reserve, allowing for key stakeholders and partners to facilitate in data collection and monitoring

Designated authorities: The designated implementing authorities for the sub-programmes as well as key collaborators are provided below.

Sub-programme	Designated authorities	Collaborators
Research	The potential co-manager BFD	• University of Belize - Environmental Research Institute • Foreign universities and researchers • FUNDAECO • Healthy Reefs Initiative • NBIO • Ministry of Blue Economy • Department of the Environment • CCCCC • Ministry of Sustainable Development, Climate Change and Disaster Risk Management • IUCN • The Nature Conservancy • Network of local conservation NGOs • APAMO • Other regional and international conservation groups • Ministry of Tourism • Belize Tourism Board
Monitoring	The potential co-manager BFD	• FUNDAECO • ECOMAR • Healthy Reefs Initiative • Department of the Environment • University of Belize - Environmental Research Institute • Fragments of Hope
Training	The potential co-manager BFD	• NBIO • Ministry of Blue Economy • Ministry of Sustainable Development, Climate Change and Disaster Risk Management
Collaboration and communication	The potential co-manager BFD	• NBIO • Ministry of Blue Economy • Ministry of Sustainable Development, Climate Change and Disaster Risk Management • APAMO • The Nature Conservancy

- FUNDAECO

Key activities: Key activities identified under each sub-programme are provided below.[167]

Research	
General research	● Ensure research licenses are procured from the BFD and that license approvals are communicate to the potential co-manager in a timely fashion ● Develop a written agreement for research use of the area, including rules, regulations and guidelines, to be signed by all researchers using the Marine Reserve ● Ensure collaboration with BFD, NBIO, and relevant ministries to ensure that research conducted in the reserve can inform and support management priorities and activities ● Ensure all research conducted within Sapodilla Cayes Marine Reserve keeps to the rules and regulation and agreed research protocols, including research conducted by the potential co-manager and its research partners ● Integrate monitoring and research results into the adaptive management process ● Ensure information on cultural and archaeological resources within the SCMR and SBRC generally are collated and accessible, including position and condition of wrecks ● Increase knowledge of resource use and occupancy – status of land (private property / leasehold), strengthening of visitation data collection,
Priority research	● Ensure adequate baseline is available for management decisions – especially related to climate change adaptation ● Update ecosystem mapping for the Marine Reserve - especially of Cayman Crown Reef complex ● Identify priority research activities in the SCMR from conservation planning and adaptive management requirements, and identify partners / locate funding for implementation ● Identify priority research activities in the SCMR from climate change assessment and planning, and identify partners / locate funding for implementation ● Continue to update baseline species lists for fish, corals, birds and other vertebrates and invertebrates of the protected area ● Disseminate list of priority research activities to research stakeholders active within the SBRC ● Support research that investigates invasive species impacts on coral reef ecosystems and fish population

Monitoring	
Monitoring of impacts	● Develop rapid assessment mechanisms that engage staff and stakeholders, for assessing and monitoring impacts such as ship groundings, disease outbreaks, oil spills etc.

[167] Note: Adopted from SCMR Management Plan 2011-2016. Subject to change based on input from Belize Fisheries Department and the potential co-manager.

	● Ensure post impact assessments are conducted and reports produced and disseminated for all impact events – eg. earthquakes, hurricanes, boat groundings ● Monitor run-off from the southern coastal plain and northern Honduras / Guatemala during extreme storm events using remote sensing information (NOAA website / SERVIR, ICRAN-MAR), and assess impacts on SCMR ● Prioritize monitoring of agrochemical contamination in water / tissue samples ● Monitor nutrient levels and relative algal growth on a regular basis to monitor anthropogenic impacts, particularly in high visitor-use areas, using methods such as stable isotope analysis - adjacent to Hunting Caye, mooring buoys and popular dive sites (also in no-impact control site) ● Develop indicators for Limits of Acceptable Change monitoring of visitor impacts
Monitoring of climate change	● Continue monitoring for coral bleaching, with input into Mesoamerican Coral Reef Watch Programme (through ECOMAR) for early reporting of bleaching episodes ● Identify coral recruitment sources for SCMR, and identify mechanisms to ensure that these are adequately protected, if necessary ● Characterize water currents critical for coral recruitment at SCMR ● Establish monitoring protocols that inform management for building reef resilience ● Investigate mechanisms for direct interventions – eg. coral nurseries, shading of key sites, promoting higher herbivore densities ● Work closely with national and international partners to monitor climate change effects and identify appropriate national and regional management strategies ● Integrate collection of coral fragments into post-impact (hurricane, boat grounding) assessment activities for incorporation into coral restoration programme
Socio-economic monitoring	● Maintain and update accurate socio-economic data on SCMR stakeholder communities ● Conduct economic valuation study on ecosystem services and benefits provided by SCMR
Monitoring of conservation targets	● Maintain and update accurate progress on following conservation targets: ○ Area of Littoral Forest ○ Area of unimpacted littoral forest ○ Area of red mangrove ○ Presence of native caye species ○ Number of Casuarina trees ○ Numbers and species of migratory birds per migration (fall and spring) ○ % of sandy beaches in good conditions (unimpacted by human activities) ○ Number of turtle nests ○ Extent of seagrass ○ Condition of seagrass ○ Number of dredging permits issued within SCMR ○ Number of areas and total area dredged within SCMR ○ Densities of conch ○ Live coral cover ○ Indicator species mortality ○ Recent coral recruitment ○ Herbivorous fish density ○ Diadema density ○ Abundance of sharks ○ Densities of lobster ○ Densities of target finfish species

	○ Number of fishing incursions / violations ○ Number of species using each spawning aggregation site ○ Number of individuals per species using each spawning aggregation site ○ Number of shark species and individuals using SCMR ○ Population density of sea cucumbers ○ Extent / density of seaweed

Training	
General	● Ensure all staff (particularly rangers) understand the reasons behind research and monitoring ● Ensure all staff are aware of, and can articulate, major research and monitoring outputs (state of reef, state of fish resources etc.) ● Ensure any new biologists are trained in monitoring protocols, species identification and data management ● Train staff and rangers in identification of key species (particularly nesting birds)

Communication and collaboration	
Data management	● Maintain database of GIS data, research and monitoring information in order to enhance the level of coordination between researchers, help identify gaps in information, and to provide a platform from which the results can be communicated to a wider audience ● Improve mechanisms to integrate surveillance and enforcement and biological monitoring information ● Strengthen mechanisms for accessing monitoring and research outputs
Communication	● Continue presenting monitoring results in annual reports, and integrate into the adaptive management cycle ● Use available forums for dissemination of results (eg. workshops, conferences, school visits, tour guide meetings. ● Develop digital library of all published work on Sapodilla Cayes Marine ● Reserve and make available, where feasible, for download on line ● Ensure results of monitoring and research outputs are available to staff at SCMR and to other potential co-manager Program Managers
Collaboration	● Strengthen communication and collaboration with coral restoration / reef resilience partners ● Strengthen communication and collaboration with other current and future research partners ● Develop / strengthen mechanisms for tour guides and other stakeholders to participate in monitoring activities of turtles, coral bleaching and lionfish ● Engage BTB and BTIA in climate change adaptation planning

C. Education and Outreach

Objective: Ensure participatory management of the reserve through stakeholder engagement and increased awareness.

Sub-programmes: The programme is administered under four (4) sub-programmes:

1. Engagement and Participation
2. Environmental Education
3. Outreach and Dissemination of Information
4. Sustainable Livelihoods and Training

Designated authorities: The designated implementing authorities for the sub-programmes as well as key collaborators are provided below.

Sub-programme	Designated authorities	Collaborators
Engagement and participation	The potential co-manager BFD	• NBIO • Ministry of Blue Economy • Ministry of Sustainable Development, Climate Change and Disaster Risk Management
Environmental education	The potential co-manager BFD	• University of Belize - Environmental Research Institute • Foreign universities and researchers • FUNDAECO • Healthy Reefs Initiative • NBIO • Ministry of Blue Economy • Department of the Environment • CCCCC • Ministry of Sustainable Development, Climate Change and Disaster Risk Management • IUCN • The Nature Conservancy • Network of local conservation NGOs • APAMO • Other regional and international conservation groups • Ministry of Tourism • Belize Tourism Board
Outreach and dissemination of information	The potential co-manager BFD	• NBIO • Ministry of Blue Economy • Ministry of Sustainable Development, Climate Change and Disaster Risk Management • APAMO
Sustainable livelihoods and	The potential co-manager BFD	• NBIO • Ministry of Blue Economy

training	• Ministry of Sustainable Development, Climate Change and Disaster Risk Management • BELTRAIDE • Belize Chamber of Commerce and Industry • BTIA • BTB • National fishing cooperatives

Key activities: Key activities identified under each sub-programme are provided below.[168]

Engagement and participation	
General	• Develop a Community Participation and Engagement Plan to guide activities within a framework of goals, objectives and targets aligned to target audiences, with input from other potential co-manager programme managers • Engage tourism and fishing stakeholders from key communities through increased awareness, participation and communication • Engage schools in key stakeholder communities through increased awareness activities, participation and communication • Identify and implement mechanisms that will increase stakeholder economic benefits from the protected area – both national and transboundary – added value to trips etc. • Participation Encourage active participation of Board members in management activities and events • Identify and implement mechanisms to increase stakeholder involvement in management and participation in decision making • Engage and train tour guides and fishermen in surveillance activities • Develop and implement mechanisms for participation of tour guides in monitoring activities of turtles, coral bleaching and lionfish • Engage new sectors – the hotel industry, restaurants, and other businesses, within the stakeholder footprint • Develop certification of best practices systems for companies…tour operators, restaurants, live aboard operators etc….and highlight these at promotional events, through the potential co-manager information flyers and other mechanisms

Environmental education	
General	• Give presentations targeting primary and secondary schools in stakeholder communities on the the potential co-manager marine protected areas and their environmental and socio economic benefits • Liaise and collaborate with local NGOs and other regional and international partners for joint educational outreach to schools in stakeholder communities

[168] Note: Adopted from SCMR Management Plan 2011-2016. Subject to change based on input from Belize Fisheries Department and the potential co-manager.

