

# Marine Protected Areas Atlas of Belize

A celebration of Belize's wealth of natural marine resources  
and of the people they support



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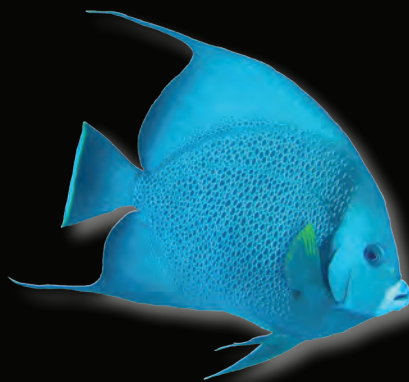
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# Marine Protected Areas Atlas of Belize

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BAS / Lighthawk

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Rachel Graham / MarAlliance



**This project is dedicated to all people of Belize whose lives are touched by Belize's reef - particularly the fishers, fisheries officers, tour guides, protected area rangers and managers. It is also dedicated to the children of Belize - the reef will be yours to care for one day!**

**We would like to thank the following organizations for their input into the Marine Protected Areas Atlas**

**Belize Fisheries Department  
Belize Forest Department**

**Belize Audubon Society  
Blue Ventures Conservation  
Caye Caulker Marine Reserve  
COMPACT**

**Fragments of Hope  
Friends of Swallow Caye  
Hol Chan Marine Reserve**

**MarAlliance  
Placencia Producers Cooperative  
Society**

**Rio Grande Fishing Co-operative  
Sarteneja Alliance for Conservation  
and Development  
Toledo Institute for Development and  
Environment**

**Turneffe Atoll Sustainability  
Association**

**Wildlife Conservation Society  
World Wildlife Fund**

**and those individuals who provided  
photographs and assisted with  
document preparation**



**Wildtracks  
office@wildtracksbelize.org**



# Introduction

**The coastal waters of Belize are an area of outstanding beauty, with the largest barrier reef in the western hemisphere, offshore atolls, crystal clear waters, mangrove forests, coastal lagoons and estuaries, and several hundred idyllic sand cayes.**

The atolls, reef and coastal mangroves provide critical protection against tropical storm events and coastal flooding by breaking the force of storm surges from the Atlantic. Coastal mangroves are also important in providing protection, buffering the land against tropical storm force winds and preventing shoreline erosion.

The reef supports a fishing industry with strong traditional roots, focused on the shallow waters between the coast and the barrier reef, and on the three offshore atolls. It is both socially and economically important to Belize, with more than 2,750 fishermen directly dependent on capture fisheries. This in turn supports an estimated 12,500 Belizeans from 20 communities, and with a further 1,000 people involved indirectly in processing and export.

The tourism industry is the number one foreign exchange earner - nearly one million visitors travelled to Belize in 2015, drawn by the mix of incredibly biodiverse marine and inland protected areas. Tourism is primarily based on the natural and cultural resources, with visitors enjoying the beauty of the cayes, coastal communities and coral reef, the excitement of diving the Blue Hole, swimming with whale sharks, snorkelling the vibrant reef, and sport fishing.

## **Why a Marine Protected Areas Atlas?**

The Belize Barrier Reef Reserve System World Heritage Site is a unique economic, social and environmental asset for Belize and the wider global community. Belize depends on these marine resources - but how much do we know and value these resources? Do we know where our marine protected areas are, why each was established, and why each is important? Do we understand why marine protected areas have zones, the rules and regulations for both fishing and tourism? Do we understand how these marine protected areas contribute to maintaining Belize's fishery? This Marine Protected Area Atlas answers these questions...

Over 190,000 (more than 50%) of Belizeans directly benefit economically from protection of Belize's reef



The reef provides a home to lobster, conch and many species of fish, important for Belize's commercial fishery

The reef supports more than 600 species of fish - some threatened, some only found in Belize

Income from tourism and fisheries supports more than 50% of Belizeans

The reef supports 2,750 fishermen and their families - over 12,500 Belizeans from 20 communities

70% of Belize's coastline is protected by coral reefs, breaking the force of ocean waves and saving lives and property

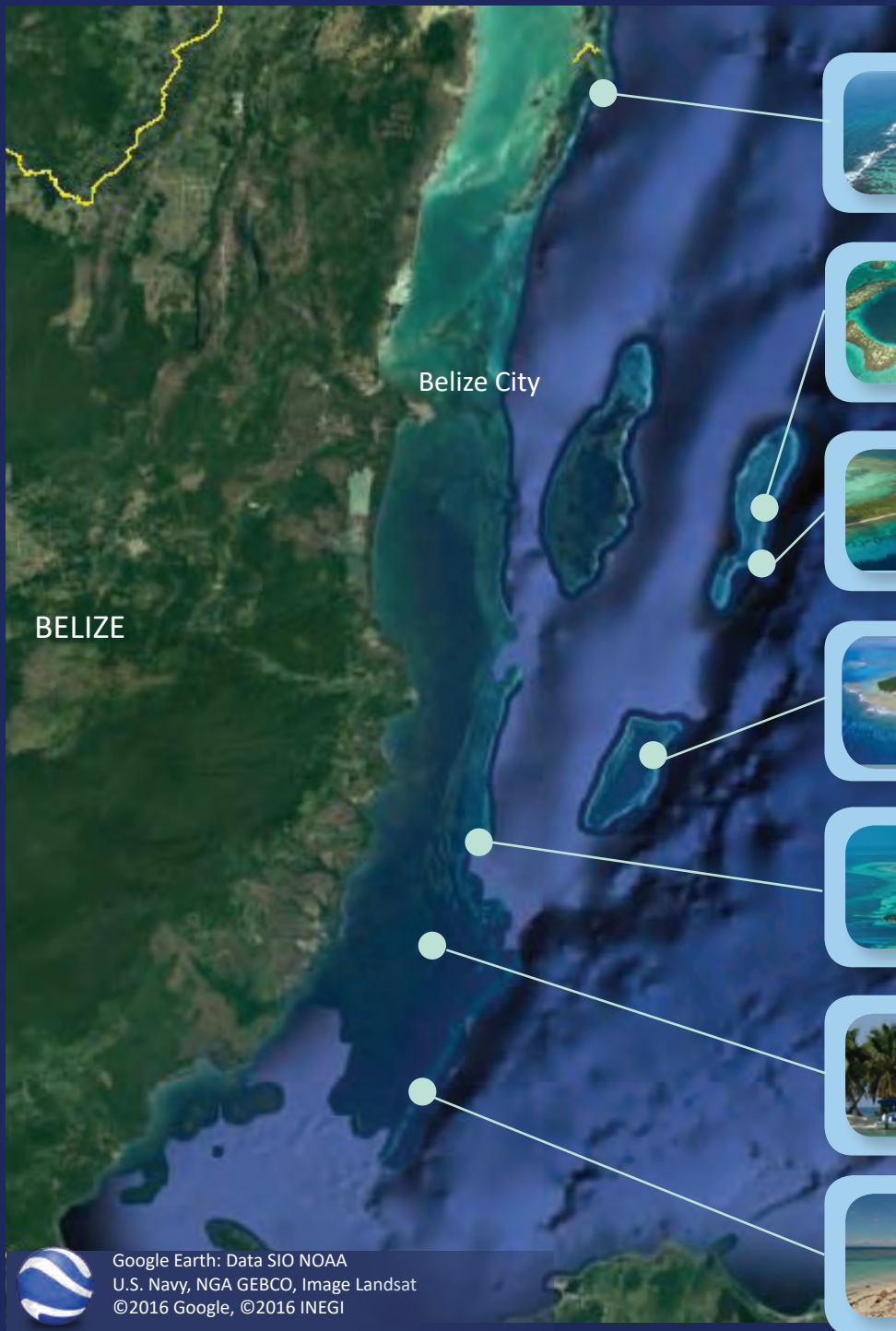
The reef protects Belize from storm surges and flooding - valued at over US\$120 million a year in avoided damages

The reef supports a flourishing tourism industry with more than 800,000 tourists coming to Belize each year to dive and snorkel

# Belize's World Heritage Site

## The Belize Barrier Reef Reserve System - World Heritage Site

Declared by the World Heritage Convention "...in recognition of the uniqueness of its contribution to Belize's reef system, the largest and possibly the least impacted reef complex in the Atlantic-Caribbean area."



**Belize City**

**BELIZE**

**Bacalar Chico National Park and Marine Reserve**

- Fisheries Department
- Forest Department
- Rocky Point, Barrier reef

**Blue Hole Natural Monument**

- Forest Department
- Belize Audubon Society
- Unique geological feature (sinkhole)

**Half Moon Caye Natural Monument**

- Forest Department
- Belize Audubon Society
- Pristine reef, Atoll formation

**Glovers Reef Marine Reserve**

- Fisheries Department
- Near-pristine reef
- Atoll Formation

**South Water Caye Marine Reserve**

- Fisheries Department
- Faros, barrier reef, pristine reef, oceanic mangroves

**Laughing Bird Caye National Park**

- Forest Department /
- Southern Environmental Association
- Near-pristine reef, faro

**Sapodilla Cayes Marine Reserve**

- Fisheries Department
- Pristine Reef
- Littoral forest on cayes

Google Earth: Data SIO NOAA  
U.S. Navy, NGA GEBCO, Image Landsat  
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**"It is our responsibility as a sovereign, free and independent country, to protect this site for future generations and manage it to minimize threats"**

*Nadia Bood, WWF, Belize*

# Belize's World Heritage Site

## The Belize Barrier Reef Reserve System

Belize's World Heritage Site was designated in 1996, and is composed of a series of seven protected areas, each significant for their high biodiversity, threatened species, productive ecosystems, unique geological formations, and natural beauty. Together, these represent the beauty of Belize's marine environment, its importance in supporting Belize's fishermen and tourism industry, and its intrinsic value for the people of Belize, as a recreational resource.

The System's seven sites illustrate the evolutionary history of reef development and provide critical habitats for threatened species, including marine turtles, manatees and the American marine crocodile.

### Belize Barrier Reef Reserve System – World Heritage Site

**Date of Inscription:** 1996

**Criteria:** (vii)(ix)(x)

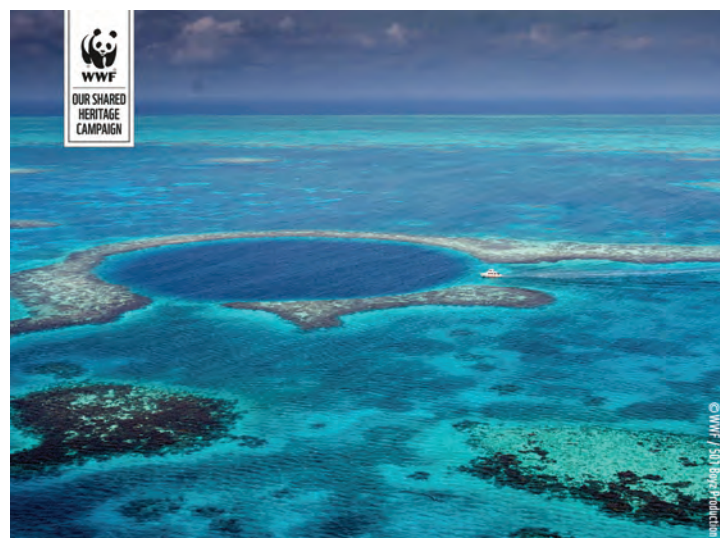
**Area:** 96,300 ha

**WHS Ref:** 764

*(vii) to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance*

*(ix) to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals*

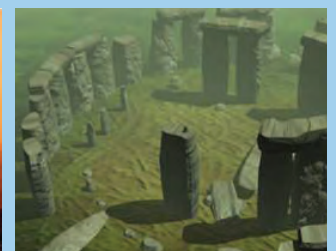
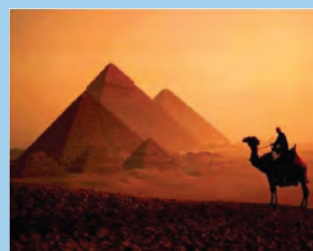
*(x) to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation*



### Quick Facts

#### What is a World Heritage Site?

- Heritage is our legacy – what we have received from the past, what we live with today, and what we pass on to future generations.
- Our cultural and natural heritage are both irreplaceable sources of life and inspiration. Places as unique and diverse as the Pyramids of Egypt, the ancient monuments of Stonehenge, and Belize's own barrier reef make up our world's heritage. These special places are given global protection under the World Heritage Convention.
- The World Heritage Convention is an international agreement under the United Nations Educational, Scientific and Cultural Organization (UNESCO). Under the World Heritage Convention, sites belong to all the peoples of the world, not only that of the country in which they are located.
- To be included on the World Heritage List, sites must be of outstanding universal value and meet strict criteria.
- Belize's World Heritage Site is currently listed as **"in danger"** as a result of three key potential and / or ongoing threats: offshore oil, mangrove clearance, and unsustainable development.



# River to Reef

The coastal waters and coral reef system in Belize are linked to the watersheds - the rain falling on the forests, savannas, and wetlands enters the streams and rivers, flowing from there into the sea. What happens on the land will affect the reef!

Any activity in the watersheds, whether forest clearance, fires, agricultural chemical use, poor garbage and sewage management, dams, gravel mining or coastal development, will have an impact on the water entering the rivers, affecting the health of the reef. The clearance of vegetation on the river banks and coastline increases erosion and the sediment load being carried out to the reef, affecting reef health.

To maintain a healthy reef, Belize also needs to maintain healthy watersheds and minimise the level of contamination entering the water. Improved pesticide and fertilizer management, and maintenance of the river bank and coastal vegetation, are practices that lead to better watershed management, and reduced impacts on the reef.



Maya Mountains	Coastal Plain	Reef Lagoon	Barrier Reef	Atoll (Glovers Reef)
Rain falls on the Maya Mountains and flows in streams and rivers to the coastal plain.	The rivers flow through the agricultural areas of the coastal plain and through communities to the sea.	The water reaches the coastal lagoon - the sheltered, shallow waters between the coast and the barrier reef. Here, patches of corals are scattered through seagrass beds and sand, with sand and mangrove cayes rising out of the water.	The barrier reef runs from north to south, a living wall, with the reef crest just below the water surface. This breaks the force of the waves, sheltering the area behind.	Beyond the barrier reef, the water depth increases to 1,000m. Underwater ridges run from north to south, supporting three atolls - each with a coral-fringed rim encircling a central lagoon.

## Definition: Ecosystem

A community of living organisms and their physical environment (water, sand and rock), interacting as a system.

Ecosystems have no particular size. An ecosystem can be as large as the Belize barrier reef, with its clear water, hard and soft corals, algae, sand, brightly coloured reef fish, sharks, turtles and sponges ...or as small as an empty conch shell, guarded by small wrasse, and supporting tube worms and algae on its outside.

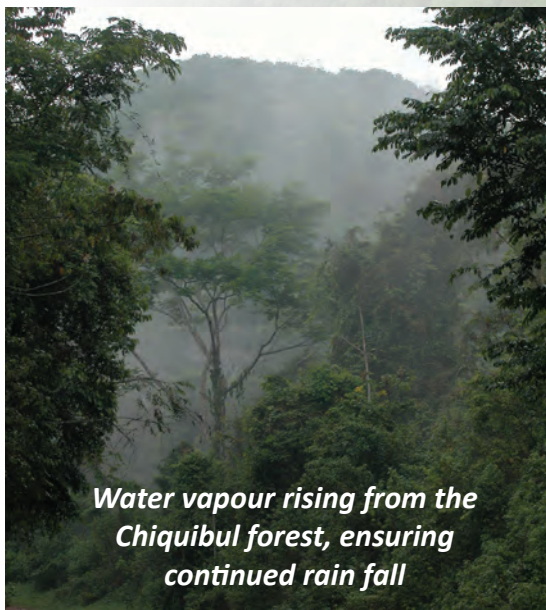
## Definition: Ecosystem Services

**Ecosystem Services are the benefits we receive from the natural environment.** This can be as simple as a continually renewing drinking water supply and the oxygen produced by forests - both critical for us to be able to survive. It is the aesthetic beauty that draws tourists to Belize, and the lobster, conch, and reef fish that provide food for the table, supporting coastal communities and provides the foundation for Belize's economy.

**Provisioning:** The products of ecosystem services such as food (meat and fish), medicinal plants, timber, firewood, energy and drinking water.

**Regulation and Maintenance:** The benefits of ecosystem services - such as nutrient cycles, oxygen production and crop pollination, regulation of climate, flood control, pest control, and disease.

**Cultural:** Spiritual and aesthetic values, educational opportunities, research, recreation and tourism.



*Water vapour rising from the Chiquibul forest, ensuring continued rain fall*

## How to keep our watersheds healthy

### ***Keep as much forest cover as possible:***

Forests help maintain rainfall. When forests are removed, rainfall is reduced, and becomes more unpredictable. Streams and rivers start to dry up. Good land use planning that balances clearance for agricultural land and maintenance of forest within the landscape will help maintain consistent rainfall.

### ***Maintain the 66 feet riverbank (riparian) vegetation:***

When riverbanks lose the trees and plants, the soil becomes less stable, and erosion increases, especially during storm events.

The riparian vegetation also filters the water running off the land, removing sediment and agro-chemicals. When the riverbanks are cleared, sediment and pollution are carried straight into the water when it rains, turning the clear water of rivers cloudy and introducing pollutants into the food chain.

Near the sea, the riparian vegetation gives way to mangroves. These play a similar role, filtering land-based pollution before it reaches the sea.

### ***Ensure garbage is disposed of correctly:***

Everything that goes into the river ends up in the sea - and this includes garbage. As well as being unsightly, this can cause harm to the environment when it is eaten by fish and other aquatic life. Always dispose of garbage correctly.

### ***Ensure septic systems work:***

Everything that goes into the river ends up in the sea - and this includes septic tank waste - or black water. This can increase the nutrient content, resulting in algal blooms causing green, stagnant water that cannot support life, often associated with large rafts of dead fish. Poor septic management, whether in individual houses or entire towns, can also introduce harmful bacteria into the water, causing disease.

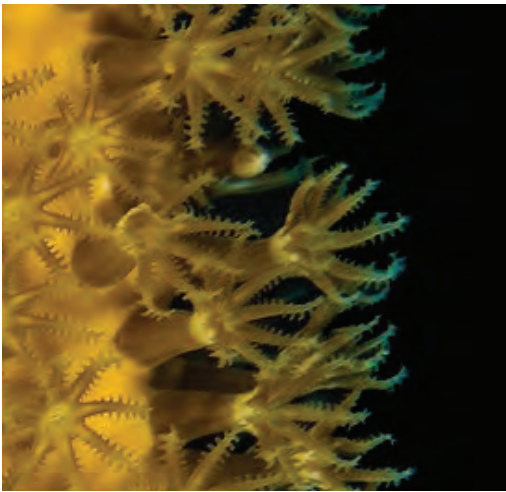
# Ecosystem Services of Belize's Coastal Waters and Reef

- Coral reefs, seagrass beds and mangroves are among the most productive habitats, and provide ecosystems necessary for different life stages of commercial and non-commercial marine species
  - Coral reefs, seagrass and mangroves play an important role in the cycling of nutrients
  - Seagrass is effective as a carbon dioxide (CO<sub>2</sub>) sink, removing excess carbon dioxide from the atmosphere, contributing to climate change mitigation
  - Mangroves provide nesting structure for bird nesting colonies, as well as the osprey, an important top predator
  - Coastal (littoral) forest provides important stop-over habitat for migratory bird species
- 
- The barrier reef provides the first line of protection for the Belize coastline from storm surges and oceanic waves, preventing erosion of the coastline - the barrier reef reduced wave energy by an average of 97%
  - The reefs of Belize support corals, which break down to form sand, a major component in the formation of beaches and cayes
  - The prop roots of red mangroves provide the second line of protection for the cayes and coastline against erosion
  - Seagrass plays an important role in stabilizing the mud and sand sea floor, filtering and settling turbidity in the water
- 
- The coral reefs provide structure and habitat for fish and lobster to ensure that there are viable populations of commercial species for subsistence and commercial fishing
  - Mangrove and seagrass provide important nursery areas for both commercial and non-commercial species
  - Sand beaches provide nesting areas for marine turtles
  - Spawning aggregation sites, located on the reef walls, are important for recruitment of many commercial species (especially snapper and grouper)
- 
- The reef and seagrass has been an important traditional commercial fishing ground for the Belize fisheries industry – particularly for lobster and conch
  - Subsistence fishermen from coastal communities across Belize rely on fish to provide protein for their families and communities
  - The reef is a critically important resource for tourism and recreation, providing jobs and income for coastal and cayes communities
  - Cultural ties and aesthetic appreciation of the sea and its scenic beauty are strong in coastal communities in Belize

## Quick Facts:

### What is Coral?

- Coral is a living animal - an invertebrate (an animal without a backbone).
- Coral is formed by many thousands of small individual organisms - “polyps” - living together in a colony.
- Each polyp has a central mouth ringed by tentacles, leading to a bag-like stomach.



- Each polyp also produces a hard, stone-like outer layer - an “exoskeleton” that protects it, and cements it to the rest of the colony.
- Polyp colonies form distinctive shapes - elkhorn polyps always form elkhorn coral, black coral polyps always form black coral, and sea fan polyps always form sea fans.
- As polyps die, new polyps form on top of them, fastened to the old exoskeletons, gradually increasing the size of the colony.

# Coral Reefs

Belize falls within the Western Caribbean, considered one of ten coral reef hotspots of the world. It is a significant part of the largest barrier reef in the western hemisphere - the Mesoamerican Reef, running north-south, parallel to the coast. It encompasses some of the richest marine life - a valuable resource for traditional fishing communities and Belize’s marine-based tourism industry.

### Reef Building Corals - Why are they important?

Reef building corals are the larger hard corals that, together, form the reef structure - whether a patch reef, part of the barrier reef, or the walls of an atoll. These corals are very important as they:

- break the strength of the waves approaching the coastline, reducing erosion of the beaches and protecting the coast and cayes.
- provide homes for many reef organisms - including the lobster, snapper and grouper that support the fishing industry.
- contribute towards Belize’s primary industry - tourism. The beauty of the reef and its inhabitants bring over one million international visitors to Belize each year.
- are part of Belize’s natural heritage, for the enjoyment of Belize’s people.



Rachel Graham / MarAlliance

# How healthy are our reefs?

The Belize Reef has been affected by several large-scale natural disturbances in the last fifty years, both natural and man-made. Most recently, by the die-off of the long-spined sea urchin and over-fishing of key parrotfish species - both important in the maintenance of healthy reefs. In 1983, the near-extinction of staghorn and elkhorn corals - two of the primary reef-building species.

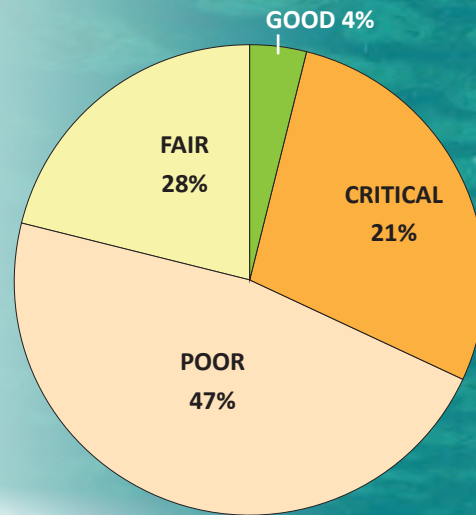
In 1998, a catastrophic coral bleaching event spread throughout the reef, caused by increasing water temperatures. The bleaching reduced the health of the corals, making them more susceptible to disease, and resulting in increased coral death. Diseases have also been linked to elevated nutrients (especially from sewage), sedimentation and runoff. Corals seem to be more prone to disease when affected by other stressors.

Since then, bleaching has become more frequent, though bleaching events have not been as widespread as in 1998.

## What is Coral Bleaching?

Corals are highly sensitive to changes in water temperature - increases of only 1°C can have potentially lethal effects. High water temperature events in the MAR region have resulted in several large-scale bleaching events (e.g., in 1995, 1998 and 2005) causing significant coral mortality in some areas.

Increased global sea surface temperature is widely believed to be caused by human-induced global warming



**Healthy Reefs 2015  
Report Card for Belize**  
The Belize Reef averaged 2.5 out of 5 in 2015. Of 94 sites in Belize, only 4% can be considered GOOD, based on the status of coral cover, macroalgal cover, and biomass of herbivorous and commercial fish

[www.healthyreefs.com](http://www.healthyreefs.com)

# Keeping Reefs Healthy

## The Critical Role of The Parrotfish and Other Herbivores

Sea urchins and herbivorous fish – such as the parrotfish and surgeonfish - are important for the maintenance of the health of the reef. They are the dominant grazers of the reef, keeping algal growth under control. They are critical in maintaining the balance between live coral reef and algal cover, ensuring coral recruitment sites are available for continued coral health and growth, particularly important following bleaching episodes, when healthy coral recovery and growth is critical.



## DID YOU KNOW?

The laws of Belize protect parrotfish in recognition of their importance in maintaining the health of the reef - and therefore the health of Belize's fishing and tourism industries

Fish fillet is required to have a skin patch that identifies the fish, ensuring that it is not a parrotfish - a protected species.



## THE STOPLIGHT PARROTFISH

One of the larger, brightly coloured fish of the reef, the Stoplight Parrotfish is protected in Belize, in recognition of its critical role in maintaining healthy reefs.

## THE IMPORTANCE OF CONNECTIVITY

Healthy reefs rely on the proximity of mangroves, seagrass and corals. Where all three ecosystems are found close together, the reefs are generally considered to be healthier. Belize's coastal waters encompass the offshore mangroves, extensive seagrass beds and coral reef. The coastal lagoon has interconnected seagrass beds and mangrove-lined cayes that provide essential connectivity for maintenance of the exceptionally diverse marine life. Many marine organisms, including fish and lobster, migrate from the reef to the mangroves and seagrass at different stages of their development. One of the greatest human-based threat to this connectivity, and therefore to the continued health of the reefs, is the removal of mangroves, particularly on the Atolls, where the extent of mangroves is limited.



# Mangroves

Mangroves are found primarily on the coastal areas of the mainland and the cayes. Mangrove ecosystems range from the extensive stretches of inundated dwarf mangroves found throughout shallow, coastal lagoons to the tall mangroves that line the lower reaches of the rivers, and the hardy fringing mangroves that line the coastline and cayes.

These mangroves are critically important in the protection of coastlines and cayes, and protect the lives and property of the people of Belize in times of hurricanes. They also play an important role in the fisheries sector, providing critical nursery areas for many commercial and sport fishing species.

Mangrove cayes are important for supporting nesting colonies of waterbirds - reddish egrets, roseate spoonbills, wood storks and white ibis. These birds feed in wetlands

such as Crooked Tree, bringing bird-based tourism to Belize. Seabirds - magnificent frigatebirds, red-footed boobies and brown pelicans - also rely on these mangrove cayes for nesting.



**Mangrove cayes** provide safe nesting sites for colony nesting birds

**Red Mangrove** roots provide shelter - important nursery areas for juvenile fish



# PROTECTION...FILTRATION

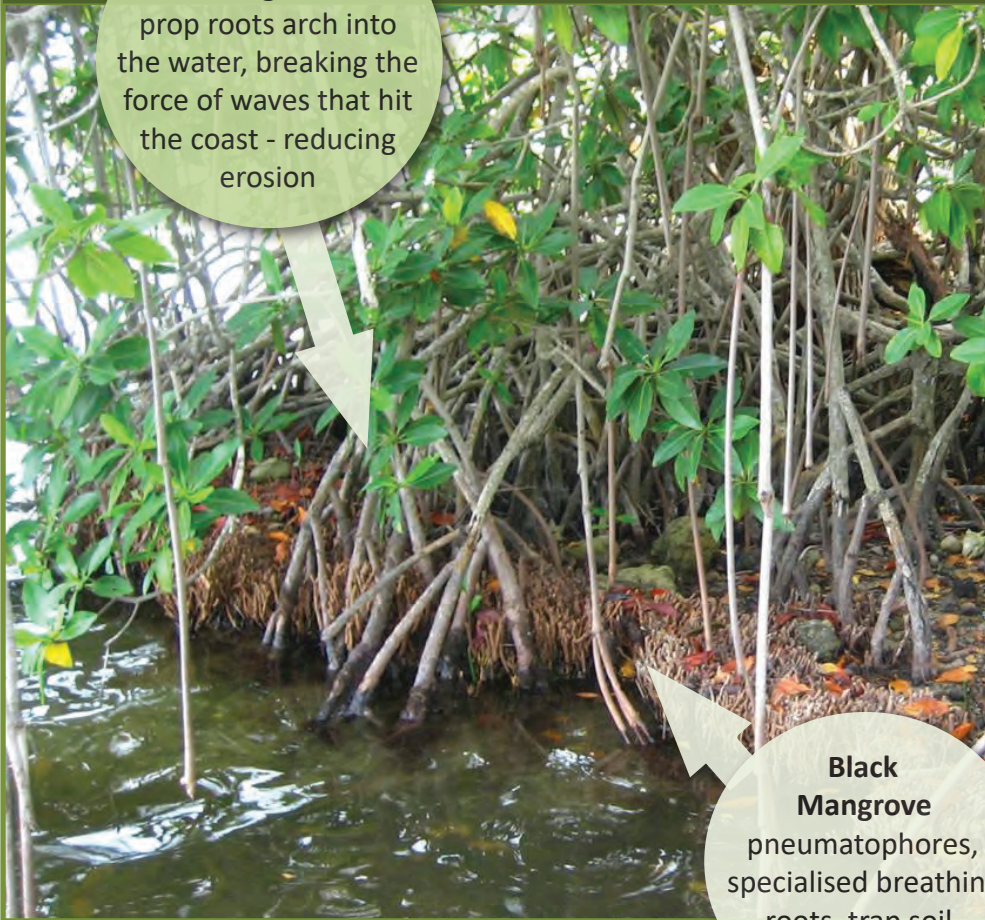
## QUICK FACTS

### Why are mangroves important?

- Mangroves protect the shoreline from erosion, breaking the strength of waves.
- Mangrove roots provide a sheltered nursery area for many marine organisms, including lobster and commercial fish species, assisting in maintaining the health of the reef, and of Belize's fishery.
- Mangroves filter out excess nutrients, sediments and contaminants before water reaches the sea.
- Healthy coastal mangrove protects life and property against storm damage, acting as a buffer from hurricane winds.
- Mangroves help create land by trapping sediment behind red mangrove prop roots and black mangrove pneumatophores.

### Red Mangrove

prop roots arch into the water, breaking the force of waves that hit the coast - reducing erosion



### Black Mangrove

pneumatophores, specialised breathing roots, trap soil, creating land

## KNOW YOUR MANGROVES



**Red Mangrove**  
 Large, wide, pointed, waxy leaves  
 Grows closest to the water  
 Prop roots arch into the water  
 Produce long, green, pencil-shaped propagules - germinated seeds that float in the water

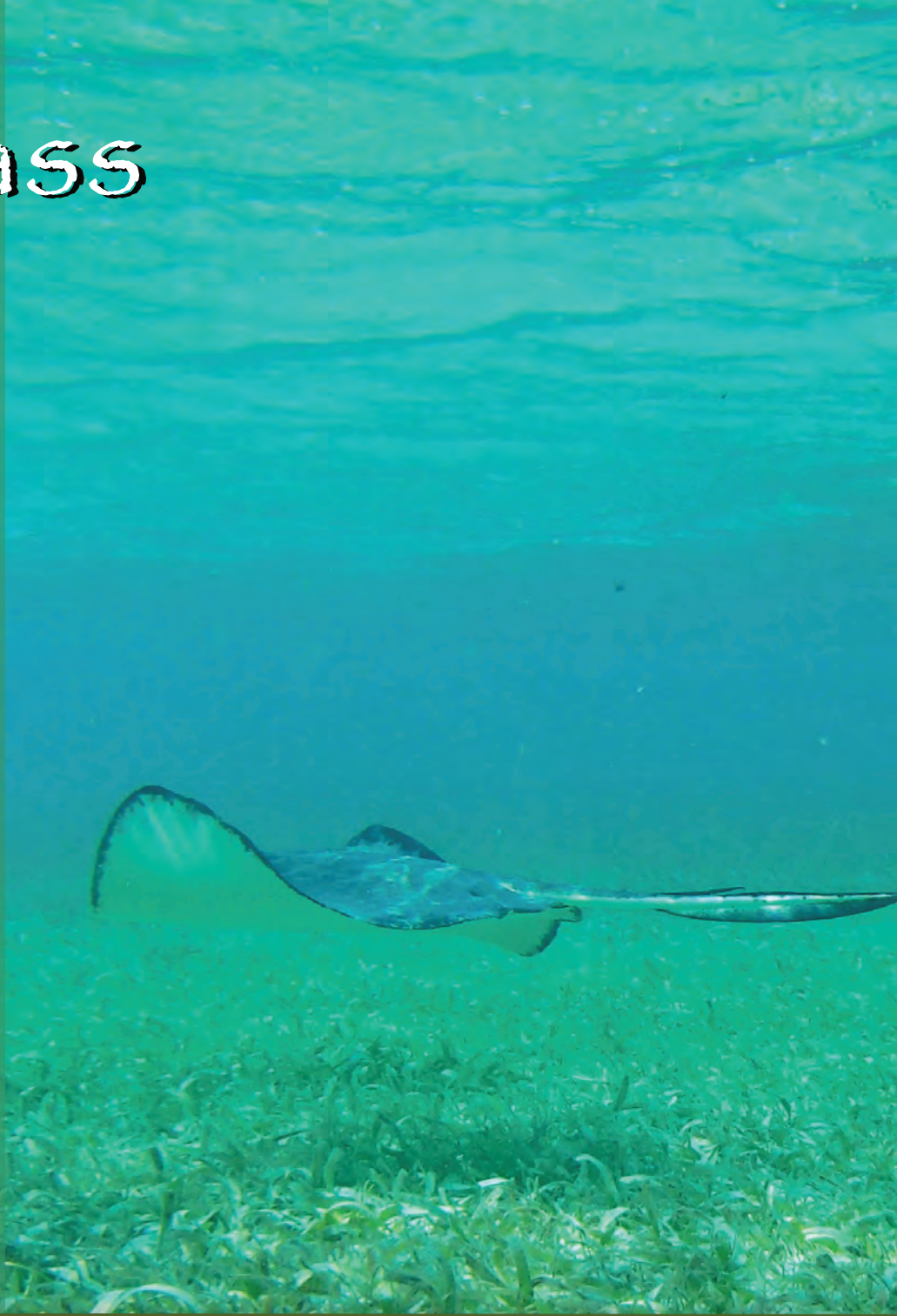
**Black Mangrove**  
 Longer, thinner leaves  
 Grows behind the red mangrove  
 Has pneumatophores - finger like projections that grow upwards from the roots, helping the tree to breathe, and stabilizing the coastline

**White Mangrove**  
 Leaves are rounded, and notched at the end.  
 Leaves have two small glands at the base  
 Grows further back from the water's edge, in less waterlogged soils and has a small number of pneumatophores.

**Button Mangrove**  
 A mangrove associate.  
 Leaves are long, thin and pointed.  
 Leaves have two small glands at the base.  
 Fruit are small and round.

# Seagrass

Seagrass forms an important, highly productive ecosystem in shallow waters, supporting the traditional fishing industry and providing nurseries, shelter and food for many commercially, recreationally and ecologically important species. These include conch, fish, manatees, sea turtles, seahorses and crustaceans.



Alysha McGrattan

## How many types of seagrass are found in Belize?

Most people are familiar with the common seagrass in Belize's waters, the turtlegrass (*Thalassia testudinum*), which covers large stretches of the shallow sea floor. However, Belize has more than one type of seagrass growing in its shallow coastal waters and lagoons. These include:

- the cylindrical manatee grass (*Syringodium filiforme*)
- the short shoal grass (*Halodule wrightii*)
- paddle grass (*Halophila decipiens*)
- widgeon grass (*Ruppia maritima*)
- the globally vulnerable star grass (*Halophila baillonii*), known from Placencia Lagoon
- the flat bladed turtlegrass (*Thalassia testudinum*)

## Quick Facts

### Why is seagrass important?

- Seagrass provides food and shelter for many marine organisms, including conch - an important commercial species.
- Seagrass stabilizes the seabed, improving the water clarity.
- Seagrass filters out sediments and pollution - excess nutrients and contaminants.
- Healthy seagrass is important for maintaining healthy reefs. It provides habitat for juvenile parrotfish, important herbivores that keep the reef clean.

### DID YOU KNOW

A density of 88 conch per hectare is considered necessary for a sustainable population. Below this, these slow moving snails have problems finding each other, reducing their chances of reproducing.

## MARINE RESERVE CONSERVATION ZONES - KEY REPLENISHMENT AREAS FOR QUEEN CONCH

The Queen conch (*Lobatus gigas* (known previously as *Strombus gigas*) relies on healthy expanses of seagrass, grazing algae and other marine plants growing on the seagrass leaves. Conch is fished extensively throughout Belize and is an important contributor to fisheries exports. The shallow, protected waters of the seagrass beds and back reef flats are important as conch nursery areas, supporting fishermen throughout Belize.

The presence of patrols in marine protected areas prevents illegal incursions by fishermen, and results in a higher density of conch inside the boundaries. As they grow, these conch then disperse outwards, where they can be fished. This ensures continued sustainable extraction for the fishermen - as much a goal as conservation of the conch itself.



Turtlegrass



Manatee grass



Shoal grass



Paddle grass



Widgeon grass

# Threatened Species

## What do we mean by Threatened Species?

**A Threatened Species is one that is declining - the number of individuals is going down.**

This may be because of disease or the changing climate...but more frequently, it is because of us. Unsustainable hunting and fishing reduce numbers until the populations are so low, they find it hard to recover. These species may then become extinct.

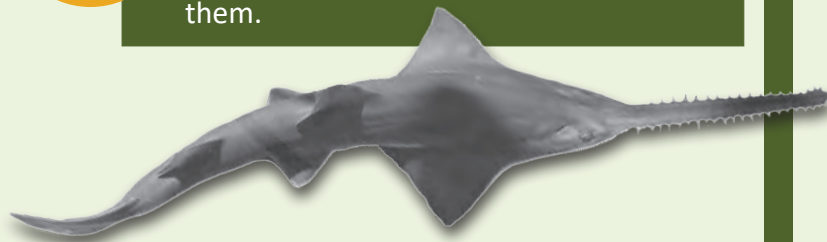
The International Union for the Conservation of Nature (IUCN) has developed a series of global categories that indicate which species are at most risk of extinction.

**EX** **EXTINCT**  
There are no more living examples of these species left on Earth - our children will never be able to see these in the wild - **EVER**.

**CR** **CRITICALLY ENDANGERED**  
These species will become extinct in the near future unless we work harder to protect them.

**EN** **ENDANGERED**  
These species are declining fast, and are at risk of becoming critically endangered in the near future unless we work hard to protect them.

**VU** **VULNERABLE**  
These species are declining but not yet endangered. However they will continue to decline unless we work to protect them.