	● Ensure continued communication and collaboration with schools, to build on past successes ● Provide ongoing field trips for students to the reef, to invest in the engagement of future decision-makers ● Identify and implement mechanisms to increase stakeholder involvement in management and participation in decision making ● Engage and train tour guides and fishermen in surveillance activities ● Develop and implement mechanisms for participation of tour guides in monitoring activities of turtles, coral bleaching and lionfish ● Engage new sectors – the hotel industry, restaurants, and other businesses, within the stakeholder footprint ● Develop certification of best practices systems for companies…tour operators, restaurants, live aboard operators etc. and highlight these at promotional events, through the potential co-manager information flyers and other mechanisms

Outreach and dissemination of information	
Dissemination of information	● Ensure all awareness documents relevant to Sapodilla Cayes Marine Reserve are available for download from the BFD and the potential co-manager websites (brochures, leaflets, regulations, posters etc.) ● Produce an annual summary flier summarizing activities and achievements to be distributed to residents, tour guides, tour operators and fishermen, and include income and expenditures for increased awareness and transparency ● Strengthen communication and collaboration between the Education and Outreach Programme and the other the potential co-manager programme areas – particularly to increase effective enforcement, and dissemination of science outputs
Public awareness	● Continue raising awareness in all stakeholders of the benefits of Sapodilla Cayes Marine Reserve ● Encourage greater visitation by local visitors and school groups through organized and guided day trips, school visits and other mechanisms ● Ensure continued production and distribution of brochures on Sapodilla Cayes Marine Reserve, incorporating key biodiversity and ecosystem values, goals and rules and regulations ● Develop and implement targeted public awareness programmes that address specific issues including, but not limited to: o Goals and Objectives of Sapodilla Cayes Marine Reserve o Goals and Objectives of the potential co-manager o Invasive species o Coral Bleaching o Climate Change o Mangroves o Manatee Conservation o Marine protected areas and maintenance of sustainable fish stocks o Value of SCMR no-take zones o Managed access and no-take areas o Sharks o Sea turtles

	○ Pollution ● Ensure there is awareness of Sapodilla Cayes Marine Reserve and the environmental services and benefits it provides to the general public through use of ongoing media opportunities and posters (focusing particularly on biodiversity protection, fisheries production and tourism) ● Increase awareness among stakeholders of the biodiversity value and importance of mangrove, and encourage protection – especially in areas identified as important nursery sites for SCMR ● Increase awareness among fishermen on proper disposal of oil / lube containers, and effects of pollution on the marine environment ● Continued education and awareness activities in stakeholder communities, focusing on the value of SCMR no-take zoning and its ability to help maintain the sustainability of commercial species ● Increase general awareness of the potential co-manager and Sapodilla Cayes Marine Reserve through participation in national events - displays and exhibits at events such as the Agriculture & Trade Show, Earth Day, etc.

Sustainable livelihoods and training	
Training	● Identify and implement effective mechanisms for decreasing incursions through reducing local community dependence on marine resources, through skills training for other occupations and facilitation of opportunities and incentives ● Training of local fishermen and tour guides for participation as Fisheries Officers / Special Constables in surveillance and enforcement activities ● Provision of training opportunities to enhance stakeholder skills in areas of ○ First Aid / CPR ○ Project Management ○ Skills for tour guide for leading in-land tours ○ Small business start-up and management ● Conduct a needs assessment with local community based organizations and associations, to see how the potential co-manager may best partner and / or assist them

D. Public Use

Objective: Focused on ensuring sustainable recreational use of the area, and administered largely through enforcement of visitor regulations.

Sub-programmes: The programme is administered under four (4) sub-programmes:

1. Visitor management
2. Visitor education and interpretation
3. Visitor infrastructure
4. Visitor safety and protection

Designated authorities: The designated implementing authorities for the sub-programmes as well as key collaborators are provided below.

Sub-programme	Designated authorities	Collaborators
Visitor management	The potential co-manager BFD	• NBIO • Ministry of Blue Economy • Ministry of Sustainable Development, Climate Change and Disaster Risk Management • Ministry of Tourism • BTB • BTIA • Tour operators
Visitor education and interpretation	The potential co-manager BFD	• NBIO • Ministry of Blue Economy • Ministry of Sustainable Development, Climate Change and Disaster Risk Management • Ministry of Tourism • BTB • BTIA • Tour operators
Visitor infrastructure	The potential co-manager BFD	• Ministry of Tourism • BTB • Island owners and potential developers • Department of the Environment
Visitor safety and protection	The potential co-manager BFD	• Ministry of Tourism • BTB • Island owners and potential developers • Tour operators

Key activities: Key activities identified under each sub-programme are provided below.[169]

Visitor management	
General	• Encourage greater visitation by local visitors and school groups through organized and guided day trips, school visits and other mechanisms • Maintain accurate visitor records (local and International), as well as records of visitor origin, tour operator, activities, and any enforcement action needed in respect to tourism visitation • Develop and implement strategies and actions to strengthen baseline data collection on resource use of the marine protected area, and data accessibility • Ensure sufficient mooring buoys are installed at key snorkel / dive sites • Work closely with Port Authority, Coast Guard and DoE towards mitigation of

[169] Note: Adopted from SCMR Management Plan 2011-2016. Subject to change based on input from Belize Fisheries Department and the potential co-manager.

	potential groundings including the installation of marker and mooring buoys where necessary for reducing boat impacts on reef
	● Enforce SCMR public use regulations:
	  ○ Enforce 'no take' regulations for tourists and tourism operations in the Conservation and Preservation Zones
	  ○ Ensure dive boats fly ' divers down' flag when divers are in the water
	  ○ Ensure that dive boats follow the legislated diver to guide ratio of 8:1
	  ○ Ensure that snorkel groups follow the recommended guide to snorkeler ratio
	  ○ Ensure boat captains follow anchor-use / mooring regulations
	  ○ Exclusion of jet ski and water-ski use
	  ○ Ensure all users of Hunting Cay (UB students / supervisors / caretakers / Fisheries and Coastguard officers, lighthouse keeper etc.) follow reserve regulations
	● Liaise with Belize Tourism Board for effective enforcement of tourism legislation
	● Develop and implement best practices and guidelines for boats entering Sapodilla Cayes Marine Reserve, with participation of live-aboard companies, boat captains, tour guides and park rangers
	● Work with tour guides to develop a 'code of conduct' for reef based activities
	● Develop certification of best practices system for tour operators (including liveaboard operators)

Awareness	● Ensure visitors, tour guides and tour operators using Sapodilla Cayes Marine Reserve are aware of rules and regulations – clear, on-site signs at Hunting Caye indicating rules and regulations, and through brochures, handouts and other educational material related to regulations ● Increase good practices awareness among dive/snorkel groups through skills training, annual refresher courses on rules, regulations and tourism policies, and development and dissemination of best practices information ● Develop outreach program specifically for the live-aboard companies, employees and clients with literature on rules, guidelines and maps relevant to all the potential co-manager protected areas ● Develop outreach program specifically for the Honduran and Guatemalan tour guides and boat captains with literature on rules, guidelines and maps relevant to Sapodilla Cayes Marine Reserve ● Ensure visitors in independent sailboats visiting Sapodilla Cayes Marine Reserve are aware of rules and regulations, mooring buoy locations and mooring regulations ● Ensure all researchers and students are aware of the rules and regulations of the Marine Reserve, and under the Fisheries legislation

Visitor education and interpretation	
General	● Equip Visitors Centre / Information Centre with interpretive information designed to raise awareness of the environmental and socio-economic benefits and services of the Marine Reserve, and its World Heritage status ● Provide information on sea turtles, turtle nesting and turtle conservation during nesting time, when access to nesting beaches are restricted

	● Provide information on coral reefs and climate change implications ● Provide information on garbage issues, including breakdown of origin of garbage arriving at SCMR ● Provide information and training to tour guides on conservation targets, climate change, coral bleaching, bird use of the cayes, caye vegetation, sharks and other topical subjects to assist them in providing accurate information for their visitors ● Provide quarterly information to tour guides on interesting activities, research outputs, educational activities etc. that can be incorporated into their interpretation during tours

Visitor infrastructure	
General	● Ensure visitor facilities (barbecue stands, picnic tables, bathrooms and visitor centre) are maintained in first class condition ● Ensure bathrooms are adequate for the number of visitors on the caye at any one time ● Ensure sufficient mooring buoys are installed for visitation requirements

Visitor safety	
General	● Ensure Ranger's Station is equipped with good radio communications / satphone ● Ensure Ranger's Station is equipped with an adequate first aid kit ● Ensure all rangers based on Hunting Caye are trained in first aid and CPR, and dealing with marine-based first aid (including lionfish stings) ● Ensure a ranger is on-site at all times when visitors are present ● Ensure all snorkeling / diving groups have the legislated guide / visitor ratio ● Ensure all tour guides and boat captains are trained and licensed ● Ensure enforcement of visitor regulations designed to provide visitor safety

E. Infrastructure Management

Objective: Responsible maintenance of present infrastructure and equipment, and sustainable planning for future infrastructure and equipment needs.

Sub-programmes: The programme is administered under three (3) sub-programmes:

1. Infrastructure
2. Equipment
3. Maintenance

Designated authorities: The designated implementing authorities for the sub-programmes as well as key collaborators are provided below.

Sub-programme	Designated authorities	Collaborators
Infrastructure	The potential co-manager BFD	• Coast Guard • Immigration Department
Equipment	The potential co-manager BFD	• Coast Guard • Immigration Department
Maintenance	The potential co-manager BFD	• Coast Guard • Immigration Department

Key activities: Key activities identified under each sub-programme are provided below.[170]

Infrastructure	
Hunting Caye facilities	• Ensure current on-site staff facilities are maintained / improved for high staff satisfaction • Maintain and improve solar power to supply the staff and visitor facilities on Hunting Caye • Ensure SCMR Ranger Station sewage and grey water system is effective and not contaminating groundwater or waters adjacent to caye

Equipment	
Hunting Caye equipment	• Ensure SCMR Ranger Station is adequately equipped for surveillance and enforcement activities and good radio communications • Install satellite internet for improved communication between the potential co-manager and Sapodilla Cayes staff • Ensure SCMR has an operational and fully equipped boat and engine for surveillance and enforcement activities • Ensure surveillance and enforcement team are fully equipped for day and night patrols • Ensure staff are equipped for health and safety - with extensive first aid kit, life-jackets, fire extinguishers (boat and Ranger Station), flares and sat phone at minimum

Maintenance	
Hunting Caye equipment	• Ensure staff facilities are maintained in first class condition • Ensure visitor facilities are maintained in first class condition • Ensure bathrooms are adequately maintained

[170] Note: Adopted from SCMR Management Plan 2011-2016. Subject to change based on input from Belize Fisheries Department and the potential co-manager.

	● Ensure mooring buoys are adequately maintained

F. Administration

Objective: Prioritize and establish clear reporting procedures and chains of command to ensure that on-site activities and goals are achieved, and that reports are submitted to both the Fisheries Department, the potential co-manager, and key stakeholders regularly and effectively.

Sub-programmes: The programme is administered under five (5) sub-programmes:

1. Administration Procedures
2. Staff
3. Health and Safety
4. Communication and Collaboration[171]
5. Financial Sustainability

Designated authorities: The designated implementing authorities for the sub-programmes as well as key collaborators are provided below.

Sub-programme	Designated authorities	Collaborators
Administrative procedures	The potential co-manager BFD	● APAMO
Staff	The potential co-manager BFD	
Health and safety	The potential co-manager BFD	
Communication and collaboration	The potential co-manager BFD	● APAMO
Financial sustainability	The potential co-manager BFD	● The Nature Conservancy ● NBIO ● Ministry of Blue Economy ● Ministry of Sustainable Development, Climate Change and Disaster Risk Management ● Department of the Environment ● HRI ● FUNDAECO ● MarFund ● UNESCO ● Other funding partners

[171] The BFD is currently working on a tracking system for vessels. Internet provided at Hunting Caye through the Ministry of Immigration. Vessel tracking based on satellite.

Key activities: Key activities identified under each sub-programme are provided below.[172]

Administrative procedures	
Co-management	● Finalize co-management agreement between Fisheries Depart. and the potential co-manager ● Develop systems to ensure consistent communication between Fisheries Department and the potential co-manager programme areas to support overall adaptive management of SCMR and the SBRC ● Develop mechanisms to ensure consistent and effective communication between SCMR on-site staff, Fisheries Department and the potential co-manager ● Identify and implement specific activities that integrate SCMR staff into the potential co-manager's staff structure ● Ensure staff capacity in using operational and work plans effectively, for effective project and operational management ● Preparation of annual workplan and budget by each programme manager in November each year ● Ensure operational plans/ work plans are based on the management plan ● Ensure monitoring and evaluation of operational plans/ work plans on a quarterly basis ● Ensure monitoring and evaluation of management plan on a biennial basis ● Prepare annual State of the Park / SBRC reports including monitoring / research output for SBRC area ● Produce quarterly reports for Fisheries Department reporting, and submit to Fisheries Department and the the potential co-manager Board of Directors ● Develop conflict resolution mechanisms and in-house skills for dealing with public use conflicts

Staff	
General	● Ensure there are sufficient on-site staff for effective management of SCMR ● Ensure all Fisheries Department employees are familiar with organizational policies and procedures ● Ensure all the potential co-manager employees are familiar with organizational policies and procedures ● Ensure all the potential co-manager staff are aware of Administrative and Operations Manual covering topics such as job duties, employee policies, transport policy, gender issues and a staff appraisal process ● Ensure on-site staff have adequate support from Fisheries Dept and the potential co-manager ● Ensure the on-site manager is adequately qualified, and available 100% of the time for effective leadership of management plan implementation ● Conduct an annual evaluation of staff performance and ensure that recommendations are implemented

[172] Note: Adopted from SCMR Management Plan 2011-2016. Subject to change based on input from Belize Fisheries Department and the potential co-manager.

	● Identify human resource skills gaps and implement training programme to build capacity where required ● Conduct an annual review of staff capacity and training requirements ● Continue encouraging participation of local stakeholders through volunteer rangers programme – local fishermen and tour guides ● Seek funds to employ casual labour to assist staff in beach clean ups during times of peak garbage ● Engage local students and community groups in assisting staff in beach clean ups during times of peak garbage
Training	● Ensure operational staff are trained in CPR, First Aid and use of the oxygen kit ● Ensure staff have sufficient administrative training for effective general management, fundamental accounting, budget and proposal / work plan preparation and implementation ● Ensure surveillance and enforcement staff have sufficient surveillance and enforcement training to be effective ● Ensure all on-site and operational staff members are trained in operation and maintenance of reserve equipment (boat handling, outboard engine repair etc.) ● Ensure staff have sufficient training in biodiversity monitoring protocols for effective monitoring ● Ensure staff are trained in conflict resolution, consensus building, public relations and communications skills ● Ensure the Board members have the skills and capacity to perform effectively

Health and safety	
On-site	● Ensure an effective Emergency Plan is in place (to include natural and anthropogenic disasters), and staff are trained in implementation ● Ensure all staff working in SCMR have adequate insurance for their roles

Communication and collaboration	

General	● Ensure a flow of information to on-site staff re. science and monitoring outputs. Ongoing communication and dissemination of information to all stakeholder sectors
	  ○ Fisheries Department
	  ○ Board of Directors
	  ○ Staff
	  ○ Surveillance and enforcement and research partners,
	  ○ Funding partners
	  ○ Stakeholder partners – tour guides, fishermen, schools
	  ○ Government agencies (especially Coast Guard, Port Authority, Department of the Environment)
	  ○ Local decision makers
	● Ensure tour guides operating in the Sapodilla Cayes Marine Reserve are kept informed of reserve activities and management decisions affecting them

Financial sustainability	
General	● Improve the internal financial system, and link expenditures to programme areas ● Assess the socio-economic value of the Marine Reserve to the stakeholders and to the economy of the country in terms of tourism, and also in terms of the less easily measurable factors such as recreation and storm protection ● Seek funding to fully implement the potential co-manager's Financial Plan ● Increased promotion and marketing of Sapodilla Cayes Marine Reserve through media such as video, posters etc. ● Establish an 'honorary Board' to assist with fundraising Investigate mechanisms to diversify funding base ● Seek funding for establishing an endowment fund for long term sustainability ● Market the potential co-manager, with increased brand name recognition locally, nationally and internationally ● Seek to reduce variable costs through strategic partnerships in all programme areas ● Assess and plan for potential liability issues

4.4.5 Outcomes

A primary objective of management of the SCMR is to secure IUCN Green List Certification. The IUCN Green List of Protected and Conserved Areas Standard consists of 17 globally applicable **criteria** categorised under four **components**, supported by 50 generic **indicators**. It provides an international benchmark for quality that motivates improved performance and helps achieve conservation objectives - a green-listed site is one that meets all criteria, across all four components.[173]

[173] Note: It is up to the respective national Expert Assessment Group for the Green List (EAGL) to determine which indicators need adaptation and to draft adapted versions that reflect local circumstances. A public consultation may be necessary prior to the EAGL finalising the adaptation and submitting the adapted Standard to the Standard Committee, which reviews them to ensure alignment with the 17 global criteria, and to maintain the integrity of the global Standard.

Figure 47: IUCN Green List Standard

Sites wishing to achieve 'Green List' status must demonstrate, and then maintain, successful implementation of the IUCN Green List Standard. This is evaluated in three Phases:

1. Application Phase: The first step is a voluntary commitment to the IUCN Green List Programme. This commitment is made through an online registration. As to the SCMR, the potential co-manager and the BFD will provide initial evidence for five indicators drawn from the first three components of the IUCN Green List Standard to demonstrate readiness.
2. Candidate Phase: Once admitted as a Candidate, the potential co-manager and the BFD will consider the full set of criteria, provide evidence for meeting all indicators and address any identified shortcomings over a period of time.[174]
3. Green List Phase:[175] In the event that the SCMR is awarded IUCN Green List status, the potential co-manager and the BFD will be provided a certificate. The area will be afforded the right to use the IUCN Green List of Protected and Conserved Areas logo and claims (in accordance with guidelines), and will be recognised and promoted by IUCN as a global

[174] Note: The candidate phase may take months or even several years depending on the issues that must be addressed. A stakeholder consultation and a site visit by an EAGL representative are also required in this phase. Once complete, candidate sites are put forward for nomination to the Green List by the EAGL.
[175] Note: Sites choose when they are ready for evaluation, and have up to a maximum of five years to achieve certification, which is then valid for a five year period. It is the site's decision to submit their nomination when they consider themselves to be ready.

exemplar in conservation achievement. After a site achieves IUCN Green List Status, the focus shifts towards supporting the site to maintain and enhance that status.