THREATENED SPECIES OF BELIZE'S REEF	
<b>CRITICALLY ENDANGERED</b>	
Staghorn Coral	<i>Acropora cervicornis</i>
Elkhorn Coral	<i>Acropora palmata</i>
Goliath Grouper	<i>Epinephelus itajara</i>
Hawksbill Turtle	<i>Eretmochelys imbricata</i>
Smalltooth Sawfish*	<i>Pristis pectinata</i>
Largetooth Sawfish*	<i>Pristis perotteti</i>
*Possibly no longer in Belize	
<b>ENDANGERED</b>	
Loggerhead Turtle	<i>Caretta caretta</i>
Green Turtle	<i>Chelonia mydas</i>
Nassau Grouper	<i>Epinephelus striatus</i>
Social Wrasse	<i>Haliichoeres socialis</i>
Fire Coral	<i>Millepora striata</i>
Splendid Toadfish	<i>Sanopus splendidus</i>
Whale Shark	<i>Rhincodon typus</i>
Boulder Star Coral	<i>Montastraea annularis</i>
Star Coral	<i>Orbicella faveolata</i>
Great Hammerhead	<i>Sphyrna mokarran</i>
Scalloped Hammerhead	<i>Sphyrna lewini</i>
IUCN, 2016	

## Have any species gone extinct in Belize?

In the last 30 years, Belize is thought to have lost at least two species - the largetooth and smalltooth sawfish. These were once common in shallow coastal waters and lagoons. The introduction of gillnets led to over-fishing and now, only occasional reports of individual sawfish after flood events suggest there may still be a small remnant population left in northern Belize. However, these individuals have not been verified and there is no photographic evidence to prove that this species still exists in Belize.



R. Graham

**CR****ELKHORN AND STAGHORN CORALS**Elkhorn Coral (*Acropora palmata*)Staghorn Coral (*Acropora cervicornis*)**Status: CRITICALLY ENDANGERED.**

These were once two of the most common coral species of the Caribbean reef. However, these species are particularly susceptible to white band disease, coral bleaching and storm damage. Since 1980, an estimated 90-95% of elkhorn and staghorn corals have been lost.

**Importance:** Two of the most important reef building corals of the reef, critical as part of the reef crest structure, protecting the cayes and coastal areas by breaking the force of the oceanic waves and limiting storm surges.

**Threats:**

**Human threats:** Land-based water contamination (primarily agricultural herbicides and pesticides, sedimentation), fishing of herbivorous fish species, unsustainable coastal development and poor tourism practices.

**Climate change impacts:** Increasing water temperature, rising sea level, ocean acidification and increasingly strong tropical storms.

**CR****HAWKSBILL TURTLE***Eretmochelys imbricata***Status: CRITICALLY ENDANGERED**

Hawksbill turtles have been hunted throughout their range for their meat and shells.

**Importance:** Hawksbill turtles feed on sponges that grown on the reef, helping to ensure that there is space for coral growth - maintaining the balance required for a healthy reef.

**Threats:**

**Human threats:** Coastal / caye development - removal of natural beach vegetation on key nesting beaches, illegal fishing / trans-boundary fishing of this species (it is protected under Belize law)

**Climate Change impacts:** The sex of turtle hatchlings is determined by the temperature of the air and sand around the nest - higher temperatures will produce a shift towards female hatchlings.

With rising sea levels, there will be increased flooding of nests and loss of nesting beaches.

**CR****GOLIATH GROUPE***Epinephelus itajara***Status: CRITICALLY ENDANGERED**

Goliath grouper, better known in Belize as "jewfish" or "cherna", has been reduced by as much as 80% across its range. In Belize, it has become rare in areas where it was once common - populations consist primarily of small juveniles, with very few large fish now being seen.

**Importance:** The Goliath grouper has traditionally been a key commercial finfish species for coastal communities throughout Belize. It can reach a length of 8 feet (2.5 m) / 700 pounds (320 kg) - providing a significant income for a fisherman.

**Threats:**

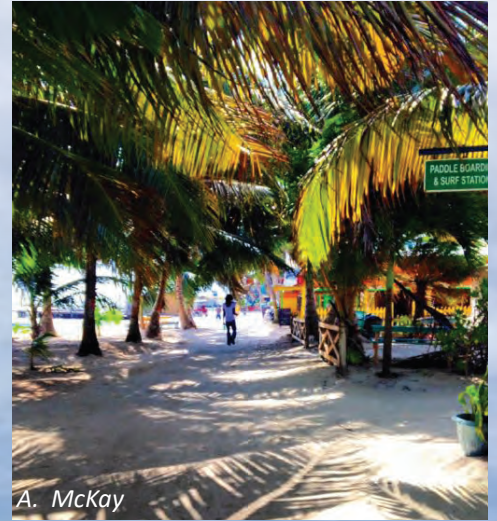
**Human threats:** Unsustainable fishing and clearance of mangrove nursery areas for coastal development.

**Climate Change Impacts:** Warmer seas and potential shifts in currents may affect population replenishment.

# Coastal Communities

Coastal communities in Belize range from the commercial centre of Belize City to the small coastal villages of Hopkins, Seine Bight and Monkey River. Whilst the majority of these communities were historically supported by fishing, many of the caye, central and southern coastal communities have now successfully switched to tourism. San Pedro, Caye Caulker and Placencia are key tourism destinations for marine-based tourism.

In communities with poor access, such as Sarteneja and Monkey River, diversification into tourism is more difficult, and the communities still have a higher reliance on fishing.



A. McKay



**Belize City**, with a population of 31,490 people (2015 estimate, CSO) is the largest settlement in Belize. It is located on Haulover Creek, a tributary of the Belize River, facing the Caribbean Sea. Belize City was established in 1638 on the site of a previous Maya settlement. It was a strategic location in the early days of the logging industry, with logs floated down-river for shipment from the town, and provided a deep water sheltered harbour for ships trading with Belize.

This is still true today, with one of Belize's two large ports located in Belize City. While not the capital city, it still remains the commercial centre, with many businesses based here. However, even though it is protected by the barrier reef and cayes to the east of it, it is vulnerable to tropical storms and flooding.

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## DID YOU KNOW

Over 35% of Belize's population lives in more than 23 coastal communities on the coast or on the cayes (CZMAI, 2008).

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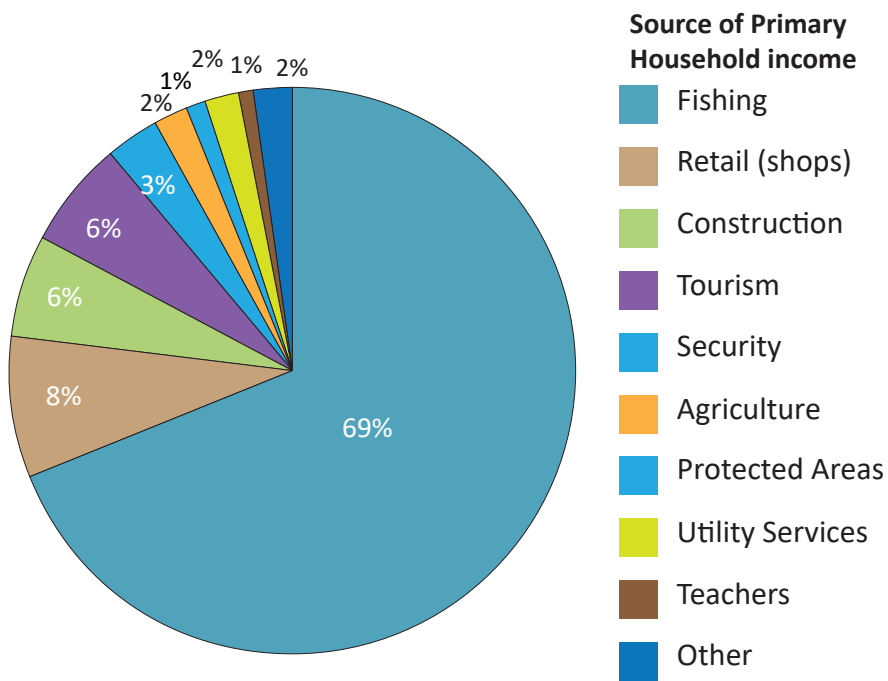
## FISHING BOATS OF THE SARTENEJA FISHING FLEET

The sailboats of Sarteneja are built in the community, and have been used for lobster and conch fishing since the start of the industry. Each boat is home for as many as twelve fishermen, and sometimes more, for fishing trips that can last as long as ten days.

The boats sail from Belize City during the fishing season, then brought back to Sarteneja for maintenance when the lobster season closes.



## Living in a Fishing Community



With fishing as the primary income source in Sarteneja, there is high community and households reliance on fishing (SACD survey, 2015).

Coastal communities that haven't yet developed significant tourism are highly vulnerable to changes in the fishery. Households that are not directly dependent on fishing (such as shop keepers (retail) and construction workers) are still dependent on the economic health of the community, tied to the fishery.

# Commercial Fishing in Belize

**The fishing industry has strong traditional roots, and is focused on the shallow waters between the coast and the barrier reef, and on the three offshore atolls. It is both socially and economically important to Belize, with more than 2,750 fishermen directly dependent on capture fisheries, supporting an estimated 12,500 Belizeans from 20 communities, and a further 1,000 people involved indirectly in processing and export.**

The most important commercial species are Caribbean spiny lobster, Queen conch and finfish (primarily snapper and grouper), with sea cucumber as a relatively new extractive industry. Fishermen fish independently, using open skiffs, sail boats and canoes, either free-diving for lobster and conch, using lobster traps and shades, or fishing by hook and line. An estimated 90 to 95% of the conch, lobster and fish caught are sold to four fishing cooperatives, two of which then export to the United States and Europe. The remaining 10% is marketed in Belize, supplying homes, restaurants and hotels.

Economic dependence on traditional commercial fishing is high, particularly in the northern coastal communities, where limited options exist for diversification into other livelihoods. Fishing is highly dependent on the health of the reef - which is facing multiple pressures, particularly from land-based threats such as pollution, as well as increasing tourism impacts, rising sea temperatures and ocean acidification. A historical increase in the number of fishermen, unsustainable fishing practices (including incursions by fishermen from other countries, illegal fishing of parrotfish and of under-sized, out-of-season lobster and conch) have also affected the reef health.

Belize is implementing a rights-based Managed Access system across the coastal waters to improve sustainability, and is improving environmental regulations that set agricultural and aquaculture industry standards.

***...2,750 fishermen directly dependent on fishing, supporting an estimated 12,500 Belizeans from 20 communities, and a further 1,000 people involved indirectly in processing and export...***



24L. Tamai



A. Ramirez



Central and southern Belize fishermen combine free diving for lobster and conch at the start of the open seasons with the use of lobster and fish traps, and hook and line / long lines for targeting finfish. Access to the fishing area is generally by 15-25 ft fiberglass skiff or by wooden canoe, and starts early in the morning, with fishermen returning home with their catch to sell at the local fish market or to the local fishing cooperatives.

When fishing grounds are more distant, such as at Glover's Reef or Turneffe Atoll, fishermen have established fishing camps. These provide a base from which to fish each day, using hand lines and long lines for finfish, for sale principally in Belize City (Vernon Street), and complementing this with lobster fishing using lobster traps and shades.

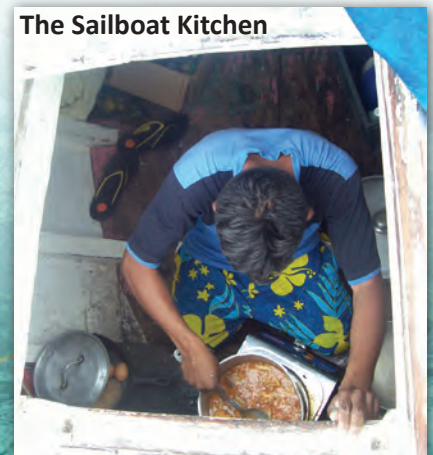
A. Ramirez



"I have always been a fisherman - but it is hard. Years ago you could see a lot of fish, a lot of lobster a lot of conch - but comparing those years to now, things are really really bad. Some days you can stand with just one lobster, two conchs...and that means that everything is decreasing - year after year."

Hilmar Salazar, Fisherman

The northern sailboat fishermen leave on the early morning bus from Sarteneja, Chunox or Copper Bank, heading for Belize City, where the sailboats are based during the fishing season. The large, central ice box is filled, food and water is loaded, and the boat sets sail for the fishing ground. The boats go out for six to ten days at a time, with an average of eight to ten fishermen aboard, each free diving for lobster and conch from their own canoes, then returning to the sailboat to clean the product and place it in the ice box.



L. Tamai



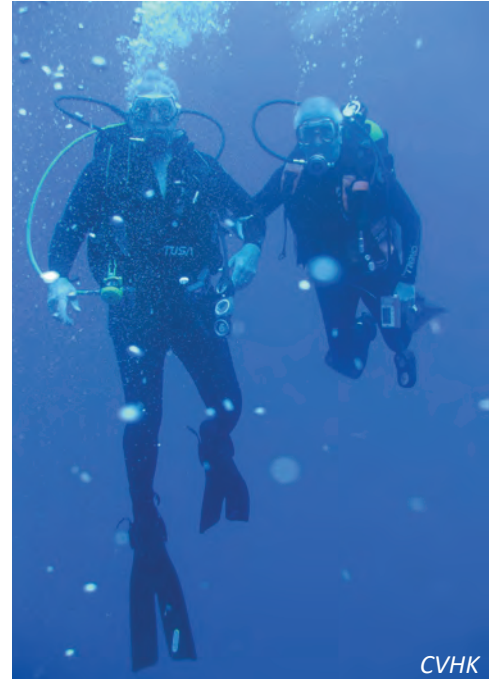
K. Dyke

# The Marine-based Tourism Industry

Tourism is one of Belize's most important industries, providing employment for tour guides, tour operators, hotels and restaurants across the country, and supporting more than 25% of Belize's population.

Tourism is focused primarily on the Belize reef - an experience that is alive with colour and movement, and provides some of the best snorkelling and diving in the Caribbean. Relaxing on beaches and enjoying the scenic beauty of the cayes, kayaking in the sheltered, crystal clear waters of the atolls, sailing along the reef on a converted, hand-crafted wooden fishing boat, or on a luxury live-aboard yacht - Belize has something to suit everyone, bringing tourism investment and tourism income to the national and local economies.

Where tourism has taken off, coastal communities have expanded from once sleepy fishing villages to bustling tourism centres. San Pedro, Caye Caulker and Placencia all attract workers from elsewhere in Belize, with employment opportunities in restaurants and hotels, as guides and in construction. In southern and western inland Belize, it is not uncommon for families to have members who "work out" - who spend two weeks or more at a time in a tourism-related jobs in one of these communities, to provide an income for their families. In this way, the benefits of coastal tourism trickle down to even the most land-bound of inland communities.



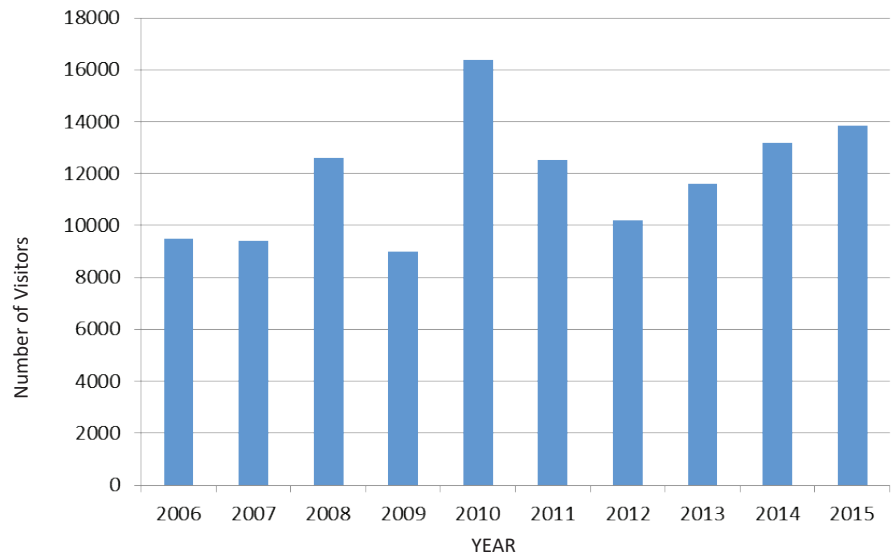
CVHK



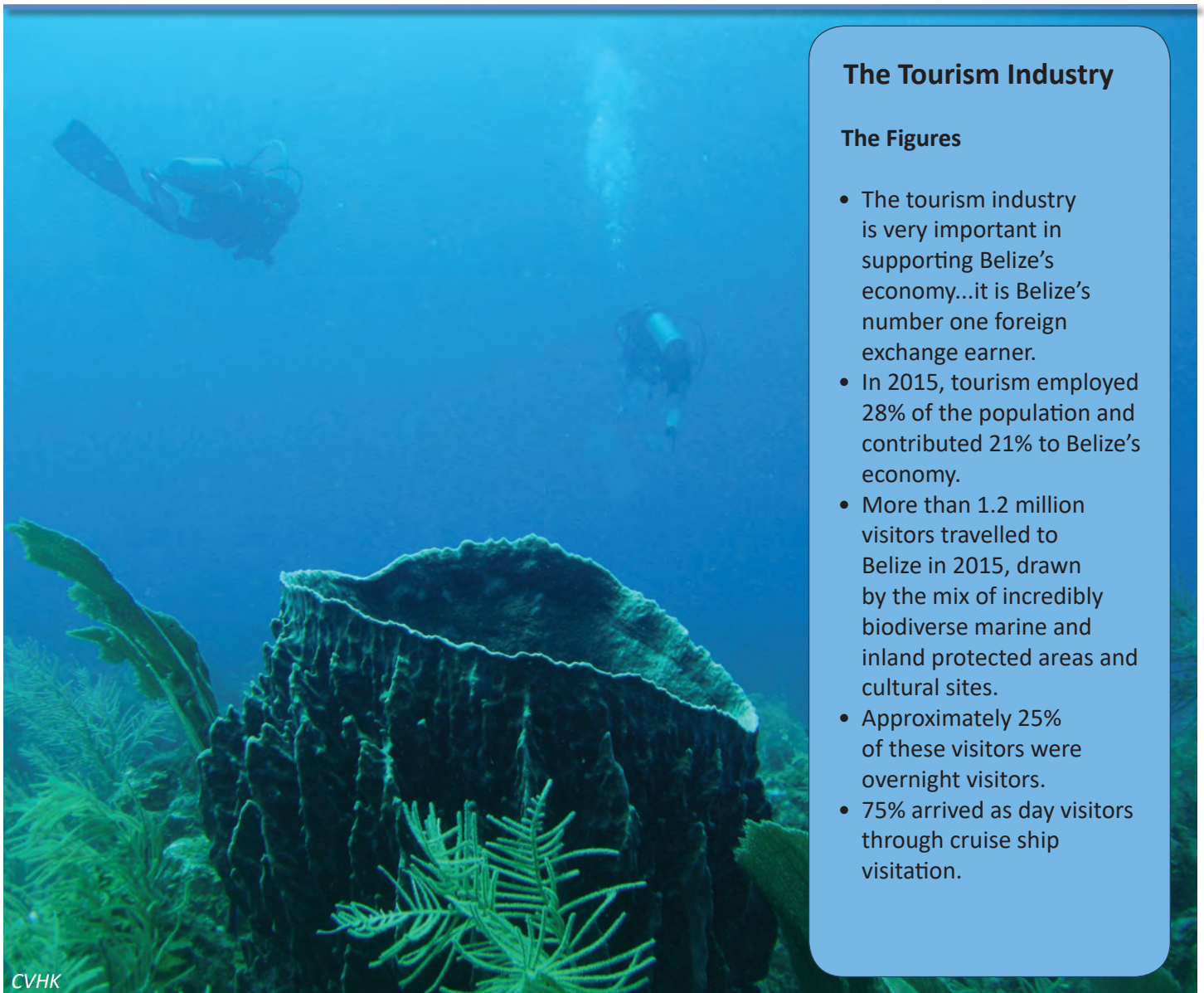
## Visitation - Half Moon Caye and Blue Hole Natural Monuments

Half Moon Caye and Blue Hole Natural Monuments play an important role in bringing tourism to Belize, with significant tourism-based stakeholder interests in the Atoll. Visitation to Half Moon Caye and Blue Hole has fluctuated over recent years. In 2014, visitation was reported at 13,178 (BAS, 2015).

These are only two of the many important marine protected areas that support tourism in Belize.



Annual Visitation to Blue Hole and Half Moon Caye Natural Monuments (BAS, 2016)



### The Tourism Industry

#### The Figures

- The tourism industry is very important in supporting Belize's economy...it is Belize's number one foreign exchange earner.
- In 2015, tourism employed 28% of the population and contributed 21% to Belize's economy.
- More than 1.2 million visitors travelled to Belize in 2015, drawn by the mix of incredibly biodiverse marine and inland protected areas and cultural sites.
- Approximately 25% of these visitors were overnight visitors.
- 75% arrived as day visitors through cruise ship visitation.