Successful implementation of programmatic action plans should lead to demonstrable, successful conservation outcomes. Programmatic success maps directly to IUCN Green List Standard criteria and components as demonstrated below.

Table 48: Green List Standard Action Plan[176]

IUCN Green List Standard (Outcomes)		Management Programmes (Outputs)					
IUCN Component	IUCN Criteria	NRM	Research and Monitoring	Education and Outreach	Public Use	Site and Infrastructure Mgmt.	Administration
Component 1 - Good governance	Criterion 1.1 - Guarantee legitimacy and voice			■			
	Criterion 1.2 - Achieve transparency and accountability			■			■
	Criterion 1.3 - Enable governance vitality and capacity to respond adaptively						■
Component 2 - Sound design and planning	Criterion 2.1 - Identify and understand major site values		■				■
	Criterion 2.2 - Design for long-term conservation of major site values	■					■
	Criterion 2.3 - Understand threats and challenges to major site values	■	■				■
	Criterion 2.4 - Understand the social and economic context	■	■	■	■		■
Component 3 - Effective management	Criterion 3.1 - Develop and implement a long-term management strategy		■				■
	Criterion 3.2 - Manage ecological condition	■					
	Criterion 3.3 - Manage within the social and economic context of the site	■			■		■
	Criterion 3.4 - Manage threats	■	■	■	■	■	■

[176] Note: A complete list of IUCN Green List Standard indicators is provided in Annex A. The set of indicators to be tracked depends on approval by national EAGL.

	Criterion 3.5 Effectively and fairly enforce laws and regulations										
	Criterion 3.6 - Manage access, resource use and visitation										
	Criterion 3.7 - Measure success										
Component 4 - Successful conservation outcomes	Criterion 4.1 - Demonstrate conservation of major site values										
	Criterion 4.2 - Demonstrate conservation of major associated ecosystem services										
	Criterion 4.3 - Demonstrate conservation of major cultural values										

4.7 Implementation Timelines

The management plan's implementation period is scheduled for five (5) years (2021-2026). Action plans for each of the management programmes are provided below.

4.7.1 Natural Resource Management Action Plan

Natural Resource Management Programme	Present status	Desired status	1	2	3	4	5	Responsible party	Critical success factors
Effective surveillance and enforcement									
Ensure SCMR has the human resources, equipment and training for effective surveillance and enforcement	Ongoing	SCMR continues to be fully staffed						The potential co-manager NRM Programme Director	- Staff complement from Belize Fisheries Department is adequate
Ensure effective demarcation of park boundaries to ensure visual recognition of boundaries at all points	Boundary marker buoys are far apart, and can be hard for fishermen to see from dories. This is ongoing through PACT funding.	Boundaries clearly defined by sufficient, highly visible marker buoys and remain as a priority under the Blue Finance Fund.						The potential co-manager SCMR Site Manager SCMR Head Ranger The potential co-manager Park Rangers	- Logistical support is provided by the Belize Coast Guard and Immigration Department
Ensure continued implementation/ enforcement of non-extractive regulations within no-take zones of SCMR	Spotty enforcement	Continued effective implementation / enforcement of regulations within non-extractive zones of SCMR						The potential co-manager NRM Programme Director	- Technical assistance provided by BCG - Local fishermen facilitate monitoring and detection
Implement policies and regulations for all tour boats – requirement for local guides, boat captains, use of mooring points, removal of garbage	Guatemalan and Honduran tour boats seldom have local guides or boat captains, and do not always follow regulations	Policies and regulations are implemented for all visiting tour boats						The potential co-manager NRM Programme Director	- Education and information provided by Belize Tourism Board (tour guide licensing agency) and the Belize Port Authority (vessel and captain licensing agency) to all operators and captains
Enforce BTB recreational policies and regulations	Some implementation of tourism regulations and policies	Effective implementation of BTB tourism regulations and policies in collaboration with						The potential co-manager SCMR Site Manager SCMR Head Ranger The potential co-manager Park Rangers	- Technical and logistical support from BTB and Ministry of Tourism

Identify hotspot areas, times and visiting fishing boats requiring increased enforcement effort and implement surveillance and enforcement times and locations accordingly	Surveillance and enforcement activities are guided by experience of rangers, but when rangers leave, their knowledge of activity hotspots is lost	Annual maps of enforcement activities are used to guide patrol schedules and locations						The potential co-manager SCMR Site Manager SCMR Head Ranger The potential co-manager Park Rangers	- Technical assistance provided by BCG and local fishermen
Identify hotspot areas, times and visiting boats/ tour operators requiring increased enforcement effort and implement enforcement of visitor regulations accordingly	There is little surveillance and enforcement of tourism activities within the SCMR	Increased surveillance and enforcement of tourism activities within the SCMR guided by past hotspots / times for tourism infractions						The potential co-manager SCMR Site Manager SCMR Head Ranger The potential co-manager E Park Rangers	- Technical assistance provided by BCG and local fishermen
Increase night patrols within and outside SCMR	Limited night patrols in the SCMR and adjacent SBRC.	Regular night patrolling within and outside of the reserve						The potential co-manager SCMR Site Manager SCMR Head Ranger The potential co-manager Park Rangers	- Technical and enforcement support provided by BCG
Impact mitigation									
Ensure all the potential co-manager and BFD staff are aware of threats to the reserve (climate change, invasive species, maritime traffic etc.)	Ongoing	All staff are aware and up to date with threats to the reserve						The potential co-manager NRM Programme Director	
Develop disaster risk management policy for SCMR (groundings, hurricanes, chemical or other hazardous waste spills, invasive species, coral disease)	Not started	Completed Disaster Risk Management Policy and Procedures Manual to inform preparedness in the event of disasters						The potential co-manager NRM Programme Director	- Technical assistance from MSDCC&DRM and NEMO

Establish advisory group with local stakeholders from fishing, agriculture, and tourism sectors to inform impact management	Not started	Advisory group with diverse membership						The potential co-manager Executive Director	- Stakeholder buy-in
Conservation target management									
Develop central repository for performance data to be accessed and analyzed by the potential co-manager and BFD	Not started	Central data repository established						The potential co-manager NRM Programme Director	- Financial support for data collection and database management
Conduct quarterly reviews of conservation target status	Not started	Quarterly reviews						The potential co-manager NRM Programme Director	

4.7.2 Research And Monitoring Action Plan

Research and monitoring programme	Present status	Desired status	1	2	3	4	5	Responsible party	Critical success factors
Research									
Conduct land tenure survey for islands within the reserve	Not started	Up-to-date register of owners, lessors and lessees						SCMR Site Manager/ Temporary Project Manager	- Stakeholder cooperation - Assistance from the Ministry of Natural Resources
Conduct archaeological and cultural resource survey within the reserve	Not started	Up-to-date register of shipwrecks and other archaeological and cultural resources within the SCMR						SCMR Site Manager/ Temporary Project Manager	- Stakeholder buy-in - Support from NICH and Institute of Archaeology
Update ecosystem mapping for the Marine Reserve - especially of Cayman Crown Reef complex	Not started	Up-to-date ecosystem maps of key sites within reserve - especially SPAGs and Cayman Crown Reef						SCMR Site Manager/ Temporary Project Manager	- Collaboration with FUNDAECO, especially in terms of mapping the Cayman Crown Area

Monitoring									
Maintain and update accurate progress on conservation targets (e.g. littoral forest, etc)	Not started	Up-to-date information on status of conservation targets						The potential co-manager NRM Programme Director SCMR Site Manager	
Training									
Ensure all biologists and researchers are trained in monitoring protocols, species identification and data management	Not started	All biologists and research personnel are trained in monitoring protocols, species identification and data management						The potential co-manager Marine Science Director	- FInancial support for continuing education programs and opportunities for staff - System wide capacity building
Train staff and rangers in identification of key species (including nesting birds)	Not started	Staff and rangers trained in identification of key species						SCMR Head Ranger	- FInancial support for continuing education programs and opportunities for staff - System wide capacity building
Collaboration									
Maintain database of GIS data, research and monitoring information in order to enhance the level of coordination between researchers, help identify gaps in information, and to provide a platform from which the results can be communicated to a wider audience	Ongoing	Comprehensive database of GIS data with easy access and accessible visualizations developed for dissemination						SCMR Site Manager The potential co-manager Marine Science Director	

4.7.3. Education And Outreach Action Plan

Education and outreach program	Present status	Desired status	1	2	3	4	5	Responsible party	Critical success factors

Engagement and participation									
Develop a Community Participation and Engagement Plan (including conflict resolution protocol)	Not started	Community Participation and Engagement Plan						The potential co-manager Community Development Officer The potential co-manager Education and Outreach Officer The potential co-manager NRM Programme Director	
Environmental education									
Establish annual presentation schedule in collaboration with Ministry of Education to present on conservation targets and outcomes to primary and secondary students	Not started	MOU with Ministry of Education for annual presentation schedule allowing for presentation across the country						The potential co-manager Executive Director	- Support from the Ministry of Education
Outreach and dissemination of information									
Develop design template for all published the potential co-manager documents	Not started	Design template for all the potential co-manager documents						The potential co-manager Communication Officer	
Recruit graphic designer (outsourced or staff) to develop leaflets, brochures, and all publicly available information	Not started	All published material from the potential co-manager and on the SCMR adhere to the potential co-manager's design template and are user friendly and accessible						The potential co-manager Human Resource Manager	
Sustainable livelihoods and training									
Establish joint partnership with BELTRAIDE (especially SBDC) to identify income diversification opportunities for local stakeholders	Not started	MOU with BELTRAIDE establishing strategic partnership						The potential co-manager Executive Director The potential co-manager Community Development Officer	- Support from BELTRAIDE

4.7.4 Public Use Action Plan

Public use programme	Present status	Desired status	1	2	3	4	5	Responsible party	Critical success factors
Visitor management									
Develop public use regulation brochure to be provided to all visitors and tour guides/ operators	Not started	Public use regulation brochure outlining permissible and restricted activities within the SCMR's zones						The potential co-manager NRM Programme Director The potential co-manager Communication Officer	- Support from BTB and Ministry of Tourism
Visitor education and interpretation									
Conduct signage adequacy survey to identify deficiencies	Not started	Survey conducted and areas in need of attention identified						The potential co-manager NRM Programme Director/ Temporary Project Manager	- Support from BTB and Ministry of Tourism (potentially Bureau of Standards)
Procure signage as needed, preferably using sustainably sourced materials	Not started	Sustainably procured signage to facilitate visitor management						Operations Manager/ Financial Administrator	
Visitor infrastructure									
Conduct infrastructure adequacy review to identify areas in need of improvement	Not started	Infrastructure review complete and infrastructure improvements identified						The potential co-manager NRM Programme Director/ Temporary Project Manager	
Visitor safety and protection									
Ensure ranger's station is equipped with good radio communications / satphone	Ongoing	Ranger's station is adequately equipped. Regular inventory of resources conducted.						The potential co-manager NRM Programme Director Operations Manager	

Coordinate and conduct training workshops for all rangers based on Hunting Caye for first aid and CPR	Not started	All rangers trained in key areas.						The potential co-manager NRM Programme Director/ Temporary Project Manager	- Support from Ministry of Health, Ministry of Tourism, BTIA and/ or BCG
Conduct tour guide and captain survey to assess license compliance	Ongoing	Up-to-date register of licensed tour guides and boat captains that frequent the SCMR						The potential co-manager NRM Programme Director/ Temporary Project Manager	- Support from BTB and Belize Port Authority

4.7.5 Infrastructure Management Action Plan

Infrastructure management programme	Present status	Desired status	1	2	3	4	5	Responsible party	Critical success factors
Infrastructure									
Conduct inventory of all infrastructure on Hunting Caye	Ongoing	Up-to-date inventory of all infrastructure in place						The potential co-manager NRM Programme Director/ Temporary Project Manager	
Conduct inventory of all infrastructure on cayes within the SCMR	Not started	Up-to-date inventory of all infrastructure in place						The potential co-manager NRM Programme Director/ Temporary Project Manager	- Stakeholder buy-in
Conduct annual infrastructure audit	Not started	Annual infrastructure audit						The potential co-manager NRM Programme Director/ Temporary Project Manager	
Equipment									
Conduct inventory of all equipment currently on hand at Hunting Caye	Not started	Up-to-date inventory of all equipment on site at Hunting Caye						The potential co-manager NRM Programme Director/ Temporary Project Manager	

Conduct annual equipment audit	Not started	Annual equipment audit						The potential co-manager NRM Programme Director/ Temporary Project Manager	
Maintenance									
Develop maintenance schedule and log for all infrastructure and equipment	Ongoing	Quarterly maintenance reports on infrastructure and equipment						The potential co-manager NRM Programme Director/ Temporary Project Manager	

4.7.6 Administrative Action Plan

Administrative programme	Present status	Desired status	1	2	3	4	5	Responsible party	Critical success factors
Administration procedures									
Finalize co-management agreement with BFD	Ongoing	Signed co-management agreement						The potential co-manager Executive Director The potential co-manager BOD	- Ministry of Blue Economy input - Revision of co-management framework
Staff									
Conduct an annual review of staff capacity and training requirements	Ongoing	Annual review of staffing requirements						The potential co-manager Human Resource Manager	
Health and safety									
Procure health insurance plans for all on-site managers, researchers and boat captains	Not started	All staff that partake in high risk activities are insured						The potential co-manager Human Resource Manager	- Funding
Financial sustainability									
Increase fundraising efficiency to BZ $5.00 per BZ $1.00 spent	BZ $1.38	BZ $5.00						The potential co-manager Executive Director The potential co-manager Accountant	
Increase program service expense by reducing variable costs	72.4% of total expenses	80% of total expenses						The potential co-manager Executive Director The potential co-manager Accountant	
Submit IUCN Green List Standard application package	Capacitation ongoing	Completed application package by 2024						The potential co-manager Executive Director	- Funding for key programmes and activities - Establishment and support from national EAGL

Annex A: SCMR Boundaries

SAPODILLA CAYES MARINE RESERVE - ALL THAT PORTION of the Caribbean Sea, land and reef known as the Sapodilla Cayes consisting of approximately 321,623.5 acres and comprising the General Use Zone, Conservation Zone I, Preservation Zone, Conservation Zone II, Conservation Zone IIIA, Conservation Zone IIIB and Conservation Zone IV and more fully described as follows:

GENERAL USE ZONE - ALL THAT AREA of the Caribbean Sea and reef except for the areas designated and described below as Conservation Zone I, Preservation Zone, Conservation Zone II, Conservation Zone IIIA, Conservation Zone IIIB and Conservation Zone IV comprising approximately 32,482 acres and commencing at a point A having scaled UTM coordinate of 369498 East and 1791221 North; thence in a Southerly direction to a point B having scaled UTM coordinate of 366061 East and 1779812 North; thence in a Southwestern direction to a point D having scaled UTM coordinate of 363074 East and 1777459 North; thence in a Westerly direction to a point E having scaled UTM coordinate of 359601 East an 177459 North; thence in a Northwesterly direction to a point F having scaled UTM coordinate of 357210 East and 1779812 North; thence in a Northwesterly direction to a point G having scaled UTM coordinate of 355156 EAST and 1787804 North; thence in a Northerly direction to a point H having scaled UTM coordinate of 355156 East and 1791221 North; thence in a Easterly direction to the point of commencement.

CONSERVATION ZONE I - ALL THAT AREA comprising sea and reef containing approximately 651acres commencing at a point PI having scaled UTM coordinate of 357717 East and 1787569 North; thence in a Southeasterly direction for a distance of approximately 4,121 meters to a point P2 having scaled UTM coordinate of 357839 East and 1783450 North; thence in a Northwesterly direction for a distance of approximately 671 meters to a point P3 having scaled UTM coordinate of 357186 East and 1783608 North; thence in a Northwesterly direction for a distance of approximately 3,754 meters to a point P4 having scaled UTM coordinate of 357031 East and 1787358 North; thence in a Northeasterly direction for a distance of approximately 716 meters to the point of commencement.

PRESERVATION ZONE - ALL THAT AREA comprising sea and reef containing approximately 548 acres commencing a point P5 having scaled UTM coordinate of 367722 East and 1786769 North; thence in a Southwesterly direction for a distance of approximately 1,354 meters to a point P6 having scaled UTM coordinate of 367417 East and 1785449 North; thence in a Northwesterly direction for a distance of approximately 1,798 meters to a point P7 having scaled UTM coordinate of 365667 East and 1785859 North; thence in a Northeasterly direction for a distance of approximately 1,588 meters to a point P8 having scaled UTM coordinate of 366507 East and 1787206 North; thence in a Southeasterly direction for a distance of approximately 1,292 meters to the point of commencement.

CONSERVATION ZONE II - ALL THAT AREA comprising sea and reef containing approximately 4,913 acres commencing at a point P6 on the Southwesterly boundaries of the Preservation Zone

having scaled UTM coordinate of 367417 East and 1785449 North; thence in a Southwesterly direction for a distance of approximately 1,355 meters to a point P9 having scaled UTM coordinate of 367320 East and 1784097 North; thence in a Southwesterly direction for a distance of approximately 3,440 meters to a point P10 having scaled UTM coordinate of 365756 East and 1781034 North; thence in a Southwesterly direction for a distance of approximately 4,681 meters to a point P11 having scaled UTM coordinate of 362261 East and 1777920 North; thence in a Northwesterly direction for a distance of approximately 1,639 meters to a point P12 having scaled UTM coordinate of 361258 East and 1779218 North; thence in a Northeasterly direction for a distance of approximately 3,746 meters to a point P13 having scaled UTM coordinates 363328 East and 1782339 North; thence in a Northeasterly direction to a distance of approximately 4,226 meters to a point P7 being the Southwesterly boundary of the Preservation Zone and having scaled UTM coordinate of 365667 East and 1785859 North; thence in a Southeasterly direction for a distance of approximately 1,798 meters to the point of commencement.