# Sport Fishing

Bonefish, permit and tarpon, if caught in the same day, qualify as a 'Grand Slam', the ultimate achievement for sport fishermen, and one that can only be fulfilled in a limited number of places around the world - Belize is one of those places. Belize has built a solid reputation for hosting Grand Slam opportunities, from the Sapodilla Cayes to Turneffe Atoll and Glover's Reef Atoll, and northwards to the Northern Belize Coastal Complex. A number of high-end resorts promote all inclusive sport fishing packages, and sport fishing guides are in high demand. The majority of anglers are 'catch and release' fly fishermen, using reef flats sheltered behind the barrier reef.

Sport fishing for bonefish, permit and tarpon has become of increasing importance over the years in its contribution towards the tourism sector. In 2007, it accounted for more than Bz\$25 million in direct expenditures into Belize's economy - approximately 6.3% of the national expenditure. It also provides a wide range of direct and supporting employment opportunities, valuable in particular for traditional fishermen seeking to shift away from the declining commercial fishery into an alternative income base.

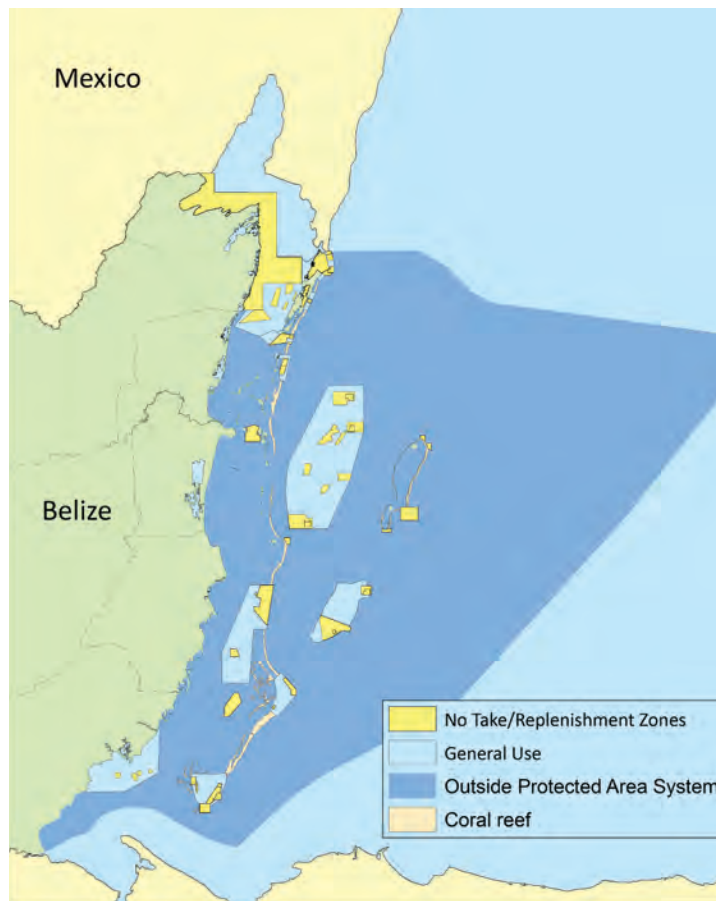


# The Belize Marine Protected Areas Atlas



# Belize's Marine Protected Areas System

Belize has rich coastal waters that are important in supporting communities and individual livelihoods. Much of the sea is open to fishing, as long as fishermen have a valid fishing license for that area. Some areas have been designated as marine protected areas to help ensure that fishing remains sustainable, and to protect key areas that are important for maintaining fish populations, key species, or key tourism resources.



## National Park

- One National Park - Laughing Bird Caye National Park
- Managed under the Forest Department
- Established to protect a tourism resource
- Does not permit commercial fishing

## Natural Monuments:

- Two Natural Monuments - the Blue Hole and Half Moon Caye Natural Monuments
- Managed under the Forest Department
- Established to protect nationally important sites
- Do not permit fishing or other extractive activities

Belize has fourteen marine protected areas spread throughout its coastal waters, managed under four different categories:

## Marine Reserves:

- Nine Marine Reserves.
- Managed under the Fisheries Department as an important fisheries management tool.
- Fishing is permitted in the General Use Zone, but gear regulations are generally in place (for example, no spear guns, no nets), and surveillance and enforcement patrols are active.
- Conservation Zones and Preservation Zones protect high value areas such as spawning aggregation sites or fish nursery areas - no take replenishment zones.
- No commercial fishing is permitted in these areas.
- Only 3% of Belize's waters are protected as replenishment (no-take) areas. Fishing is permitted everywhere else.

## Wildlife Sanctuaries:

- Two Wildlife Sanctuaries.
- Corozal Bay Wildlife Sanctuary and Swallow Caye Wildlife Sanctuary.
- Managed under the Forest Department.
- Established to protect two key manatee areas.
- Do not permit commercial fishing.  
- however the revised National Protected Areas System Act allows for re-categorizing as a Wildlife Sanctuary (2), with fishing permitted in areas where fishers have traditionally relied on the marine resources, if supported by a sustainable fishery plan.

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**The Protected Areas System also includes 11 Spawning Aggregation Sites - sites on the reef drop off where snapper, grouper and other important commercial species congregate to spawn.**

# Managing for the future...



L. Tamai

## MARINE PROTECTED AREAS

PROTECTED AREA	MANAGEMENT / CO-MANAGEMENT AGENCY	YEAR ESTABLISHED	AREA (ACRES)
Bacalar Chico Marine Reserve	Fisheries Department	1996	15,529
Blue Hole Natural Monument	Forest Department / Belize Audubon Society	1996	1,023
Caye Caulker Marine Reserve	Fisheries Department	1998	9,670
Corozal Bay Wildlife Sanctuary	Forest Department / Sarteneja Alliance for Conservation and Development	1998	178,000
Gladden Spit and Silk Cayes Marine Reserve	Fisheries Department / Southern Environmental Association	2000	25,978
Glover's Reef Marine Reserve	Fisheries Department	1993	86,653
Half Moon Caye Natural Monument	Forest Department / Belize Audubon Society	1982	9,771
Hol Chan Marine Reserve	Fisheries Department	1987 / 2014	102,400
Laughing Bird National Park	Forest Department / Southern Environmental Association	1996	10,119
Port Honduras Marine Reserve	Fisheries Department / Toledo Institute for Development and Environment	2000	100,000
Sapodilla Cayes Marine Reserve	Fisheries Department	1996	38,594
South Water Caye Marine Reserve	Fisheries Department	1996	117,875
Swallow Caye Wildlife Sanctuary	Forest Department / Friends of Swallow Caye	2002	8,972
Turneffe Atoll Marine Reserve	Fisheries Department / Turneffe Atoll Sustainability Association	2012	325,412

# Marine Reserve Management Zones and Regulations

While fishing in most of Belize's coastal waters is regulated by the Fisheries Act and Fisheries Regulations, the waters within Marine Reserves have site-specific regulations for improved fishery management

Each of the nine Marine Reserves are divided into zones - with rules and regulations to strengthen fisheries management, and to facilitate tourism management - both are important uses of the reef.

**General Use Zone:** The largest zone of each Marine Reserve is a clearly defined General Use Zone, and open to fishing. However, unlike the water outside the protected areas, there are generally more regulations about what gear you can use, and fishermen are more likely to see patrol boats enforcing the regulations.

**Conservation Zones:** Some areas within Marine Reserves are designated as Conservation Zones. This means that fishing isn't permitted within these areas. There may be more than one reason for this - the area may be an important nursery area for conch, a spawning aggregation site for snapper and grouper, or an important mangrove nursery, and important for maintaining the fishery. It may also be protected because it is an area of particularly healthy reef that is able to withstand coral bleaching, and therefore important for maintaining the health of the rest of the reef - or it may be a major dive site, and a key destination for the tourism industry.

Conservation Zones are open to tourism activities, but these tend to be at very specific sites - for example reef dive sites, wrecks, or areas where manatees or sharks can be seen regularly. Some Conservation Zones (Conservation Zone II) may also be classified as Special Management Areas, and allow for special permitted access - for example, for traditional fishing at spawning aggregation sites by local fishers with special licenses, or for seasonal use.

**Preservation Zones:** These have been identified as the most important zones for maintaining the health of the reef and the fishing and tourism industries. No fishing or tourism activities are allowed in these zones, to ensure human pressure on these areas is kept as low as possible.

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**Zones may change over time - as we learn more about the reef and fisheries, we have improved knowledge about what needs to be protected to ensure the fishing and tourism industries continue to be sustained long into the future!**

## WHAT CAN I DO? WHERE CAN I DO IT?

Marine Reserves are divided into zones, each zone with different rules and regulations as to what can and can't be done, and where.

### GENERAL USE ZONE

- Commercial fishing with a valid fishing license for the relevant Managed Access area
- Gear restrictions: No long lines, spear guns or gill nets
- No traps made with seine, cast nets, gill nets, trammel nets or tangled nets

### CONSERVATION ZONE I (Replenishment Zone)

- No commercial or subsistence fishing of any kind
- Tour guides must follow the Belize Tourism Board regulations for guiding, as well as area specific regulations

### CONSERVATION ZONE II (Replenishment Zone)

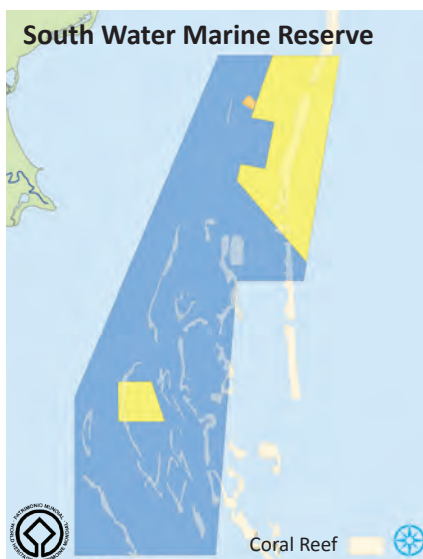
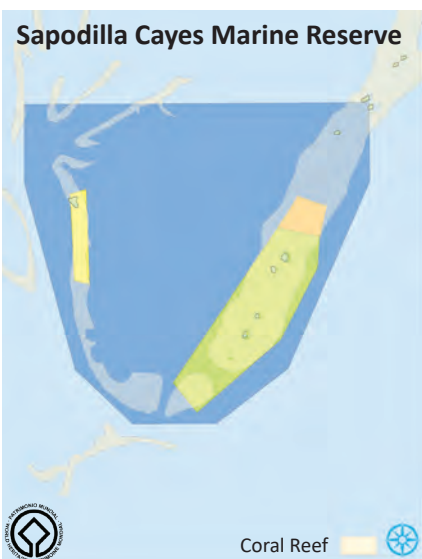
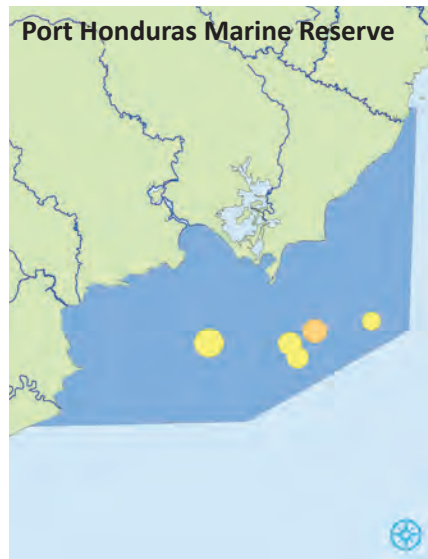
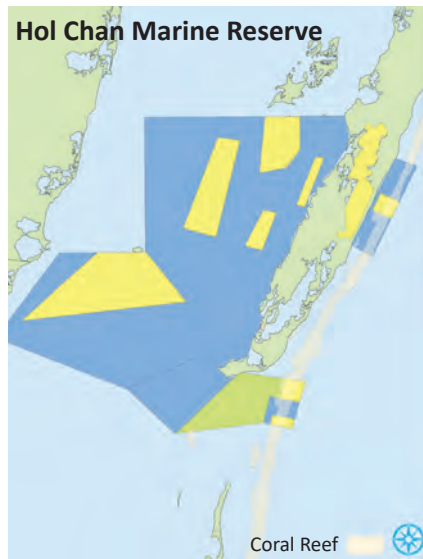
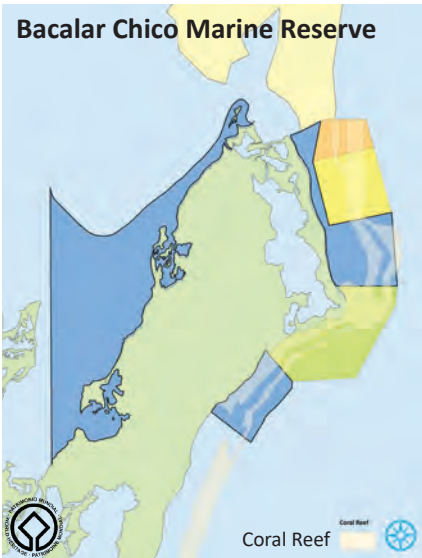
- No commercial or subsistence fishing of any kind, unless under special permit
- Tour guides must follow the Belize Tourism Board regulations for guiding, as well as area specific regulations

### PRESERVATION ZONE (Replenishment Zone)

- No commercial or subsistence fishing of any kind
- No tourism activities
- No boat access unless authorized

### SPECIAL MANAGEMENT AREA

- Fishing may be restricted to specific people (generally traditional fishers) or to certain times of the year (seasonal closures)



# Other Marine Protected Areas



Five marine protected areas established under the Forest Department are also considered part of the marine protected areas system. Unlike the Marine Reserves (established under the Fisheries Department), which are designed for management of the fishery, these are non-extractive areas, established for protection of physical / biological features of national significance, key species (manatees), and tourism resources.



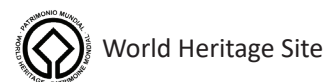
**Wildlife Sanctuary:** Wildlife Sanctuaries are established to protect nationally significant species, ecosystems or physical features. Both Corozal Bay Wildlife Sanctuary and Swallow Caye Wildlife Sanctuary were established to protect key sites for Antillean manatees, as part of the national strategies for conservation of this species. The two protected areas are currently designated as non-extractive, no-fishing areas. However, for Corozal Bay Wildlife Sanctuary, there is an unwritten agreement with Forest Department to allow continued traditional fishing by local communities, with the development of a sustainable fishery plan.

Under the 2015 revision of the National Protected Areas System Act, it is proposed that Corozal Bay Wildlife Sanctuary be re-designated as a Wildlife Sanctuary II - *“to protect nationally significant species, biotic communities or physical features, and allow for traditional sustainable extraction of natural resources”*.



**National Park:** One marine protected area, Laughing Bird Caye, has been established as a National Park, with use limited to research, education and tourism. No extraction is permitted within the boundaries. The National Park was established as a result of lobbying by tour guides, and protects a key tourism resource used by central coastal communities - particularly

**Natural Monument:** Natural Monuments protect and preserve natural features of national significance. Two of Belize's Natural Monuments are marine-based, and both are located on Lighthouse Reef Atoll. The Blue Hole and Half Moon Caye are both key tourism destinations, and are non-extractive, with no fishing permitted within their boundaries.



# Co-Management Partners

Management of many of the marine protected areas is strengthened by partnerships with non-government organizations - the co-management partners. These co-management partners have different roles depending on the site-specific agreement, but generally they:

- Assist the Fisheries and Forest Departments in enforcing the Fisheries laws and protected area regulations
- Conduct research and monitoring to ensure management is based on good science, whether for biodiversity, fisheries or tourism
- Implement environmental education and outreach programmes for improved awareness and good stewardship
- Raise funds for improved management of the protected areas
- Assist communities in understanding and benefitting from the sustainable use and ecosystem services of the protected areas through building capacity, encouraging community stewardship and providing opportunities



## **Belize Audubon Society (BAS)**

**Established:** 1969

**Management Partner:** Forest Department

**Marine Protected Area(s):**

- Blue Hole Natural Monument
- Half Moon Caye Natural Monument



## **Southern Environmental Association (SEA)**

**Established:** 2008

**Management Partner:** Forest Department; Fisheries Department

**Marine Protected Area(s):**

- Laughing Bird Caye National Park (Forest Department)
- Gladden Spit and Silk Cayes Marine Reserve (Fisheries Department)



## **Toledo Institute for Development and Environment (TIDE)**

**Established:** 1997

**Management Partner:** Fisheries Department

**Marine Protected Area(s):**

- Port Honduras Marine Reserve



## **Sarteneja Alliance for Conservation and Development (SACD)**

**Established:** 2007

**Management Partner:** Forest Department

**Marine Protected Area(s):**

- Corozal Bay Wildlife Sanctuary



## **Turneffe Atoll Sustainability Association (TASA)**

**Established:** 2013

**Management Partner:** Fisheries Department

**Marine Protected Area(s):**

- Turneffe Atoll Marine Reserve



## **Friends of Swallow Caye (FoSC)**

**Established:** 1996

**Management Partner:** Forest Department

**Marine Protected Area(s):**

- Swallow Caye Wildlife Sanctuary

# Managed Access



## Empowering fishers for effective collaboration in the management of the fisheries resources on which they depend for their livelihood.

Belize's fishery has historically been based on an open-access system, with all licensed fishermen being able to access all fishing areas, and with fishing restricted only by the Fisheries regulations and what they can catch. As the Belize population increased, more people opted to become fishermen, not only from the growing fishing communities, but also from inland communities. This resulted in increasing pressures on the marine resources - not just on the commercial fish species, but on the health of the reef itself.

Managed Access is a fisheries management tool that provides 'rights-based' access to customary fishers for their fishing grounds. It focuses on protecting the rights of fishers in their traditional fishing areas, whilst stopping the unsustainable growth in the number of fishers. It achieves this through developing, encouraging and incentivising good stewardship, towards better catches and improved incomes.

Managed Access was piloted in two areas - Glover's Reef and Port Honduras Marine Reserves. Following review of success of the initial pilot implementation, and extensive consultations with fishers throughout Belize, it is now being rolled out nationally to eight distinct areas, or TURF's, with the open sea considered as the ninth area.

Identification of customary users is based on validation of Belize residency, and through a transparent, peer review process led by the Community Managed Access Committees, comprised of local fisher representatives, Fisheries Department and co-management partners.

Implementation of Managed Access is based on the establishment of area-specific fishing licenses, and supported by a robust monitoring and enforcement regime. It is also supported by science-based catch limits through a total allowable catch (TAC), to guide sustainable management of the fishery, and by improvements to livelihoods and the fishing industry by linking Belize's sustainable seafood to premium markets.

### WHY MANAGED ACCESS?

Managed Access benefits the traditional fishermen.

Managed Access...

- recognises those fishermen with a long term interest in specific fishing areas
- protects their rights to fish in that area
- protects these areas against incursions by fishermen who are not long-term customary users, and against illegal trans-boundary incursions
- improves fisher compliance through self-enforcement of the rules
- improves collaboration between fishers and area managers, reducing violations
- improves compliance with management interventions that will increase the performance and productivity of the fishing areas
- improves cooperation with managers and scientists to gather and report catch data
- takes advantage of market opportunities to increase revenue
- provides Belize with increased food security - fish are a local, reliable source of protein

### Territorial Use Rights for Fishing (TURF)

**"TURFs around the world have shown again and again that these systems directly benefit local communities and encourage stewardship of marine resources."**

*Environmental Defense Fund*



**Belize Fishing Areas**  
Belize Fisheries Department

Belize’s Managed Access Strategy is based on the current patterns of fishing, reflecting customary resource use patterns. It establishes user rights for Belizean fishermen, facilitating action against trans-boundary fishing incursions.

Managed Access:

- Strengthens management through a national system of secure tenure for fishermen to fish in designated fishing areas
- Empowers fishermen and improves livelihoods through community-based management and diversified, higher value markets
- Uses a national, multi-stakeholder collaboration including government, fishermen and NGOs to analyze and recommend policies
- Ensures territorial integrity

Based on the following components:

- Adaptive Management Framework
- Zoning and Licensing
- Compliance and Enforcement
- Total Allowable Catch and Monitoring and Catch Logs
- Premium and Diversified Markets
- Community Managed Access Committees
- Robust science

### THE ROLE OF THE MANAGED ACCESS COMMITTEES

Seven Managed Access Committees have been established, composed of local fishers and providing a mechanism for integrating resource users into the decision making process. The Managed Access Committee members are elected for two years at a time, and make the commitment to attend meetings, represent fishers, and report back to community. They also:

- Assist in management of the Managed Access area
- Provide input into the approval process for fishers wanting to fish in that area
- Ensure transparency in governance of Managed Access areas
- Make recommendations for the improvement of Managed Access



L. Tamai

# FISH RIGHT...THE KEY FISHERY REGULATIONS

## GENERAL

- No person shall set traps outside the reef or within 300 feet of the Barrier Reef
- No spear fishing within marine reserves
- No fishing without a valid fisher folk or fishing vessel license
- No one should fish using compressed air or scuba gear
- No fishing shall be conducted using explosives or chemicals

## CONCH (*Lobatus gigas* - once *Strombus gigas*):

- Shell length should exceed 7 inches (17.8 cm)
- Market clean weight and fillet weight should exceed 3 ounces (85 g) and 2.75 ounces (78 g) respectively
- No person or establishment shall buy, sell or have in possession diced conch meat except under a special permit issued by the Fisheries Administrator.
- Closed Season: July 1st to September 30th, or when the catch quota has been met

## LOBSTER (*Panulirus argus*):

- No person or establishment should have in possession fillet or diced lobster tail.
- It is illegal to have in possession any soft shell (molting) lobster or females with eggs (berried)
- It is illegal to remove from any female lobster any eggs or spawn or the setae or fibre to which any eggs or spawn are or have been attached.
- Minimum carapace length is 3 inches
- Minimum tail weight is 4 ounces
- Closed season: 15th February to 14th June

## FISH FILLET:

- Every fish, other than Nassau groupers and grazers, caught in Belizean waters and landed as fillet fish should have a skin patch of 2 inches by 1 inch

## SEA CUCUMBER:

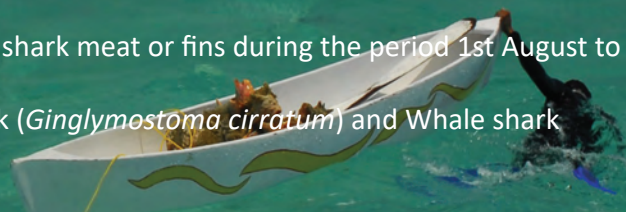
- **No person shall engage or attempt to engage or assist a person to engage or attempt to engage in fishing, of any kind, for sea cucumber without a special license from the Fisheries Administrator**
- Individuals applying for special license for sea cucumber must have a valid fisherman's license
- No person shall fish for, or harvest, at any time in the waters of Belize, or buy, sell, have in possession, export or attempt to export any sea cucumber between July 1st and Dec 31st (Special license required)

## NASSAU GROUPE:

- No person shall take in the waters of Belize, buy, sell, or have in his possession any Nassau Grouper (*Epinephelus striatus*) between 1st December and 31st March
- No person shall take, buy, sell, or have in his possession any Nassau Grouper which is less than 20 inches and greater than 30 inches
- All Nassau Grouper are to be landed whole

## SHARKS

- No person shall take, buy, sell, possess, and export shark meat or fins during the period 1st August to 31st October
- No person shall take or kill any shark of Nurse shark (*Ginglymostoma cirratum*) and Whale shark (*Rhincodon typus*) in the waters of Belize
- No person shall engage in shark finning
- Fishing for any other non-protected shark species requires a special license issued by the Fisheries Administrator
- All sharks are to be landed with the fins attached



## WHELKS (*Cittarium pica*)

- No person shall take, buy, sell, possess, or export whelk of the species West Indian Top Shelf Whelk (*Cittarium pica*) without a special license
- The legal size limit is 2.44 in (62 mm) in diameter
- All whelk shells should be landed with meat
- Closed season January 2nd to September 30th

## TARPON, BONEFISH, PERMIT

These species of fish are designated for the purpose of sport fishing

- Bonefish commonly known as “macabi” Scientific name: *Albula vulpes*
- Permit Scientific name: *Trachinotus falcatus*
- Tarpon: Scientific name: *Megalops atlanticus*
- No person shall have in possession any bonefish, permit fish or tarpon or any of its product forms, save and except in the act of catch and release.
- No establishment shall have in its possession any bonefish, permit fish or tarpon or any of its product forms

**NOTE:** Catch and Release means the act of catching fish and then releasing them back immediately into the waters of Belize in the same state in which the fish was landed

## GRAZERS:

- No person shall take in the waters of Belize, buy, sell, or have in his possession any grazers. Grazers refer to any fish of the parrotfish, angel fish and tangs (Scaridae and Acanthuridae)

## CORAL:

- It is illegal for any person to take, buy, sell or have in his possession any type of coral
- An exception is made in the case of Black Coral - this may only be bought, sold or exported with a licence from the Fisheries Administrator

## MARINE TURTLES:

- No person should interfere with any turtle nest
- No person should take any species of marine turtle
- No person shall buy, sell, or have in his possession any turtle or articles made of turtle parts

## TRAWLING

- No person shall engage in trawling

## RESEARCH

- Every person who applies for a research permit needs to submit a proposal for vetting and approval
- Bio-prospecting also requires special permission

## GEAR RESTRICTIONS

### NETS AND LONG LINES

- No gill net, or series of joined gill nets, can exceed 300m in length
- Gill, seine and stop nets, and long lines cannot block a river, creek or stream. No net or long line can stretch more than a quarter of the distance across that river, creek or stream and must not exceed 200m in total length
- No gill net, seine net, stop net, or long line can be set in a lagoon, that is more than one-tenth of the distance across the lagoon, and can not exceed 200m in total length
- No nets or beach traps can be set within half a mile of any city, town, or village

### WITHIN A MARINE RESERVE

- Valid licences are required for commercial fishing, sport fishing and recreational fishing in a Marine Reserve
- Fishing activities conducted in Marine Reserves can only be those permitted in accordance to the specific zone regulations.
- The use of beach traps and fish traps is prohibited in Conservation and Preservation Zones
- A license is required for the use of beach traps and fish traps in the General Use Zone.
- Fishing in a Conservation Zone is prohibited without a license
- Fishing, snorkelling and diving are prohibited in a Preservation Zone
- Spearfishing is prohibited in Marine Reserves
- Use of long lines, seine nets and gill nets is not permitted within Marine Reserves
- It will be assumed that anyone with a speargun, polespear, Hawaiian sling, spearfishing mask or powered speargun or sling is attempting to engage in spearfishing

### WHO ENFORCES THE FISHERIES REGULATIONS?

The Fisheries Regulations are part of Belize's laws. Enforcement may be by:

- Fisheries Officers
- Protected area co-management organizations (e.g. BAS, TIDE, SEA, SACD) on behalf of the Fisheries Department
- Belize Coast Guard, on behalf of the Fisheries Department

# GUIDE RIGHT...THE KEY TOURISM REGULATIONS

The marine environment is fragile, and without some guidance, tourists can impact the coral health. Tour guides are responsible for the impact their visitors have on the reef, and can influence use of best practices.

## BELIZE REGULATIONS FOR THE TOUR GUIDE

- A guided scuba diving group should be conducted with a ratio of 1 guide to every 8 divers. If the group exceeds this ratio, dive assistants shall be added in order to stay within the ratio.
- Water entry points from boats shall lie over water with sufficient depth allowing divers to become acclimated with no impact on corals or sea grass beds.
- When diving from shore, a diver buoy shall be placed and entry and exit routes shall be used to avoid walking on corals or sea grass beds.
- Dive leaders have the responsibility of preventing any diver from participating in the dive if, following a risk assessment, this is determined to be in the best interest of the diver, other divers, or both.
- The consumption of alcohol prior to or during a guided scuba diving tour is not allowed.
- A scuba diving tour operator should have an Emergency Action Plan (EAP), include a list of emergency procedures to follow and medical services numbers.

## REGULATIONS RE. WILDLIFE

Under Belize law it is illegal to harm, kill or disturb any of the following species:

- Whales
- Dolphins
- Antillean manatee
- Saltwater crocodile
- Morelet's crocodile

It is illegal to kill whale sharks, nurse sharks or any of the marine turtles.

- When in the water, keep your distance and avoid startling marine turtles, manatees, sharks or crocodiles.
- Do not disturb any of these when they are resting, sleeping or feeding.
- Move away from these species if they show signs of distress.
- Never try to spear, harass, catch, or ride these species.
- Do not touch or feed these species - including stingrays and nurse sharks.
- Take all garbage home with you - trash can kill, especially when it is mistaken for food.

## BEST PRACTICES FOR THE TOUR GUESTS

- Never touch corals; even a slight contact can harm them and some corals can sting or cut you.
- Maintain a comfortable distance from the reef.
- Practice good finning and body control to avoid accidental contact with the reef or stirring up the sediment.
- Stay off the bottom and never stand or rest on corals.
- Avoid using gloves and kneepads in coral environments.
- Know where your fins are at all times and don't kick up sand.
- If snorkelling, stay horizontal in the water while you're near or above the reef.
- Learn to swim without using your arms.
- Move slowly and deliberately in the water—relax as you swim and take your time.
- Never chase, harass or try to ride marine life.
- Do not touch or handle marine life.
- If diving, make sure all your dive equipment is well-secured.
- Make sure you are neutrally buoyant at all times Carefully select points of entry and exit to avoid areas of reef.
- Take nothing living or dead out of the water, except recent garbage.



Best Practices adapted from Coral Reef Alliance ([www.coral.org](http://www.coral.org))



## Five Simple Guidelines for Responsible Reef Tourism

- Look....but don't touch!
- Choose a tour operator / tour guide that uses best practices
- Don't use insect repellent when snorkeling
- Use an approved, coral-safe sunscreen
- Take all garbage home with you

# River to Reef: The Northern Belize Coastal Complex

## WHY IS THE NORTHERN BELIZE COASTAL COMPLEX IMPORTANT?

**ECONOMY:** The reef and associated sites (such as Shark and Ray Alley) are some of the most visited in Belize, bringing tourists from around the world.

**SUPPORTING LIVELIHOODS:** The estuary, coastal lagoons and mangroves provide critical nursery areas for many commercial and sport fish species.

**SUPPORTING THREATENED SPECIES:** The sheltered waters behind Ambergris Caye are key for protection of threatened species such as critically endangered Goliath grouper and endangered Antillean manatee. Critically endangered and endangered marine turtles nest on the sea-facing beaches of Ambergris Caye.

**PROTECTION:** The barrier reef and coastal mangroves provide protection from storm damage for all communities of the NBCC. The shallow estuary and mud bank at Bulkhead Shoals filters out sediment and pollution before the water reaches the reef.

The Northern Belize Coastal Complex (NBCC) is a river-to-reef seascape of connected protected areas in northern Belize. Water flows from the Rio Hondo, New River and coastal lagoons of the mainland into the Corozal Bay Wildlife Sanctuary, and on to the reefs of Bacalar Chico, Hol Chan and Caye Caulker Marine Reserves.

The area is important for its reef formations, seagrass beds and extensive inundated mangroves. It is critical in the maintenance of Belize's threatened marine species - including Goliath grouper, marine turtles, Antillean manatee and sharks (the sheltered area behind Ambergris Caye has been a traditional nursery area for bull sharks, scalloped hammerheads and a number of ray species). The adjacent terrestrial components of Bacalar Chico National Park and Caye Caulker Forest Reserve are nationally and regionally important for their large extents of unimpacted mangroves and littoral forest, and for turtle nesting beaches.

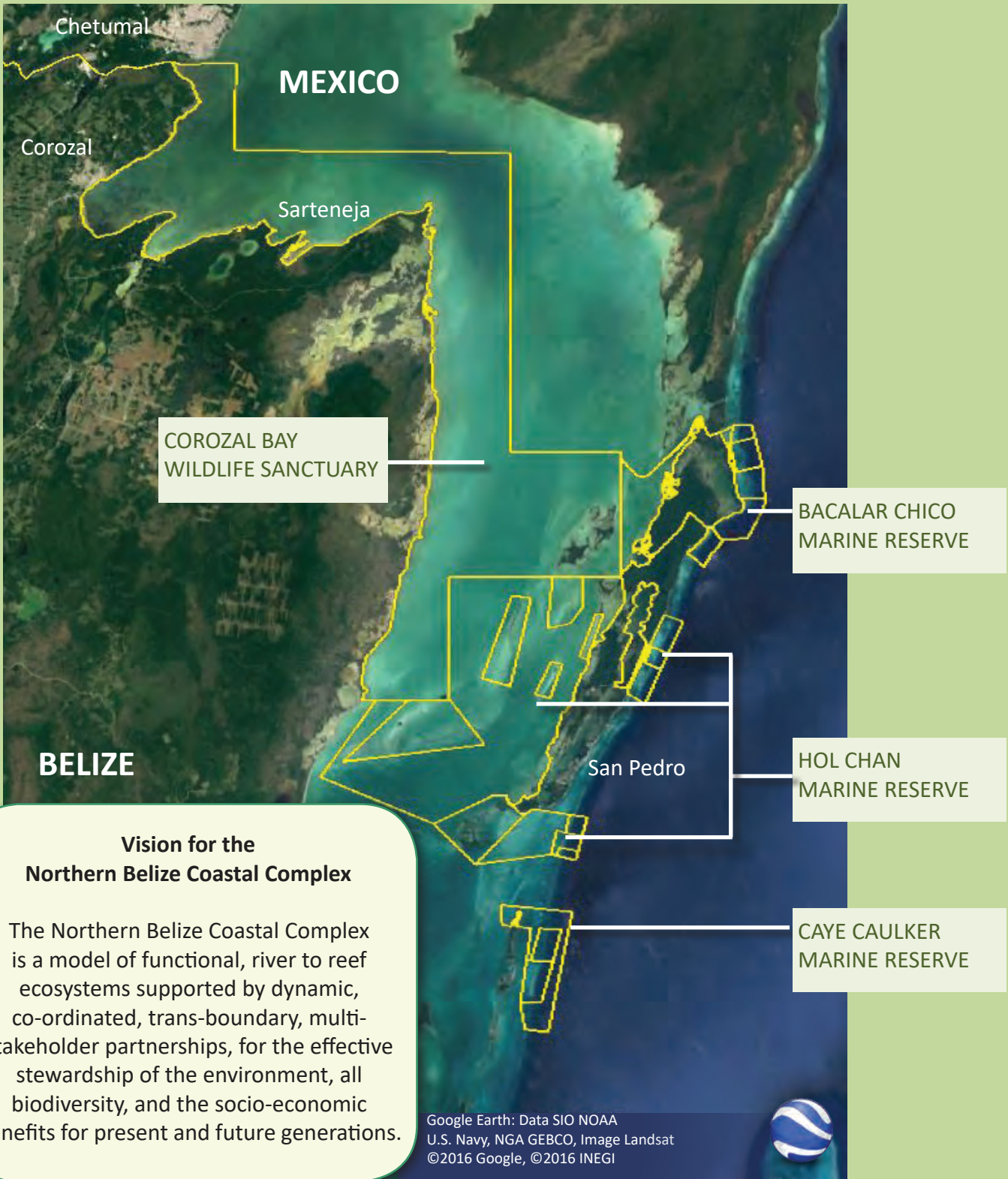
The NBCC is, itself, part of a larger, transboundary seascape - it is contiguous with the Sanctuario del Manati and Parque Nacional Arrecifes de Xcalak, in Mexico.

## WHAT IS AFFECTING THE NORTHERN BELIZE COASTAL COMPLEX?

**COASTAL DEVELOPMENT:** Clearing mangroves and coastal forests (removing fish nursery habitat, increasing erosion of coastlines), clearing beach vegetation (destroying turtle nesting sites).

**POLLUTION:** Land based agrochemicals (pesticides and fertilisers) from both Belize and Mexico, washed into the Rio Hondo and New River, and from there into the estuary. Sewage from coastal communities (San Pedro, Sarteneja, Corozal, Consejo), and communities on the rivers. Sewage from Chetumal and other coastal communities in Mexico.

**UNSUSTAINABLE FISHING:** Fishing by non-traditional users of the area, illegal fishing of under-sized / protected species, and by fishermen from Mexico and Honduras.



**Vision for the Northern Belize Coastal Complex**

The Northern Belize Coastal Complex is a model of functional, river to reef ecosystems supported by dynamic, co-ordinated, trans-boundary, multi-stakeholder partnerships, for the effective stewardship of the environment, all biodiversity, and the socio-economic benefits for present and future generations.

Google Earth: Data SIO NOAA  
U.S. Navy, NGA GEBCO, Image Landsat  
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# Corozal Bay Wildlife Sanctuary



Corozal Bay Wildlife Sanctuary is a part of the Mesoamerican Barrier Reef System - an important trans-boundary estuarine system, part in Belize and part in Mexico, that flows out to the Caribbean Sea.

The mangroves and littoral forest along the coastline provide protection for coastal communities such as Sarteneja, breaking strong winds and waves that come with seasonal tropical storms and north winds. These mangroves also provide essential nursery habitat for the mojarra and snapper, which form the basis of the local fishery, as well as for the snook, permit, bonefish and tarpon that support the sport fishing industry of San Pedro.

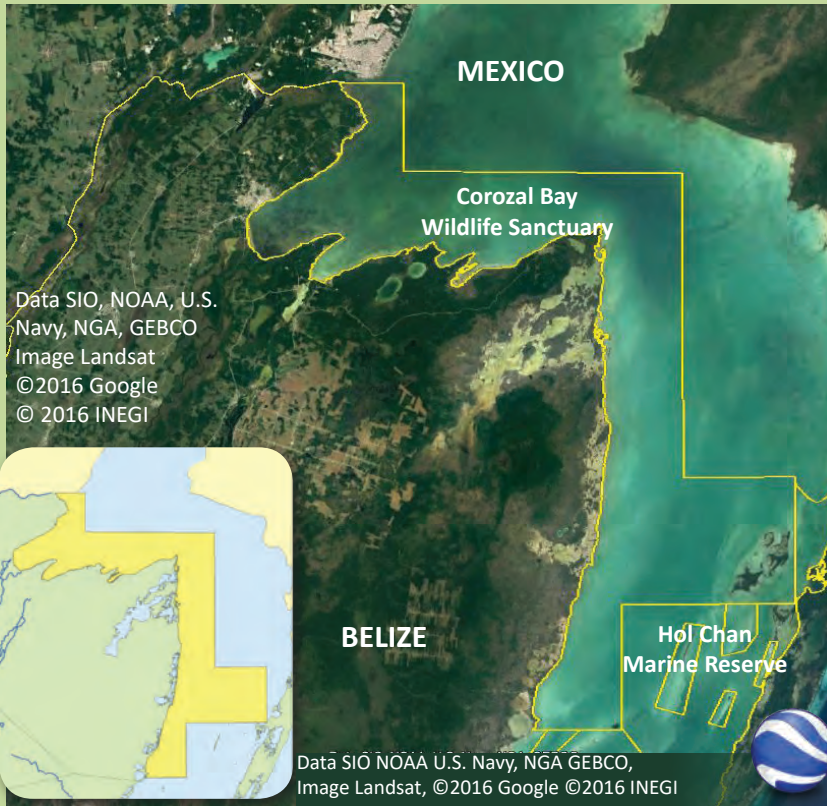
The sheltered waters of Corozal Bay provide critical habitat for mating and calving West Indian manatees. The shallow bay provides a protected nursery habitat for a variety of species, including the critically endangered goliath grouper and hawksbill turtle, and a number of shark species. The southern waters of the Wildlife Sanctuary include the only confirmed bull shark nursery in Belize. Fisher reports suggest that a remnant small tooth sawfish population may also still exist in these coastal waters and lagoons.