CONSERVATION ZONE III A - ALL THAT AREA of the Caribbean Sea, zoned as CONSERVATION ZONE III A and more fully described using the North American Datum of 1927 (NAD27) and scaling all coordinates, in metres, on Zone 16 of the Universal Transverse Mercator (UTM) projection. DESCRIPTION - CONSERVATION ZONE III A: Commencing at a point having coordinates 339608 East, 1785515 North; thence proceeding North for approximately 5,000 meters to point along the Port Honduras Marine Reserve having coordinates 339645 East, 1790516 North; thence north east along the Port Honduras Marine Reserve boundary for a distance of 1,400 meters; thence east for a distance of 14,300 meters to a point being the most north western point of the General Use Zone having coordinates 355156 East, 1791221 North; thence south along the General Use Zone boundary line for a distance of 1,500 meters to a point along the northern boundary of Seal Caye, Sapodilla Cayes Spawning Aggregation Site Reserve having coordinates 355156 East, 1789737 North; thence west along the said boundary line for a distance of 50 meters to a point having coordinate 355111 East, 1789737 North; thence south along the said western boundary of Seal Caye, Sapodilla Caye Spawning Site for a distance of 3,300 meters to a point having coordinate 355111 East, 1786480 North; thence east along the aforementioned spawning site for a distance of 390 meters to a point having coordinate 355496 East, 1786480 North; thence in a direction southeast along the General Use Zone boundary for a distance of 6,900 meters to a point having coordinates 357200 East, 1779812 North, thence continue in a general south- easterly direction along the General Use Zone to point on the along the northern boundary of Rise and Fall Bank Sapodilla Cayes Spawning Site having coordinates 358654 East, 1778391 North; thence west along the said northern boundary of Rise and Fall Bank Sapodilla Cayes Spawning Site for distance of 140 meters to a point having coordinates 358510 East 1778391 North; thence in a direction south along the western boundary of Rise and Fall Bank Sapodilla Cayes Spawning Site for a distance of 3,900 meters to a point having coordinates 358510 East, 1774483 North; thence east along the southern boundary of Rise and Fall Bank Sapodilla Cayes Spawning Site for a distance of 4,400 meters to a point having coordinates 362920 East1774483 North; thence north along the eastern boundary of Rise and Fall Bank Sapodilla Cayes Spawning Site for a distance of 3,000 meters to a point having coordinates 363914 East, 1774459 North; thence east along the southern boundary of the General Use Zone for a distance

of 160 meters to a point having coordinates 363074 East, 1777459 North; thence in a generally north easterly direction along the General Use Zone boundary for a distance of 3,800 meters to a point having coordinates 366061 East, 1779812 North; thence continuing in a north-easterly direction along the General Use Zone boundary for a distance of 280 meters to a point having coordinates 366170 East, 1780066 North; thence in a direction east along the southern boundary of Nicholas Caye, Sapodilla Cayes Spawning Site for a distance of 780 meters to a point having coordinates 366952 East, 1780051 North; thence southwest for a distance of approximately 8,500 meters to a point having coordinates 363425 East, 1772337 North; thence west for approximately 28,100 meters back to the point of origin and encompassing an area of approximately 51,254.6 acres.

CONSERVATION ZONE III B - ALL THAT AREA of the Caribbean Sea, zoned as CONSERVATION ZONE III B and more fully described using the North American Datum of 1927 (NAD27) and scaling all coordinates, in metres, on Zone 16 of the Universal Transverse Mercator (UTM) projection. DESCRIPTION - CONSERVATION ZONE III B: Commencing at a point northeast of Tom Owen's Caye, being the north-eastern point of the General Use Zone and having coordinates 369498 East, 1791221 North; thence in a direction east for a distance of 2,560 meters to a point having coordinates 372060 East, 1791221 North; thence southwest for an approximate distance of 11,200 meters to a point along the Nicholas Caye Sapodilla Cayes Spawning Aggregation site declared under Statutory Instrument No.161 of 2003 having coordinate 367422 East and 1781078 North; thence north along the eastern boundary of Nicholas Caye Sapodilla Cayes Spawning Aggregation site for a distance of 1,800 meters to a point having coordinates 367419 East, 1782835 North; thence in a direction east for a distance of 60 meters to a point along the eastern boundary of the General Use Zone having coordinates 367361 East, 1782835 North; thence in a direction northeast along the eastern boundary of the General Use Zone for a distance of 5,400 meters to a point having coordinates 369498 East, 1787804 North; thence continuing north along the eastern boundary of the General Use Zone for a distance of 3,400 meters back to the point of origin and encompassing an area of approximately 2821.9 acres.

CONSERVATION ZONE IV - ALL THAT AREA of the Caribbean Sea, zoned as CONSERVATION ZONE IV and more fully described using the North American Datum of 1927 (NAD27) and scaling all coordinates, in meters, on Zone 16 of the Universal Transverse Mercator (UTM) projection DESCRIPTION - CONSERVATION ZONE IV: Commencing at a point having coordinates 339608 East, 1785515 North; thence proceeding South for approximately 9,800 meters to a point, having coordinates 339536 East, 1775722 North; thence in a generally Eastern direction, along the Exclusive Economic Zone boundary line, for approximately 65,700 meters to a point having coordinates 392998 East, 1778295 North; thence due north for approximately 12,900 meters to a point having coordinates 392998 East, 1791233 North; thence west for an approximately 20,900 meters to a point having coordinates 327060 East,1791221 North; thence southwest for an approximate distance of 11,200 meters to a point along the Sapodilla Spawning Aggregation site declared under Statutory Instrument No.161 of 2003 having coordinate 367422 East and 1781078 North; thence south along the aforementioned Sapodilla Spawning Aggregation site for approximately 1,040 meters to a point having coordinates 367424 East, 1780042 North; thence

west along the Southern boundary of the said Sapodilla Spawning Aggregation site for approximately 500 meters to a point 366952 East, 1780051 North; thence southwest for a distance of approximately 8,500 meters to a point having coordinates 363425 East, 1772337 North; thence west for approximately 28,100 meters back to the point of origin and encompassing an area of approximately 228,953 acres.

Annex B: Stakeholder Register & Engagement Plan

Group	Stakeholder	Power	Interest	Action
Government	Ministry of Finance, Economic Development and Investment	HIGH	HIGH	Manage Closely
Government	Ministry of Agriculture, Food Security and Enterprise	HIGH	HIGH	Manage Closely
Government	Ministry of Blue Economy and Civil Aviation	HIGH	HIGH	Manage Closely
Government	Belize Fisheries Department	HIGH	HIGH	Manage Closely
Government	Ministry of Sustainable Development, Climate Change and Disaster Risk Management	HIGH	HIGH	Manage Closely
Civil Society	Belize Red Cross	LOW	HIGH	Keep Satisfied
Communities	Punta Gorda Town Council	LOW	HIGH	Keep Satisfied
Communities	Punta Barranco community	LOW	HIGH	Keep Satisfied
Communities	Mango Creek community	LOW	HIGH	Keep Satisfied
Communities	Placencia community	LOW	HIGH	Keep Satisfied
Communities	Punta Negra community	LOW	HIGH	Keep Satisfied
Communities	Monkey River community	LOW	HIGH	Keep Satisfied
Civil Society	Caribbean Community Climate Change Centre	LOW	HIGH	Keep Satisfied
Government	Ministry of Sustainable Development, Climate Change and Disaster Risk Management	HIGH	HIGH	Manage Closely
Government	National Climate Change Office	LOW	HIGH	Keep Satisfied
Government	Department of the Environment	LOW	HIGH	Keep Satisfied
Government	Coastal Zone Management Institute	HIGH	HIGH	Manage Closely
Civil Society	University of Belize - ERI	LOW	HIGH	Keep Satisfied

Civil Society	PHMR Advisory Council and Managed Access Committee for PHMR and SCMR	LOW	LOW	Monitor

Output	Activity	Stakeholder	Format	Level of Engagement	Actions Required
Develop a current state analysis of the SCMR	Convene meetings to identify national priorities, regulatory framework and enabling environment.	Ministry of Finance, Economic Development and Investment	Virtual	Manage Closely	Schedule meetings to define national priorities, regulatory framework and enabling environment Establish level of updates to be provided throughout project life-cycle
		Ministry of Agriculture, Food Security and Enterprise	Virtual	Manage Closely	
		Ministry of Blue Economy and Civil Aviation	Virtual	Manage Closely	
		Belize Fisheries Department	Virtual	Keep Satisfied	
		Ministry of Sustainable Development, Climate Change and Disaster Risk Management	Virtual	Manage Closely	
	Convene meetings to identify social issues and concerns of indigenous communities	Belize Red Cross	Virtual	Keep Satisfied	Schedule meeting to discuss concerns of indigenous and surrounding communities
		Punta Gorda Town Council	In-person	Keep Satisfied	
		Placencia community	In-person	Keep Satisfied	
		Punta Barranco community	In-person	Keep Satisfied	
		Punta Negra community	In-person	Keep Satisfied	
		Mango Creek	In-person	Keep Satisfied	

		community			
		Monkey River community	In-person	Keep Satisfied	
	Convene meetings to identify sustainability issues	Caribbean Community Climate Change Centre	Virtual	Keep Satisfied	Schedule meetings to identify sustainability issues that SCMR management should take into account
		Ministry of Sustainable Development, Climate, Change and Disaster Risk Management	Virtual	Manage Closely	
		National Climate Change Office	Virtual	Keep Satisfied	
		Department of the Environment	Virtual	Keep Satisfied	
		Coastal Zone Management Institute	Virtual	Manage Closely	
		Belize Fisheries Department	Virtual	Keep Satisfied	
	Convene meetings to identify relevant scientific literature that can facilitate desktop research and situational analysis	University of Belize - ERI	Virtual	Keep Satisfied	Schedule meeting to discuss relevant literature that will be useful for situational analysis and project success
		Coastal Zone Management Institute	Virtual	Manage Closely	

Annex C: IUCN Monitoring Package Sub-indicators

Non-Biodiversity Indicators (Young et. al. 2005)

1. Resource Information

1.1 Physical Environment
1.2 Biotic Environment
1.3 Cultural and Archaeological Resources
1.4 Social, Cultural, and Economic Context
1.5 Resource Use and Occupancy
1.6 Tenures and Claims
1.7 Conservation Target
1.8 Systematic Threat Assessment
1.9 Traditional Knowledge
1.10 Information Management Systems
1.11 Environmental Monitoring Activities
1.12 Functional Scientific Research Activities