## KEY POINTS

- A trans-boundary estuarine system shared with Mexico
- Critical for reef health in northern Belize, filtering sediment and contaminants from the rivers before they reach the reef
- Supports traditional local fishermen and their families
- Provides sheltered waters, important for Belize's manatees
- Protects stromatolite formations unique in Belize
- Includes shallow waters behind Ambergris Caye, important for San Pedro's sport fishing industry
- Important coastal and lagoon mangroves - protecting lives and providing critical fish nursery habitats
- Managed by a community-based organization - SACD

*Corozal Bay Wildlife Sanctuary - community stewardship contributing towards river to reef connectivity*



**WHAT CAN I DO?  
WHERE CAN I DO IT?**

**CONSERVATION ZONE**

- It is illegal to take anything from Corozal Bay. However, in recognition of traditional use of the area, local fishermen who depend on the Wildlife Sanctuary can fish with a Managed Access fishing license valid for Fishing Area 1.
- Use of cast nets in front of the communities is also permitted by community members as a recreational / subsistence activity.
- Tour guides must follow the Belize Tourism Board regulations for guiding, as well as area-specific regulations, particularly in key manatee areas.
- Sport fishing is allowed, with a sport fishing license.

**UNIQUE STROMATOLITES**

Corozal Bay Wildlife Sanctuary has one of the very few identified freshwater stromatolite sites in the world. Stromatolites are the remnants of the earliest examples of living reefs, formed by cyanobacteria, which trap and bind sediments, creating rock-like structures.

Here, a 1.5km stretch of reef-forming stromatolites lie parallel to the Corozal shoreline. The layers formed by these stromatolites are built up year after year, and can provide long term information on environmental and climate change, going back several thousand years.



**FISHERMEN OF COROZAL BAY**

A number of traditional fishermen use the Wildlife Sanctuary for supporting their families and supplying the local market. The majority use beach traps, which extend from the coastline adjacent to Sarteneja. A critical objective of management is to work with the local fishermen and the Belize Fisheries Department towards a sustainable fishery that protects the fishermen's traditional rights, protects the nursery areas, and builds the local fish stocks.



SACD

**SITE INFORMATION**

**Size:** 178,000 acres (72,000 ha)  
**Established:** 1998

**Management Authority:** Forest Department  
**Co-management Partner:** Sarteneja Alliance for Conservation and Development (SACD)  
**Uses:** Non Extractive - tourism, education and research. Some traditional fishing also continues within the area. The area is also an important sport fishing destination.



*Local fishermen use heart-shaped beach traps, improving sustainability of catch*

# Bacalar Chico Marine Reserve



Bacalar Chico Marine Reserve is situated at the northernmost tip of Ambergris Caye, and includes the most northerly part of the Belize Barrier Reef - including Rocky Point, the only place in Belize where the reef meets the shoreline.

As part of Belize's World Heritage Site, this Marine Reserve covers the marine components of the combined Bacalar Chico Marine Reserve/National Park management unit. With Corozal Bay Wildlife Sanctuary to the west, the northern boundary runs along Belize's national border with Mexico.

Bacalar Chico Marine Reserve provides protection for a number of species of both national and international conservation concern, including the critically endangered Goliath grouper, hawksbill turtle, and both staghorn and elkhorn corals. The east-facing beaches, adjacent to the protected area, are important nesting sites for loggerhead and green turtles, along with the occasional hawksbill.

The protected Rocky Point spawning aggregation site, located 1km offshore, provides ideal conditions for mating congregations of commercially important species - including grouper, snapper, and jack. The drop-off is also an important conch nursery for both the Belize and adjacent Mexican fishing sectors.



## SITE INFORMATION

**Size:** 15,529 acres (6,284 ha)

**Established:** 1996

**Management Authority:** Fisheries Department

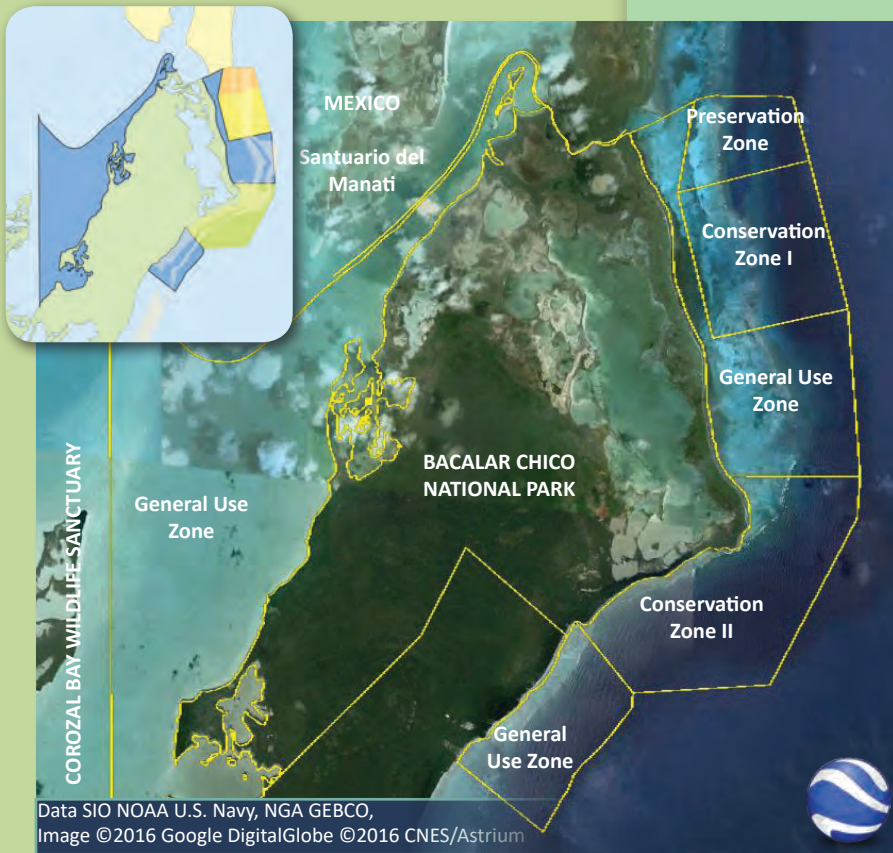
**Uses:** Fishing, tourism, education and research, depending on zones. The area is also an important sport fishing destination.

Wildtracks / LightHawk

## KEY POINTS

- Part of the Belize Barrier Reef Reserve System World Heritage Site
- Unique, exposed formation of Pleistocene fossilized coral bedrock at Rocky Point - the only place in the region where the Mesoamerican Barrier Reef meets the land
- Protects Rocky Point one of Belize's key spawning aggregation sites
- Contributes significantly to the viability of commercially important fish, lobster, and conch stocks
- Provides access to important nesting beaches for all three species of sea turtle
- Protection for critically endangered species including the goliath grouper
- High connectivity between reef, seagrass and mangrove
- A trans-boundary system shared with Mexico

*Bacalar Chico - an important nesting site for all three of Belize's threatened sea turtles*



Data SIO NOAA U.S. Navy, NGA GEBCO, Image ©2016 Google DigitalGlobe ©2016 CNES/Astrium

## WHAT CAN I DO? WHERE CAN I DO IT?

### GENERAL USE ZONE

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 1
- Only Bacalar Chico residents can fish for subsistence.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets.
- No nets except in beach traps. Beach traps must be monitored daily, and juveniles released.
- Tourism and recreational use is allowed, following BTB and zone regulations.

### CONSERVATION ZONE I

- No commercial, subsistence or sport fishing of any kind - these are replenishment zones.
- Tourism and recreational use is allowed, following BTB and zone regulations.

### CONSERVATION ZONE II

- No commercial or subsistence fishing of any kind.
- Sport fishing allowed with relevant licences.
- Tourism and recreational use is allowed, following BTB and zone regulations.
- Trolling is not allowed between December and February.

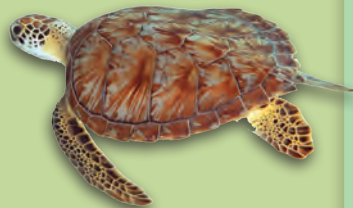
### PRESERVATION ZONE

- Key replenishment zone. No boat access without permission. No tourism, commercial, subsistence or sport fishing or tourism of any kind.



### DID YOU KNOW?

*The Bacalar Chico area is known for its turtle nesting beaches - all three species of sea turtle have been recorded nesting on the beaches near Rocky Point.*



### THE BACALAR CHICO CHANNEL



The Bacalar Chico Channel - a mangrove-lined creek that winds its way through inundated mangroves and lagoons, forming the international border that separates Belize from Mexico.

The Bacalar Chico channel is thought to have been dug by the Maya to provide easier access between the coast and the Corozal Bay estuary.

Wildtracks / LightHawk

# Hol Chan Marine Reserve



Hol Chan Marine Reserve is the most visited tourism destination in Belize. With its easy access from San Pedro and Caye Caulker, and the draw of seeing spectacular reef, turtles and brightly coloured reef fish at the Hol Chan Channel, and nurse sharks and stingrays at Shark Ray Alley, it supports a thriving tourism industry.

Most people living on Ambergris Caye are either directly or indirectly dependent on the tourism industry. The reef, particularly at Hol Chan, provides a first class snorkelling and diving destination for the many resorts and dive shops in the area. The flats provide world class sport fishing, an important boost to the local and national economy. The many restaurants are an important market for local fishermen.

The no-take zones of Hol Chan Marine Reserve are also important in maintaining marine species - impressive shoals of large fish demonstrate the importance and function of marine protected areas in maintaining fish stocks. Fore-reef, reef crest, back reef, and reef lagoon are all represented, as well as connectivity between various ecosystems - reef, seagrass, and coastal and caye mangrove - critically important for different life stages of many species. Over 160 species of fish have been identified in the reserve, along with nearly 40 species of corals, 3 species of sea turtle and at least 15 species of sharks and rays.



## SITE INFORMATION

**Size:** 102,400 acres (41,440 ha)

**Established:** 1987

**Management Agency:** Hol Chan Board of Trustees

**Management Authority:** Fisheries Department

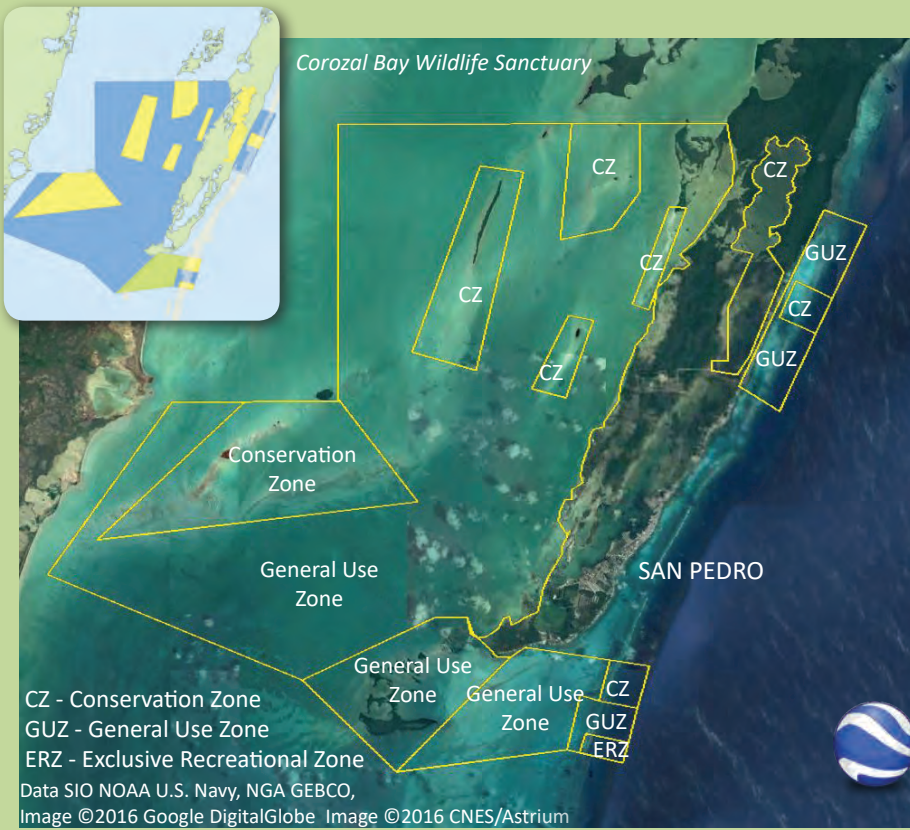
**Uses:** Fishing, tourism, education and research, depending on zones. The area is also an important sport fishing destination.

## KEY POINTS

- Lies next to Corozal Bay Wildlife Sanctuary as part of the largest estuary emptying into the Mesoamerican Reef
- Hol Chan channel and Shark Ray Alley are two of Belize's primary tourism destinations, critical to the health of Belize's economy
- Protects Bulkhead Shoals, an important mud bank that prevents sediment and pollution from leaving the Corozal Bay estuary, protecting the reef
- Bulkhead Shoals is also important for shallow water sites for the sport fishing industry
- Includes important mangrove cayes and coastal mangroves - fish nursery areas and bird nesting sites
- High connectivity between reef, seagrass and mangrove

*Hol Chan - one of Belize's top tourism destinations - critical to the economy of Belize*

Corozal Bay Wildlife Sanctuary



### WHAT CAN I DO? WHERE CAN I DO IT?

#### GENERAL USE ZONE

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 1.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets. Sport fishing is allowed with a permit.
- Tourism and recreational use is allowed, following BTB and zone regulations.

#### CONSERVATION ZONE I

- Replenishment zones / Exclusive Recreational Zone.
- No commercial, subsistence or sport fishing of any kind.
- No feeding of fish.
- Tourism and recreational use is allowed, following BTB and MPA regulations.
- Boats to be anchored at mooring buoys provided.

#### CONSERVATION ZONE II

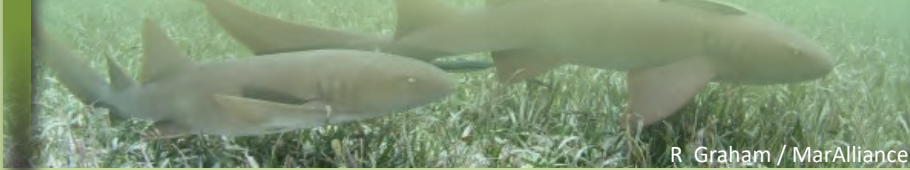
- No commercial or subsistence fishing of any kind.
- Tourism and recreational use is allowed, following BTB and MPA regulations.
- Sport fishing allowed with relevant permits.
- Boats to be anchored at mooring buoys provided.

#### PRESERVATION ZONE

- Key replenishment zones. No tourism, commercial, subsistence or sport fishing or tourism of any kind.

### DID YOU KNOW...

*The Nurse Shark is protected by the laws of Belize - it is illegal to handle, fish or sell this species.*



R. Graham / MarAlliance

### BEST PRACTICES FOR SHARK AND RAY ALLEY

***“no touching of flora or fauna shall be allowed in the exclusive recreation areas”***

Sharks, rays, turtles and manatees are protected under Hol Chan regulations.



### BEST PRACTICES

- **DO NOT TOUCH THE SHARKS AND RAYS - IT IS ILLEGAL**
- Respect sharks and rays - this is their home
- Choose a tour company that promotes best practices
- Let the sharks and rays come to you - don't chase them
- Never poke, prod, or ride the sharks and rays
- Don't hold the sharks and rays or restrict their movements in any way

# Caye Caulker Marine Reserve

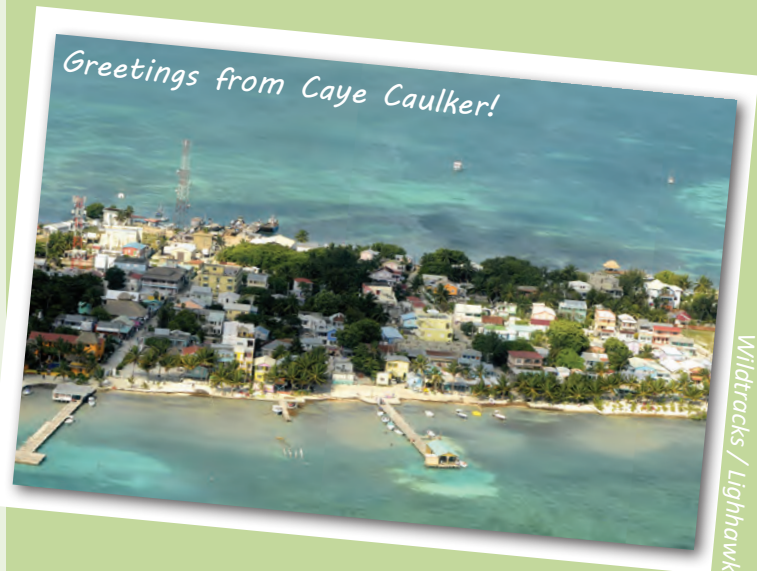


The Caye Caulker Marine Reserve is managed jointly with the associated Caye Caulker Forest Reserve, and encompasses five key coastal ecosystems - mangroves, littoral forests, lagoon, seagrass beds and the coral reef.

The barrier reef runs north-south, parallel to the caye, with the shallow waters of the reef lagoon providing sheltered swimming and snorkelling opportunities for both residents and visitors.

Stretching from the shallow sea grass beds of the reef lagoon to beyond the fore-reef and reef drop-off, the Marine Reserve includes both spur-and-groove and reef crest formations as well as scattered patch reefs. Abundant marine life includes several species of international concern, including critically endangered staghorn and elkhorn corals. The endangered Antillean manatee and playful bottlenose dolphins can also be encountered.

Whilst its value is primarily as a tourism destination, particularly for visitors staying on Caye Caulker, the General Use Zone also supports a small number of local fishermen.



***Caye Caulker Marine Reserve - a nationally important tourism destination supporting local tour guides, and reliant on the health of the reef***

## KEY POINTS

- Important to the economy of Belize, and more specifically to the community of Caye Caulker, as a key tourism destination
- Enjoyed by Belizeans as a local vacation destination
- Key in maintaining the health of the reef and local commercial fish species
- Intact barrier reef provides protection to Caye Caulker from both storm surges and beach erosion
- Management responsibility is held by the Fisheries Department, with input from the Forest and Marine Reserve Association of Caye Caulker (FAMRACC)



**WHAT CAN I DO?  
WHERE CAN I DO IT?**

**GENERAL USE ZONE**

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 1.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets Sport fishing is allowed with a permit.
- Tourism and recreational use is allowed, following BTB and zone regulations.

**CONSERVATION ZONE**

- Replenishment zone.
- No commercial, subsistence or sport fishing of any kind.
- Tourism and recreational use is allowed, following BTB and zone regulations.
- Boats to be anchored at mooring buoys provided.

**PRESERVATION ZONE**

- Key replenishment zone. No boat access without permission. No tourism, commercial, subsistence or sport fishing or tourism of any kind.

**SITE INFORMATION**

**Size:** 9.670 acres (3,913 ha)  
**Established:** 1998  
**Management Authority:** Fisheries Department  
**Uses:** Fishing, tourism, education and research, depending on zones

**THE DO'S AND DON'TS OF SWIMMING WITH MANATEES**

The Antillean manatee is protected under the Belize legislation - the Wildlife Protection Act. It is illegal to:

*"...kill, molest by any methods and includes attempting to kill, take or molest by any method"*

Molest can include chasing or touching a manatee - any action that causes it to alter its behaviour.