2. Resource Management

2.1 Legal: Legal Status
2.2 Legal: Boundary Survey and Demarcation
2.3 Legal: Permit, and Approval Processes
2.4 Tenure Claim Conflict Resolution
2.5 Guidelines and Best Management Practices
2.6 Natural Resource Management
2.7 Protection: Surveillance Activities
2.8 Protection: Enforcement Activities
2.9 Visitor and Tourism Management Activities
2.10 Visitor and Tourism Monitoring Activities

3. Community Participation and Benefits

3.1 Communication Activities
3.2 Stakeholder Engagement
3.3 Educational Activities
3.4 Dissemination of Knowledge and Information
3.5 Level of Stakeholder Participation in Management Benefits
3.6 Local Actors Leading Management
3.7 Volunteer Activities
3.8 Strength of Social Capital
3.9 Capacity Building Strategies
3.10 Socio-Economic Benefits Strategy
3.11 Extent of Local Economic Benefits
3.12 Sustainable Use for Economic
3.13 Employment in activities related to the protected area
3.14 Local Recognition of Protected Area Benefits

4. Management Planning

4.1 Management Plan Implementation
4.2 Operational Plan Implementation
4.3 Regulation and Zoning Implementation
4.4 Guidelines and Best Management Practices
4.5 Long Term Management Needs Identification
4.6 Program Monitoring and Evaluation

5. Governance

5.1 Protected area objectives
5.2 Co-management agreements
5.3 Administrative autonomy
5.4 Advisory Committee
5.5 Board of Directors
5.6 Inter-organizational mechanisms

6. Human Resources

6.1 Qualified Site Manager
6.2 Site Manager Availability
6.3 Administrative Staff Availability
6.4 Technical, Scientific, and Professional Staff Availability
6.5 Operations Staff Availability
6.6 Human Resource Assessment
6.7 Training and Development
6.8 Staff Satisfaction

7. Financial and Capital Management

7.1 Funding Adequacy
7.2 Revenue Generation
7.3 Financial Management
7.4 Infrastructure Adequacy
7.5 Equipment Adequacy
7.6 Internal Access Adequacy
7.7 Signage Adequacy
7.8 Maintenance Adequacy

Annex D: Green List Standard

Component	Criterion	Indicator	Generic Indicator	Same Means of Verification & Notes
Good governance	Criterion 1.1 - Guarantee legitimacy and voice	GLS-V1.1-1.1.1	The site's governance structure is clearly defined and documented and in accordance with relevant national or regional government, jurisdiction or recognised authority specifications.	Foundational documents or equivalent containing rules, bylaws, governance structure.
		GLS-V1.1-1.1.2	The site's local governance structures and mechanisms provide civil society, stakeholders and rights-holders with appropriate opportunities to participate in management planning, processes and actions.	Foundational documents or equivalent explaining rules, bylaws, governance structure. Minutes of meetings during management plan development.
		GLS-V1.1-1.1.3	The site's local governance structures and mechanisms recognise the legitimate rights of Indigenous Peoples and local communities.	Documentation of formal or in formal relationships / agreements with relevant groups. Meetings with local and indigenous communities. Guidance on Indigenous Rights is contained in the UN Declaration on the Rights of Indigenous Peoples1.
		GLS-V1.1-1.1.4	Rights-holders and stakeholders are effectively involved in decision-making and the adaptive management of the site	Clear identification of rights- holders and stakeholders. Discussion with rights-holders and stakeholders. Discussion with site managers. Documentation of formal or informal relationships/agreements with relevant groups. 'Effective involvement' will be assessed by the EAGL.
		GLS-V1.1-1.1.5	Governance arrangements help advance gender equity in relation to management of the site.	Documented evidence of efforts to improve and maintain gender equity through governance and decision-making structures, management and employment programmes, employment records. Governance arrangements help advance gender equity in and around the site.
		GLS-V1.1-1.1.6	The defined governance structures and mechanisms are accepted by major constituents (civil society, rights-holders and stakeholders), reflecting the governance category of the site.	Documentation of formal or informal relationships / agreements between major constituent groups. Discussions with constituent groups.
	Criterion 1.2 - Achieve transparency and accountability	GLS-V1.1-1.2.1	The governance structures and key documents on management are readily accessible to civil society in an easily understandable format. Key documents include the site's management plan or equivalent, relevant subsidiary plans and	Confirmation of public accessibility of the listed documents, records and other information

			other key direction documents.	
		GLS-V1.1-1.2.2	Where a formal decision- making body exists, the current membership of the body is publicly available and procedures for establishment and membership of the body are publicly accessible, or where there is no decision- making body appointed, the names and contact details of formal decision-makers such as a Minister or Agency Director are publicly accessible.	Confirmation of public availability of the current membership of any decision-making body for the site. Confirmation of public accessibility of the relevant details
		GLS-V1.1-1.2.3	The outcomes of discussions by decision-making bodies or decision- makers in relation to issues raised by civil society, rights-holders and stakeholders are publicly available.	Assessments and reports confirming there is appropriate, clear and regular communication of decisions from decision- making bodies or decision-makers. There may be cases where public availability of some discussions is not appropriate, especially in relation to cultural heritage measures.
		GLS-V1.1-1.2.4	A readily accessible process to identify, hear and resolve complaints, disputes or grievances related to the governance or management of the site is in place.	Assessments and reports, endorsed by stakeholders, confirming there is an appropriate process in place.
	Criterion 1.3 - Enable governance vitality and capacity to respond adaptively	GLS-V1.1-1.3.1	Procedures are in place to ensure that results from monitoring, evaluation and consultation are used to inform management and planning processes including the establishment of goals and objectives.	Monitoring reports with recommendations on corrective management actions. Documentation of procedures for connecting monitoring and evaluation. There may be cases where some monitoring information should not be public, such as the location of endangered species or cultural heritage matters.
		GLS-V1.1-1.3.2	Planning and decision- recognize relevant conditions, issues and goals at national and regional scales that impact the protected area.	Documentation of planning processes.
		GLS-V1.1-1.3.3	Planning and management processes draw on multiple knowledge sources (scientific, experiential, local and traditional knowledge).	Documentation of planning processes clearly demonstrating knowledge sources and how they are sourced and used in decision-making processes.
		GLS-V1.1-1.3.4	The site has, where relevant, considered historical changes and future projections in social, ecological and climate conditions.	References used for planning processes; Considerations included in management plan or equivalent.

Sound design & planning	Criterion 2.1 - Identify and understand major site values	GLS-V1.1-2.1.1	The site meets the IUCN definition of a Protected Area and/or is recognised as a 'Conserved Area'	Foundational documents or equivalent; Documented consultation with site management. Reference to IUCN Protected Area definitions and IUCN guidance on Conserved Areas and 'Other Effective Area-based Conservation Measures' (e.g. national frameworks). Foundational documents are the baseline documents used to manage the site, including management plans, systems plans, national legislation, national protected areas framework documents, etc.
		GLS-V1.1-2.1.2	The site has been listed and correctly assigned one of the six IUCN Protected Area management categories, or has been listed as an 'Other Effective Area-based Conservation Measure', and been assigned one of the four IUCN governance types in the UN Environment World Conservation Monitoring Centre World Database on Protected Areas (WDPA).	Reference to the UN Environment World Conservation Monitoring Centre World Database on Protected Areas (WDPA), with all data fields completed, accessible through the Protected Planet® portal. Sites not formally listed as Protected Areas under the formal WDPA dataset can be included by WCMC as a 'Conserved Area' category, for example as Indigenous and Community Conserved Areas, or as 'Other Effective Area-based Conservation Measures'. The four governance types can be found in IUCN Governance of Protected Areas: from Understanding to Action, Best Practice Protected Areas Guideline Series No. 203.
		GLS-V1.1-2.1.3	The site has a current management plan or equivalent that is used to guide management priorities and activities.	Management plan or equivalent. Work programmes and activities indicating conformity with management plan objectives and priorities.
		GLS-V1.1-2.1.4	The major natural values and associated ecosystem services and cultural values of the site are clearly identified and understood.	Foundational documents or equivalent. Management plan or equivalent. Scientific research papers. Related databases. Reports on traditional and local knowledge, as appropriate. Feedback from stakeholders.
	Criterion 2.2 - Design for long-term conservation of major site values	GLS-V1.1-2.2.1	The designated site is large enough and sufficiently connected to other habitats or ecosystems to achieve the goals and objectives for the site's major values for nature conservation.	Management planning documentation including maps. Consultation with site management. References to scientific research justifying conclusions. Consultation with relevant experts.
		GLS-V1.1-2.2.2	The site is part of an identified conservation network which is designed to meet goals of representation, replication, connectivity and resilience.	Management planning documentation including maps. Site system plan or gap analysis. Consultation with site management.

		GLS-V1.1-2.2.3	Where a major site value is 'ecological integrity': • The site contains an assemblage of native species and ecosystem types that is characteristic of the region, with intact ecological processes and trophic systems • The site is large enough and sufficiently well connected to sustain a viable species population and ecosystem processes in the long term.	Maps of site and surrounding area. Management planning documentation. Consultation with site management. References to scientific research justifying conclusions. Specific research projects on species and/or ecosystem types. Consultation with relevant experts.
	Criterion 2.3 - Understand threats and challenges to major site values	GLS-V1.1-2.3.1	Major current and potential threats to major natural values and associated ecosystem services and cultural values of the site are identified, understood and documented, and their location, extent and severity described in sufficient detail to enable effective planning and management to address them.	Management plan or equivalent listing threats for each major value. Documentation of consultation with relevant experts. Documented method and process for identifying threats.
		GLS-V1.1-2.3.2	The likely impact of climate change on the major site values has been assessed, understood and documented.	Management plan or equivalent documenting climate change threats. Consultation with relevant experts.
	Criterion 2.4 - Understand the social and economic context	GLS-V1.1-2.4.1	The social and economic characteristics of the region that may be affected (positively or negatively) by the site's designation and/or current management have been identified and the location, extent and magnitude of effects of the site on social and economic characteristics have been goals and objectives. described in the management plan or equivalent.	Social impact report(s), assessments. Consultation with site management. Consultation with relevant experts: Management plan or equivalent.
		GLS-V1.1-2.4.2	The social and economic benefits and effects have been considered in the development of management goals and objectives for the site in the management plan or equivalent.	Assessment that benefits and impacts have been considered in the management plan or equivalent. Consultation with appropriate representatives of potentially affected rights-holders and other stakeholders.
Effective management	Criterion 3.1 - Develop and implement a long-term management strategy	GLS-V1.1-3.1.1	The site has a current management plan or functional equivalent which includes: a) the goals and objectives for management of the natural values and social and / or economic objectives (where relevant) identified in Component 2. b) the management strategies and activities to achieve these goals over the long term and an indication of the activities that are allowed or prohibited in the site and any zoning or temporal / spatial restrictions on access to or use of	Management plan or functional equivalent. Evidence of consultation processes. Formal approval of the management plan or equivalent. The management plan should also document major natural values and associated ecosystem services and cultural values (2.1), and threats to these values (2.3) and the likely impact of climate change on values (2.4).

			the site.	
		GLS-V1.1-3.1.2	The site can demonstrate that management activities and policies, and/or legislation and regulations are being implemented and are consistent with the management plan (or equivalent).	Annual work plan or equivalent. Consultation with site management.
		GLS-V1.1-3.1.3	Adequate, functional and safe equipment and infrastructure is available and accessible to staff as appropriate to manage the site.	Documentation which may include photos, maintenance schedules for major equipment, visual inspections, etc.
		GLS-V1.1-3.1.4	The site has adequate numbers of appropriately trained staff, led by an effective management team, to implement all aspects of its management plan in the long term.	Staff organisational chart and documents. Discussion with staff and local knowledgeable experts.
		GLS-V1.1-3.1.5	Management efforts support equity, including gender equity, related to site management.	Staff organisational chart and documents. Reports or information on implementation of annual work plans. Discussion with staff and local knowledgeable experts
		GLS-V1.1-3.1.6	Financial constraints are not threatening the capacity of management to achieve the site's objectives.	Reports or information on implementation of annual work programmes. Discussion with staff and local knowledgeable experts.
	Criterion 3.2 - Manage ecological condition	GLS-V1.1-3.2.1	Strategies and actions to maintain ecological attributes and processes (including natural disturbances) to maintain or enhance the site's major values are identified and implemented.	Relevant regional strategies. Management plan or equivalent. Annual work plan or equivalent. Consultation with site management. Operational plan.
		GLS-V1.1-3.2.2	The site can demonstrate that management activities related to natural values are being implemented and are sufficient for the maintenance of the site's major natural values and ecological processes.	Relevant regional strategies. Management plan or equivalent. Annual work plan or equivalent. Consultation with site management. Operational plan.
	Criterion 3.3 - Manage within the social and economic context of the site	GLS-V1.1-3.3.1	The social and economic context of the site has been incorporated into management, based on consideration of social and economic goals and objectives for the site, as established in Criterion 2.4.	Annual work plan or equivalent. Evidence of consideration of social and economic context in framing of objectives during the management planning process.

		GLS-V1.1-3.3.2	Opportunities to enhance the social and economic benefit of the site to local communities (where consistent with conservation of major site values) are considered during reviews of management plans and through adaptive governance, management and planning processes.	Records of results of management's consultation with local stakeholders and rights-holders. Management plan or equivalent. Discussions with local stakeholders and community members.
	Criterion 3.4 - Manage threats	GLS-V1.1-3.4.1	The site management is implementing a work programme that identifies effective responses to each of the major threats to (a) major site values identified under Criterion 2.3 or (b) the achievement of the site's goals and objectives including long term and 'external' threats.	Annual work plan or equivalent. Management plan or equivalent. Discussions with local stakeholders and community members. Consultation with relevant experts.
	Criterion 3.5 Effectively and fairly enforce laws and regulations	GLS-V1.1-3.5.1	Patrol and surveillance systems, or equivalent, are in place where needed, are adequately set up with sufficient resources and effective operational procedures.	Records of patrol and surveillance activity, including frequency, coverage of key areas. Documentation of appropriate system of management of patrol and surveillance data.
		GLS-V1.1-3.5.2	Legal or customary compliance mechanisms are supported including the equitable application of appropriate sanctions to offenders.	Documentation of compliance and enforcement systems. Evidence of structured framework around compliance mechanisms that ensures appropriate actions are taken in response to offences with more than one person involved in decision-making. Record of the results of prosecutions.
		GLS-V1.1-3.5.3	Laws and regulations regarding the use of the site are accessible to civil society, stakeholders and rights-holders.	Evidence of relevant available information.
	Criterion 3.6 - Manage access, resource use and visitation	GLS-V1.1-3.6.1	The types and levels of permitted activities are clearly described, and are compatible with the conservation of major site values.	Documented description of permitted uses in management plan or equivalent. Consultation with site management. Environmental impact studies. Consultation with relevant experts.
		GLS-V1.1-3.6.2	Where use and access are permitted: • Uses and access are managed to minimise harm to the major site values, for example through permits, design, access control, or education. • The site's management strives to accommodate the needs of users, so far as this is compatible with the achievement of site objectives	Reference to site rules, bylaws, etc. Records of meetings of governing bodies, management committees, etc. Discussions with local stakeholders and community members.

		GLS-V1.1-3.6.3	The nature and level of permitted access for visitors are clearly described and are compatible with the conservation of major site values and objectives.	Documented description of permitted visitor access in management plan or equivalent, or tourism management plan. Consultation with site management. Impact studies, visitor records. Consultation with experts.
		GLS-V1.1-3.6.4	Where visitor access is permitted: • Visitor impacts are managed to minimise harm to major site values, for example through permits, access control, the provision and siting of facilities, education and enforcement • There is no evidence that the impacts of visitors are majorly threatening the achievement of the site's objectives • Visitor services and facilities are appropriate to the character, values and use of the site • Visitor services and facilities meet specified safety standards • Visitor services and facilities meet reasonable standards of environmental sustainability • Interpretive, educational and information services for visitors meet visitors' needs (e.g. the needs of different audiences or age groups) • The tourism industry within the site is managed to support the site's objectives • Consideration has been given to the use of the site by disadvantaged people, and their needs have been adequately taken into account.	Documented description of provisions for visitor management. Visitor records. Visitor response surveys. Consultation with site management. Consultation with experts. Consultation with representatives of the local community. Consultation with representatives of the tourism industry within the site's boundaries. Report or other documentation in relation to the provision made for access by, and responses to the needs of disabled and disadvantaged people. Where safety standards are absent for a country or a region, the EAGL should apply reasonable judgement to the safety protocols used by the site.
	Criterion 3.7 - Measure success	GLS-V1.1-3.7.1	For each of the major site values identified under Criterion 2.1, a monitoring system is in place and a set of performance measures has been defined and documented, which provides an objective basis for determining whether the associated value is being successfully protected.	Monitoring programme documentation. Discussion with site managers. Consultation with relevant experts.
		GLS-V1.1-3.7.2	A threshold level has been specified and assessed in relation to each set of performance measures that relate to natural values, that if achieved, is considered to demonstrate objectively that the associated major site value is being successfully conserved. As appropriate, threshold determination can include the assessment of conservation impact based on change in major values over a specified time period compared to those anticipated without the protected	Monitoring programme documentation. Discussion with site managers. Consultation with relevant experts.

			and conserved area.	
Successful conservation outcomes	Criterion 4.1 - Demonstrate conservation of major site values	GLS-V1.1-4.1.1	The site meets or exceeds the performance thresholds for the conservation of major natural values, specified in Indicator 3.7.2, or meets the requirements specified in Indicator 4.1.2.	The achievement of each natural value threshold should be documented through the site's established monitoring programme. Thresholds should establish the condition of the natural value as being good, fair or in poor condition[13] (see Woodley, 2013 for examples).
		GLS-V1.1-4.1.2	The EAGL has recognised the external context in which the site operates as being especially challenging, and management is responding to prevent loss of the value.	The achievement of each natural value threshold should be documented through the site's established monitoring programme. In rare cases, where the EAGL determines that extreme external circumstances have impaired the condition of the natural value, consideration may be given to extraordinary efforts to maintain the value despite the extreme circumstances. For example, park staff might have worked diligently to protect rhinos despite the presence of organised poaching gangs. Rhino populations might be in poor conditions, but would have disappeared without the intervention of park staff.
	Criterion 4.2 - Demonstrate conservation of major associated ecosystem services	GLS-V1.1-4.2.1	The site meets or exceeds the performance measures for the conservation of ecosystem services, as specified in Indicator 3.7.1.	The achievement of each ecosystem service performance measures should be documented through the site's established monitoring programme.
		GLS-V1.1-4.2.2	The provision of ecosystem services does not significantly impair the ecological values of the site.	Assessment against the monitoring data. Discussion with local experts.
	Criterion 4.3 - Demonstrate conservation of major cultural values	GLS-V1.1-4.3.1	The site meets or exceeds the performance measures for the conservation of cultural values, as specified in Indicator 3.7.1.	Discussion with local experts. The achievement of each cultural value performance measure should be documented through the site's established monitoring programme. The maintenance and enhancement of identified cultural values should be part of the site's monitoring plan.