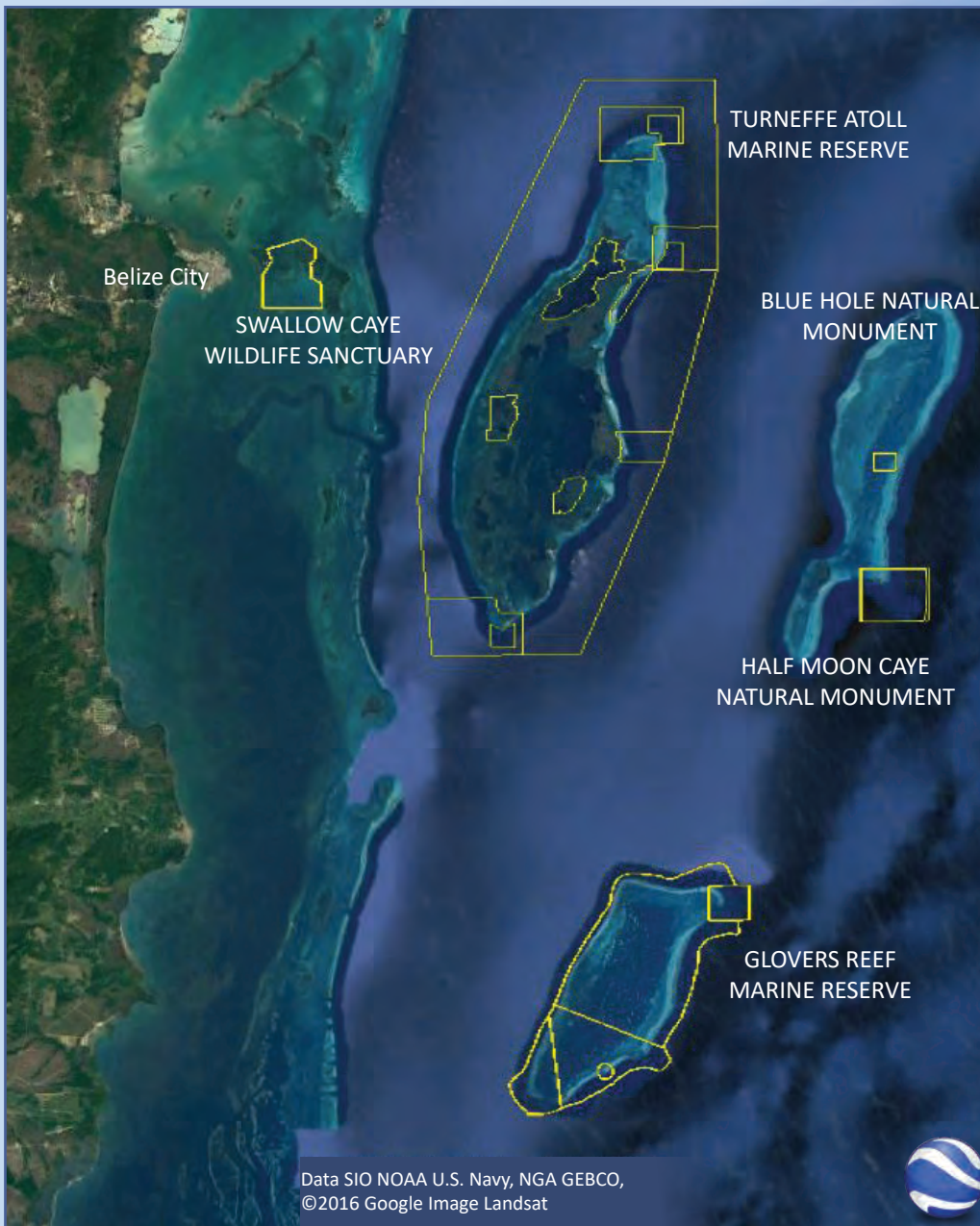
E. Gissis

**BEST PRACTICES AROUND MANATEES**

- When in the water, don't approach manatees, only look
- Stay on the surface - don't dive down towards the manatee
- Stay still if a manatee approaches...don't make any fast movements or loud sounds that may scare them
- Don't feed manatees, as this may alter their behaviour and place them at increasing risk from boats or poachers
- Don't chase a manatee while in the water nor in a boat
- Never separate a mother and her calf

# The Marine Protected Areas of Central Belize

The three atolls of Central Belize - Turneffe, Glover's Reef and Lighthouse Reef - lie beyond the Belize Barrier Reef - rising out of waters ranging from 1,000 to 4,000m deep. These atolls are three of the four such structures in the Mesoamerican Reef (the fourth is in Mexico). Also included within the Central Belize protected areas is the Swallow Caye Wildlife Sanctuary, established to protect its importance as a key Antillean manatee area.



## DEFINITION: ATOLL

*"a coral reef enclosing a shallow lagoon"*

## HOW WERE THE ATOLLS FORMED?

The Belize continental shelf, a platform of limestone rock that lies under the entire coastline of Belize, ends abruptly at the barrier reef crest, on top of the first of three tilted ridges that run northeast to southwest.

The first ridge runs parallel to the coast, and supports the Belize Barrier Reef. This drops off to the east to a depth of about 1,000m. The second ridge supports Turneffe, and the third supports Half Moon Caye and Glover's Reef atolls. After this third ridge, the water drops off to over 7,000m into the Cayman Trench. The ridges continue inland - the fourth ridge is the Maya Mountain Divide.



The three ridges - tilted escarpments that support the three atolls of Belize.

Ridges

## WHY ARE THE ATOLLS SO IMPORTANT?

**ECONOMY:** The clear, sheltered waters of the atolls provide some of the best snorkelling and diving in the region - bringing tourists from all over the world. The Blue Hole is one of the top "must dive" dive sites in the world, whilst Turneffe Atoll has global recognition for its sport fishing.

**SUPPORTING LIVELIHOODS:** The relatively healthy reefs of the atolls support both fishermen and tour guides and their families. Spawning aggregations of snapper and grouper contribute to the sustainability of the fishing industry.

**SUPPORTING THREATENED SPECIES:** The atolls provide sheltered feeding grounds and nesting cays for marine turtles and American crocodiles. The cayes are important way-points for migratory bird species.

**PROTECTION:** The atolls provide the first barrier to storms coming in from the east, providing some protection to the barrier reef, its cayes and the mainland.

## WHAT IS AFFECTING THE ATOLLS OF BELIZE?

**CAYE DEVELOPMENT:** Clearing mangroves and caye vegetation removes fish nursery habitat and increases erosion of cayes. Clearing beach vegetation also destroys turtle nesting sites. Lighthouse Reef and Glover's Reef Atolls, in particular, have limited extent of mangroves, essential for reef health - removal of these will impact the entire reef and fishery.

**POLLUTION:** Caye and boat based pollution on the atolls is an issue, especially with poor solid waste and sewage management. However, land-based pollution from the mainland seldom reaches as far as the atolls.

**UNSUSTAINABLE FISHING:** With the distance from the mainland, illegal fishing of undersized / protected species, and trans-boundary incursions from Guatemala and Honduras are difficult to monitor and address.

# Glover's Reef Marine Reserve



Glover's Reef Marine Reserve is an important fishing ground for conch and lobster fishermen, providing recruitment, nursery, feeding and dwelling areas for lobster, conch and finfish.

The Marine Reserve encompasses the southernmost of Belize's three offshore atolls, considered the best developed biologically, with the greatest diversity of reef types. In recognition of the global importance of its reef, it is included as a component of Belize's World Heritage Site. The protected waters of the Atoll's lagoon provide nursery and feeding habitats for at least three species of sea turtles, eight species of sharks and rays, more than twenty species of aggregating reef fish, as well as numerous species of coral. The Atoll provides recruitment, nursery, feeding and dwelling areas for lobster, conch and finfish, and unique fish habitat in the interior lagoon.

The outer Atoll reef supports five sand cayes, and encircles a lagoon dotted with more than 850 patch reefs, broken in only three places, by deep channels that allow for the tidal flow of water between the lagoon and the open sea. The spur and groove formations of the outer reef structure are world-famous for their spectacular diving opportunities.

Glover's Reef provides an important tourism resource for coastal and caye communities, attracting divers, snorkellers, kayakers, and fly fishermen from all over the world.

## SITE INFORMATION

**Size:** 86,653 acres (35,067 ha)

**Established:** 1993

**Management Authority:** Fisheries Department

**Management Use:** Fishing, sport fishing, tourism, education and research



## KEY POINTS

- One of seven protected areas that together form Belize's World Heritage Site - the Belize Barrier Reef Reserve System
- An important fishing area for Belize's lobster and conch fishermen
- An important tourism destination for tour guides and tour operators from Dangriga and Hopkins, with sheltered reef snorkelling sites that support vibrant coral reef species
- Protection of a key spawning aggregation site, Northern Glover's Reef, for Nassau grouper
- An excellent sport fishing site, with flats providing habitat for bonefish and permit

*Glover's Reef Marine Reserve - a model of science-supported management*



**WHAT CAN I DO?  
WHERE CAN I DO IT?**

**GENERAL USE ZONE**

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 8.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets Sport fishing is allowed with a permit.
- Tourism and recreational use is allowed, following BTB and zone regulations.

**CONSERVATION ZONE**

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- Tourism and recreational use is allowed, following BTB and zone regulations.

**PRESERVATION ZONE**

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- No boat access unless authorized.

**SEASONAL CLOSURE**

- Closed to fishing from the 1st December to the 1st March..
- The Spawning Aggregation site itself is closed to fishing all year round.



**DID YOU KNOW...**

*The Wildlife Conservation Society has worked at Glover's Reef since 1995, supporting management through science, and partnering for improved resource use.*

**Managed Access at Glover's Reef**

In 2011, Glover's Reef Marine Reserve was selected as one of two pilot site for Managed Access - a rights based fisheries management regime that limits access to traditional fishermen. It reduces fishing pressure and illegal / unsustainable fishing practices by providing fishers with secured fishing grounds, and a place at the decision making table. Since the introduction of the programme, there has been a significant increase in support from fishermen as they see the benefits from the new management regime.

The Belize Fisheries Department, with the support of the Wildlife Conservation Society (WCS), the Environmental Defense Fund (EDF) and the Glover's Reef fishermen, piloted the Managed Access regime. The partnership identified mechanisms for strengthening all components of the process, from ensuring science-based management and decision making to fisher engagement, and improved surveillance and enforcement. WCS has been a lead player in strengthening fisheries management throughout Belize and has a robust monitoring program at Glover's Reef Atoll - promoting the use of new management and technology, from Managed Access to drones - and the SMART system for improved patrol reporting.



# Turneffe Atoll Marine Reserve



Turneffe Atoll Marine Reserve is recognized as an important traditional fishing ground, and a global ecological hotspot for threatened and endangered marine and terrestrial biodiversity. It is Belize's largest and most biological diverse marine reserve. The Marine Reserve features an important and interconnected network of marine ecosystems - reef, back reef flats, sea grass beds, mangrove lined creeks and lagoons, and littoral forests.

The waters of the atoll provides nursery and feeding habitats for at least thirty species of international concern (Critically Endangered, Endangered and Vulnerable), as well as commercially important species. These include the Queen conch, Caribbean spiny lobster, abundant reef fish species, Antillean manatee, American salt water crocodile, dolphins, hawksbill, loggerhead and green turtle; and five know spawning and aggregation sites. The wider deep water areas, provides important habitat for pelagic species such as marlin, sailfish, mackerel, jack, kingfish, sharks and cetaceans.

The Atoll also supports critically endangered staghorn and elkhorn corals, and the endemic white spotted toadfish. The sandy beaches and brackish lagoons provide some of the best remaining nesting and adult habitat for American saltwater crocodiles in the Caribbean.



Soldier Caye - Turneffe Atoll Trust

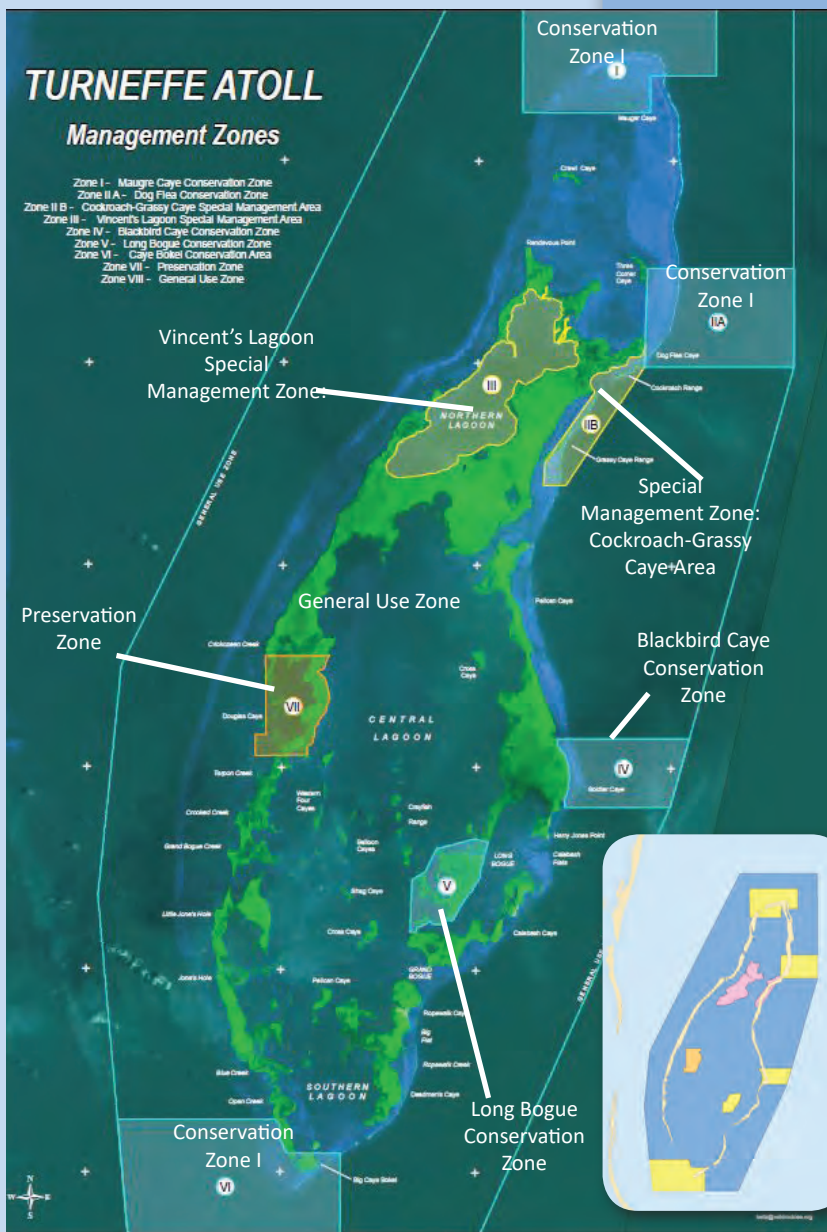


**Turneffe Atoll  
Sustainability  
Association  
(TASA)**

## KEY POINTS

- Turneffe Atoll is recognized as a key tourism destination for snorkellers, divers and sport fishermen, supporting the economy of Belize
- The Marine Reserve supports a traditional fishery based on conch, lobster and finfish, sustaining livelihoods, and empowers local stakeholder groups, inclusive of fishing communities, in the management of their natural resources
- It is one of the few protected areas that includes deep water - an under-represented ecosystem in Belize, and has five spawning aggregation sites located on the Atoll walls
- Turneffe Atoll Marine Reserve provides a physical barrier that shelters the Belize mainland, including Belize City, from tropical storms

***Turneffe Atoll Marine Reserve - provides important natural resources sustaining livelihoods through fishing and tourism***



**WHAT CAN I DO?  
WHERE CAN I DO IT?**

**GENERAL USE ZONE**

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 6.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets.
- Sport fishing is allowed with a permit.
- Tourism and recreational use is allowed, following BTB and zone regulations.

**CONSERVATION ZONE**

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- Tourism and recreational use is allowed, following BTB and zone regulations.

**PRESERVATION ZONE**

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- No entry unless authorized by the Fisheries Administrator.

**SPECIAL MANAGEMENT AREA**

- Vincent's Lagoon - important fish nursery area - fishing only by traditional users with special permission by the Fisheries Administrator.
- Cockroach-Grassy Caye Area: Conch nursery area. No harvesting of conch.

**Sport Fishing at the Turneffe Atoll Marine Reserve**

Turneffe is a world class sport fishing destination, with sport fishing for bonefish, permit and tarpon becoming increasingly important over the years in its contribution towards Belize's economy. Legislation was passed in 2009 restricting use of these three species to the sport fishing industry.



Jim Klug/Turneffe Flats

**SITE INFORMATION**

**Size:** 325,412 acres (131,690 ha)

**Established:** 2012

**Management Authority:** Fisheries Department

**Co-management Partner:** Turneffe Atoll Sustainability Association (TASA)

**Management Use:** Fishing, sport fishing, tourism, education and research

# Blue Hole Natural Monument



The spectacular Blue Hole can be seen from space - a dark, circular sinkhole set in a ring of corals and surrounded by the crystal-clear, shallow waters of Lighthouse Reef Atoll.



The Blue Hole is a collapsed cave system that lies at the centre of the Blue Hole Natural Monument. Almost perfectly circular, it is approximately 320m (1,000ft) across and 124m (400ft) deep, and resembling an hourglass shape in cross section. This underwater sinkhole, or cenote, has impressive submerged caves and stalactite formations that bring visitors from all over the world just to dive its depths. They also come for the sharks that use the hole, and are often seen during dives. Whilst most are Caribbean reef sharks, the occasional great hammerhead is seen, circling in the depths of the hole.

The Blue Hole tells a geological history of changes in sea level - the presence of stalactites indicates that the cave system was once above ground. Between 11,500 to 10,200 BC, a steady increase in sea level inundated the sinkhole with sea water. The tilting seen in the stalactites provides proof of the tilting of the ridge formed by the fault line, and studies of the sediments collected at the bottom of the sinkhole provide information on past storm events, mercury and arsenic levels, dust storms from Africa. It also provides indications of an increasing drought, a result of reduced tropical storm activity that may have caused the decline of Maya civilization.



BAS / LightHawk

*Blue Hole Natural Monument - Belize's most famous natural monument, bringing divers to Belize from around the world*

## KEY POINTS

- One of seven protected areas that together form Belize's World Heritage Site - the Belize Barrier Reef Reserve System A significant contributor to the economy of Belize as one of Belize's key dive destinations, bringing divers to Belize from around the world
- A world "must-dive" location, renowned for the high probability of seeing sharks
- Has pristine waters - far from the coastal impacts of pollution The largest geological feature of this type in the world, and visible from space



Blue Hole Natural Monument

Data SIO NOAA U.S. Navy, NGA GEBCO, ©2016 Google Image Landsat

**DID YOU KNOW....**

*The stalactites in the Blue Hole were formed above ground more than 10,000 years ago, then flooded by the rising sea.*



R. Graham / MarAlliance

**WHAT CAN I DO?  
WHERE CAN I DO IT?**

**CONSERVATION ZONE**

As a **NATURAL MONUMENT**, the Blue Hole is fully protected - it does not allow for any extractive use. The area is a no take zone, acting as a replenishment area that supports fishers of the Atoll.

The area is a no take replenishment zone. Fishing, sport fishing and the removal of any marine species (dead or alive) is prohibited.

**REGULATIONS**

- No fishing of any kind (including sport fishing). The removal of any marine species (dead or alive) is prohibited.
- No jet skis or mechanised dive equipment.
- No shark or fish chumming.
- All snorkellers and divers must be accompanied by a licensed tour guide, and keep to legislated guide:visitor ratios.
- All divers must be accompanied by a licensed dive guide, and keep to legislated guide:visitor ratios. Boats to follow marked channels and use mooring buoys.



**SITE INFORMATION**

**Size:** 1,023 acres (414 ha)  
**Established:** 1996  
**Management Authority:** Forest Department  
**Co-management Partner:** Belize Audubon Society (BAS)  
**Management Use:** Tourism, education and research

# Half Moon Caye Natural Monument

**It's all about the Boobies...or is it?** Half Moon Caye was first protected because of the importance of its white-phase red-footed booby nesting site....one of the only thriving nesting sites in the whole region. But the Half Moon Caye Natural Monument is so much more than just the bird colony.

Half Moon Caye Natural Monument also protects an impressive reef wall that drops to 1,000 m deep – and is considered to be one of Belize's best dive sites by both tour guides and visitors. Where this reef wall meets the corner of the Atoll, a regionally important spawning aggregation site acts as the gathering point for thousands of snapper and grouper, ensuring the continued sustainability of Belize's fishing industry.

The littoral forest of Half Moon Caye is one of the few protected remnants of this ecosystem - this vulnerable ecosystem has been removed from many other cayes to make way for tourism development. The forest is important as a way-point for Neotropical migrants, and provides nesting structure for resident birds, including the red footed booby and magnificent frigatebird colony. The south-east facing beach is used by nesting loggerhead, green and hawksbill turtles.



E. Gissis

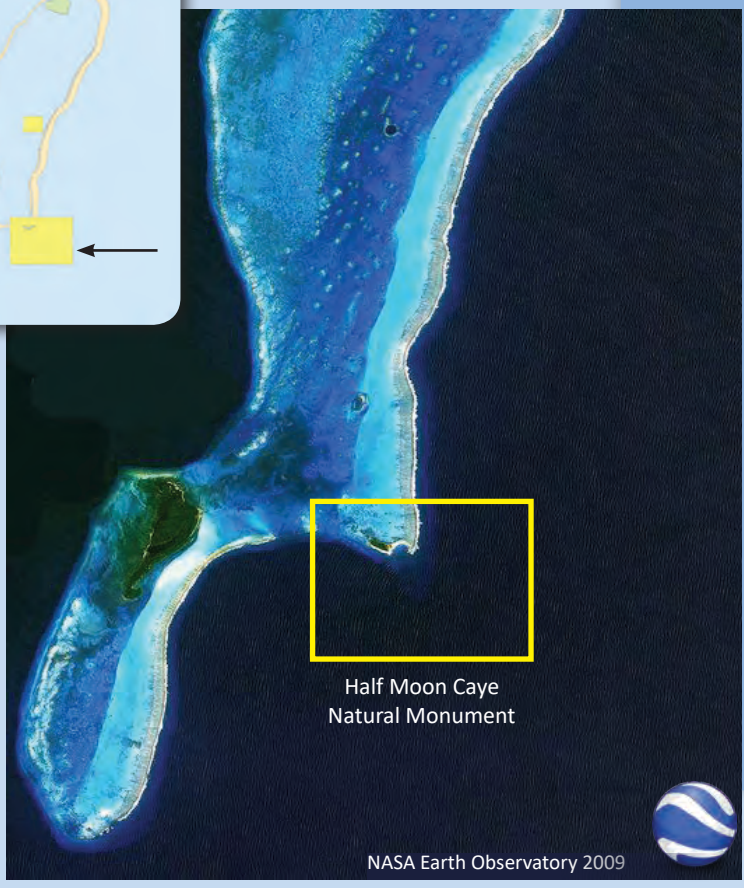
## It's All About the Boobies!

The littoral forest provides structure that supports one of the most important red-footed booby nesting colonies in the region. In 2015, the population of boobies was estimated at 3,700 individuals. The boobies share the nesting colony with over 1,730 magnificent frigatebirds.

### KEY POINTS

- One of seven protected areas that, together, form Belize's World Heritage Site - the Belize Barrier Reef Reserve System
- Pristine waters - far from the coastal impacts of pollution
- A key tourism resource, known for the beauty of the sandy beaches, for the red-footed booby nesting colony, and for the Half Moon Caye Wall dive site
- Protects an important spawning aggregation site, contributing to maintenance of Belize's commercial fishery
- Protects an important conch nursery area, acting as a replenishment zone and supporting the traditional fishery of the Atoll
- Provides protection for littoral forest, a high priority threatened ecosystem that is rapidly disappearing across Belize

*Half Moon Caye Natural Monument - the first protected area to be established in Belize*



Half Moon Caye Natural Monument

NASA Earth Observatory 2009



**WHAT CAN I DO?  
WHERE CAN I DO IT?**

**CONSERVATION ZONE**

As a **NATURAL MONUMENT**, the Blue Hole is fully protected. The area is a no take zone, acting as a replenishment area that supports fishers of the Atoll.

**REGULATIONS**

- Fishing of any kind (including sport fishing) is prohibited.
- No jet skis or mechanised dive equipment.
- No shark or fish chumming.
- All snorkellers and divers must be accompanied by a licensed tour guide, and keep to legislated guide:visitor ratios.
- All divers must be accompanied by a licensed dive guide, and keep to legislated guide:visitor ratios.
- Boats to follow marked channels and use mooring buoys.

Civil aviation requests that aircraft (including helicopters) do not fly low over Half Moon Caye Natural Monument and the bird nesting colony.



**DID YOU KNOW?**

*The Half Moon Caye bird colony was protected in 1928 as a Crown Reserve - the first area to be protected in Belize*



**SITE INFORMATION**

- Size: 9,771 acres (3,954 ha)
- Established: 1928 (Bird colony); Declared as Belize's first protected area: 1982
- Management Authority: Forest Department
- Co-management Partner: Belize Audubon Society (BAS)
- Management Use: Tourism, education and research



The South Point Lighthouse spawning aggregation site is under the protection of Half Moon Caye Natural Monument

© WWF / Nadia Bood

# Swallow Caye Wildlife Sanctuary



One of the most important areas for manatees in central Belize, Swallow Caye Wildlife Sanctuary encompasses approximately 8,972 acres of shallow waters and cayes within the Drowned Cayes area. It lies 3 miles east of Belize City, one of the busiest boat traffic areas in Belize.

The Wildlife Sanctuary is comprised of sea, seagrass beds, cayes (including Swallow Caye and a portion of Mapp's Caye) and mangrove-lined creeks that provide all the resources that manatees need - a favourite, sheltered feeding, resting, mating and nursing area, with plentiful food and clear waters. Swallow Caye is a popular tourism resource, the clarity of the crystalline waters resulting in its fame as a place to see these gentle mammals.

Before its protection, tourism impacts were unregulated, with visitors swimming with the manatees, leading to a significant decline in the number of individual manatees using the area. Since its establishment as a Wildlife Sanctuary, the development of regulations, and the presence of rangers, there has been careful monitoring and management of visitor interactions, and the manatees have returned.



## SITE INFORMATION

**Size:** 8,972 acres (3,630 ha)

**Established:** 2002

**Management Authority:** Forest Department

**Co-management Partner:** Friends of Swallow Caye

**Management Use:** Tourism, education and research

E. Gissis

## KEY POINTS

- Established to protect a key resting and feeding area for Antillean manatees (*Trichechus manatus manatus*)
- Managed by Friends of Swallow Caye, a community-based organization working from Caye Caulker
- An important tourism resource for coastal and caye communities near the Wildlife Sanctuary, bringing income to support tour guides and their families
- An important fisheries replenishment zone, replenishing fish stocks for fishers from Belize City



F. Munoz

*Swallow Caye Wildlife Sanctuary - the manatee heartland of Belize*

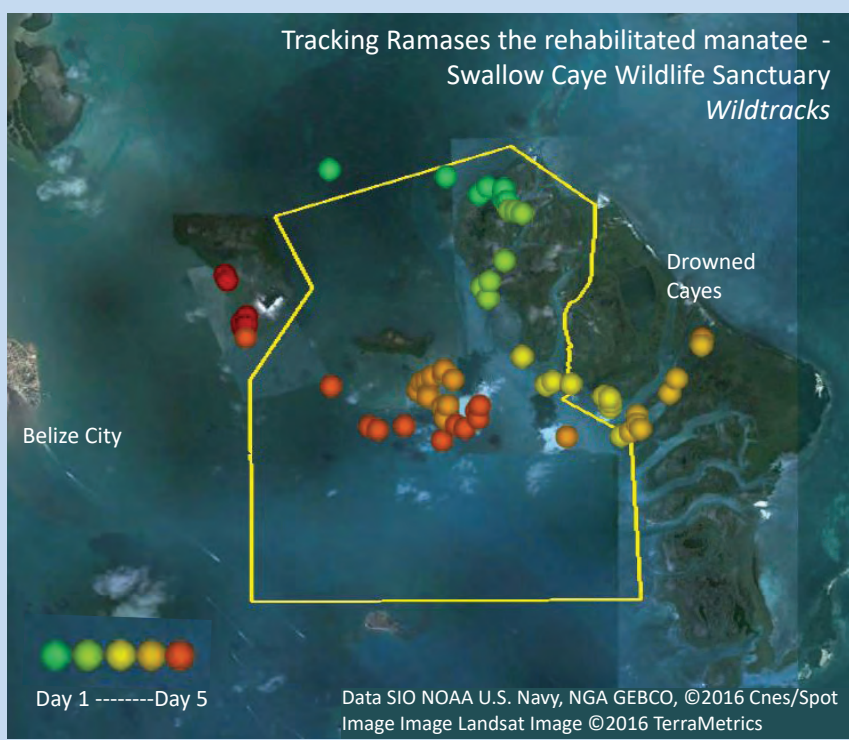


Data SIO NOAA U.S. Navy, NGA GEBCO, ©2016 Cnes/Spot Image  
Image Landsat Image ©2016 TerraMetrics

**DID YOU KNOW...**

*Manatees need to access fresh drinking water - the manatees of Swallow Caye Wildlife Sanctuary travel to the Belize River mouth approximately every ten days for water*

**Tracking Manatees:** Using satellite tags, it is possible to track the movement of manatees. This has shown that manatees do not generally stay in one place - many move between feeding and sheltered resting areas or to river mouths for freshwater. Some travel up and down the coastline, visiting coastal lagoons, and crossing into Mexican waters.



Tracking Ramases the rehabilitated manatee - Swallow Caye Wildlife Sanctuary Wildtracks

Data SIO NOAA U.S. Navy, NGA GEBCO, ©2016 Cnes/Spot Image  
Image Landsat Image ©2016 TerraMetrics

**WHAT CAN I DO?  
WHERE CAN I DO IT?**

**CONSERVATION ZONE**

As a WILDLIFE SANCTUARY, the Swallow Caye area is fully protected.

**REGULATIONS**

- It is illegal to fish within the boundaries of the Wildlife Sanctuary - this includes both commercial, recreational and sport fishing.
- It is illegal to swim with the manatees, touch or feed them, to follow them in a boat, or cause them to change their behaviour in any way.

**Civil aviation requests that aircraft (including helicopters) do not fly low over the area.**



**A Passion for Manatees...**

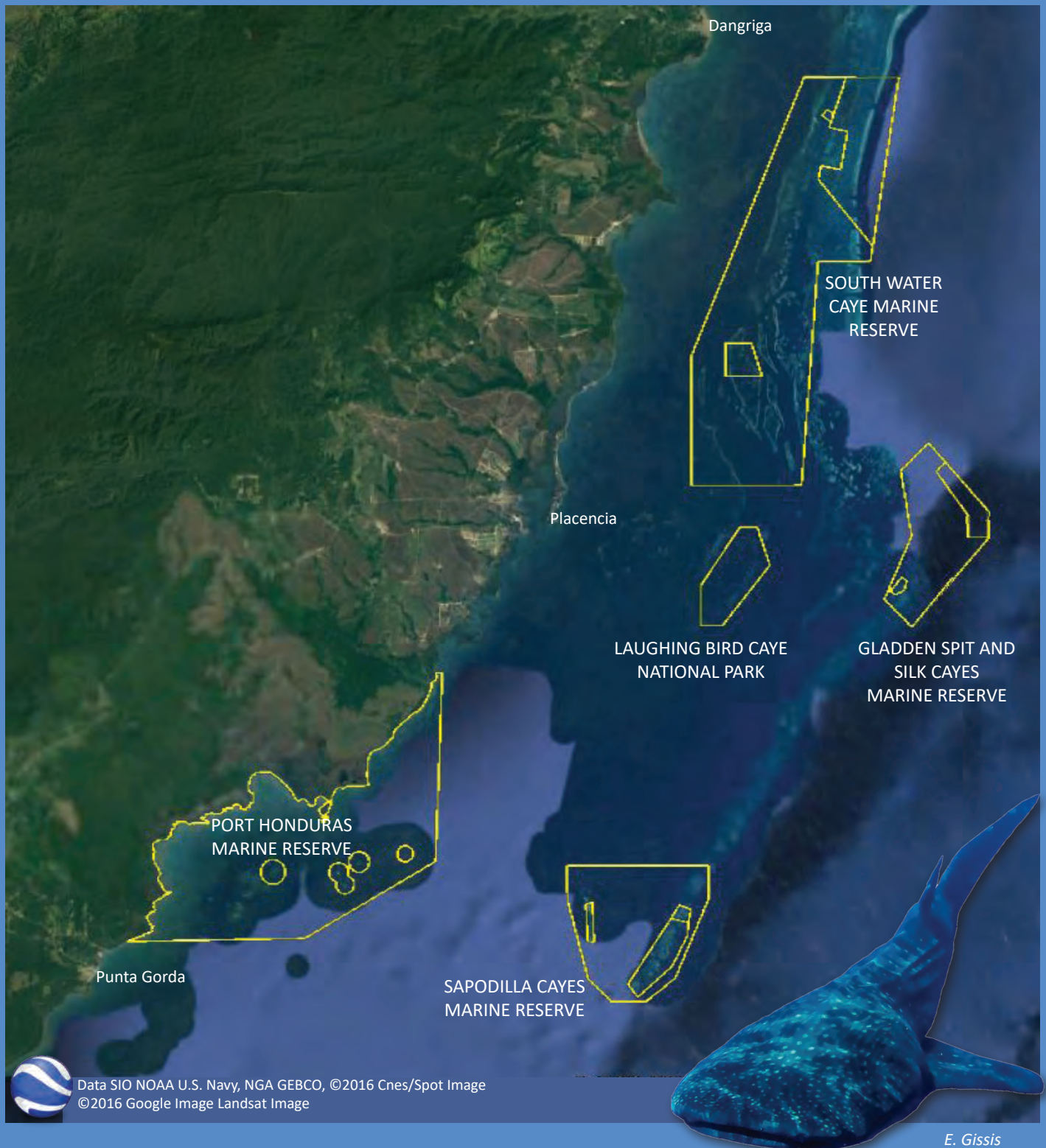
In 2003, Chocolate was awarded the James Waight Conservation Award, the most prestigious Belizean award for conservation. The James A. Waight Conservation Award is a testimony to the greatness of this man whose entire life was dedicated to the service of his country and his people.

He was a long time advocate for the protection of Belize's marine species, especially his beloved manatees of Swallow Caye.



"Chocolate" Heredia

# The Southern Belize Reef Complex



Data SIO NOAA U.S. Navy, NGA GEBCO, ©2016 Cnes/Spot Image  
©2016 Google Image Landsat Image

The **Southern Belize Reef Complex** (SBRC) encompasses some of the most important components of the Mesoamerican Reef.

It stretches from the littoral forest and mangroves of the coastline across the shallow coastal lagoon, with its scattering of idyllic cayes and reefs, to the Belize Barrier reef and the reef drop-off, where grouper and snapper gather in huge spawning aggregations. From the immense, impressive whale sharks to the smallest coral polyp, the reef and associated seagrass and mangroves are a complex, integrated series of ecosystems that support viable populations of threatened species, sustain the coastal fishing communities and draw tourists to Belize.

Southern Belize is an important sport fishing destination, offering opportunities for attaining the coveted Grand Slam - catching tarpon, permit and bonefish in one day.

#### WHY IS THE SOUTHERN BELIZE REEF COMPLEX SO IMPORTANT?

**ECONOMY:** The complex reefs, idyllic cayes, whale sharks of Gladden Spit and excellent sport fishing attract tourism to southern Belize.

**SUPPORTING LIVELIHOODS:** The rich waters of the Southern Belize Reef Complex support both commercial and subsistence fishermen. Spawning aggregations of snapper and grouper contribute to the sustainability of the fishing industry. Seagrass farming is succeeding as an alternative income generation activity for fishermen.

**SUPPORTING THREATENED SPECIES:** The Southern Belize Reef Complex includes important nesting beaches for marine turtles, key nursery areas for critically endangered Goliath grouper and two key areas for the endangered Antillean manatee. The Pelican Cayes support some of the richest reef biodiversity in the region.

**PROTECTION:** The barrier reef provides the first barrier to storms coming in from the east, breaking some of the force of storms before they reach the mainland. Coastal mangroves protect life and property by lifting storm winds and breaking storm surges.

#### WHAT IS AFFECTING THE SOUTHERN BELIZE REEF COMPLEX?

**COASTAL AND CAYE DEVELOPMENT:** Clearing coastal and caye mangroves removes fish nursery habitat, increases erosion of cayes and removes protection from tropical storms. Clearing beach vegetation also destroys turtle nesting sites.

**POLLUTION:** Land-based pollution is a significant issue, with agro-chemical runoff from banana and citrus farms. This is, however, overshadowed by the far higher levels of contamination and sediment load from the rivers flowing into the area from Guatemala and Honduras.

**UNSUSTAINABLE FISHING:** Illegal fishing of under-sized / protected species, and large-scale trans-boundary incursions from Guatemala and Honduras.

# South Water Caye Marine Reserve



South Water Caye Marine Reserve is of high economic importance to Belize as a lobster, conch and fin-fish resource for commercial fishermen, particularly from Sarteneja, Dangriga and Hopkins. It also provides subsistence fishing for people living on Tobacco Caye, South Water Caye and other cayes within the protected area.

The shallow, northern back-reef lagoon, between the reef crest and Tobacco Range, is a nationally important nursery area for conch. The highly connected mangroves and seagrass of Twin Cayes, Tobacco and Blue Ground Ranges, and the Pelican Cayes are particularly important as nursery areas for commercially important species for Belize's fishing industry and the entire reef system – not just the Marine Reserve.

The Marine Reserve has clear, sheltered waters, extraordinarily high biological diversity and one of the best examples of Barrier Reef. Its dazzling array of corals, benefit Belize's growing number of tourism operations, based from both the cayes and the mainland, attracting snorkellers and divers from all over the world, as well as providing the perfect environment for kayaking. The faroes in the southern part of the Marine Reserve, including the Pelican Cayes, are recognized for having a unique and fragile species assemblage, and species diversity unparalleled in the Caribbean.

Tobacco Caye Marine Station



## SITE INFORMATION

**Size:** 117,875 acres (47,700 hectares)

**Established:** 1996

**Management Authority:** Fisheries Department

**Management Uses:** Fishing, tourism, education and research, depending on management zone

## KEY POINTS

- One of seven protected areas that together form Belize's World Heritage Site - the Belize Barrier Reef Reserve System
- Includes a series of unique faro formations - unusual, steep-sided, diamond-shaped rhomboid reefs
- Includes the Pelican Cayes, highlighted as one of the highest biodiversity areas of Belize's reef, and one of the most fragile
- The Pelican Cayes provide shelter for a number of endemic species - species not found anywhere else in Belize or the Caribbean

**South Water Caye Marine Reserve - supporting fishing and tourism livelihoods**



## WHAT CAN I DO? WHERE CAN I DO IT?

### GENERAL USE ZONE

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 3.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets.
- Sport fishing is allowed with a permit.
- Tourism and recreational use is allowed, following BTB and zone regulations.

### CONSERVATION ZONE

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- Tourism and recreational use is allowed, following BTB and zone regulations.

### PRESERVATION ZONE

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- No boat access unless authorized.

## The Unique Pelican Cayes

The Pelican Cayes are a series of unique faro formations - unusual, steep-sided, diamond-shaped rhomboid reefs formed by coral growth on the underlying limestone karst bedrock. Species richness of the Pelican Cayes is unparalleled in the Caribbean - with brilliantly coloured sponges, seagrass and corals covering reef and mangrove roots. The cause of this high diversity in such a small geographic area is not well understood, but may be because of the high level of connectivity between mangrove, coral and sea grass, and the low level of turbidity.

These reefs enclose ponds that are striking in their roundness, and support cayes with some of the richest mangrove ecosystems known in the Caribbean. The Pelican Caye ponds each have at least one opening to the surrounding seas, and are surrounded in part by mangrove forests.



*Tobacco Caye Marine Station*

- The Pelican Cayes are important for their high biodiversity and fragility
- The Pelican Cayes are considered at high risk from cayes development
- Between 1996 and 2009, 29% of the mangroves were lost from the Pelican Cayes

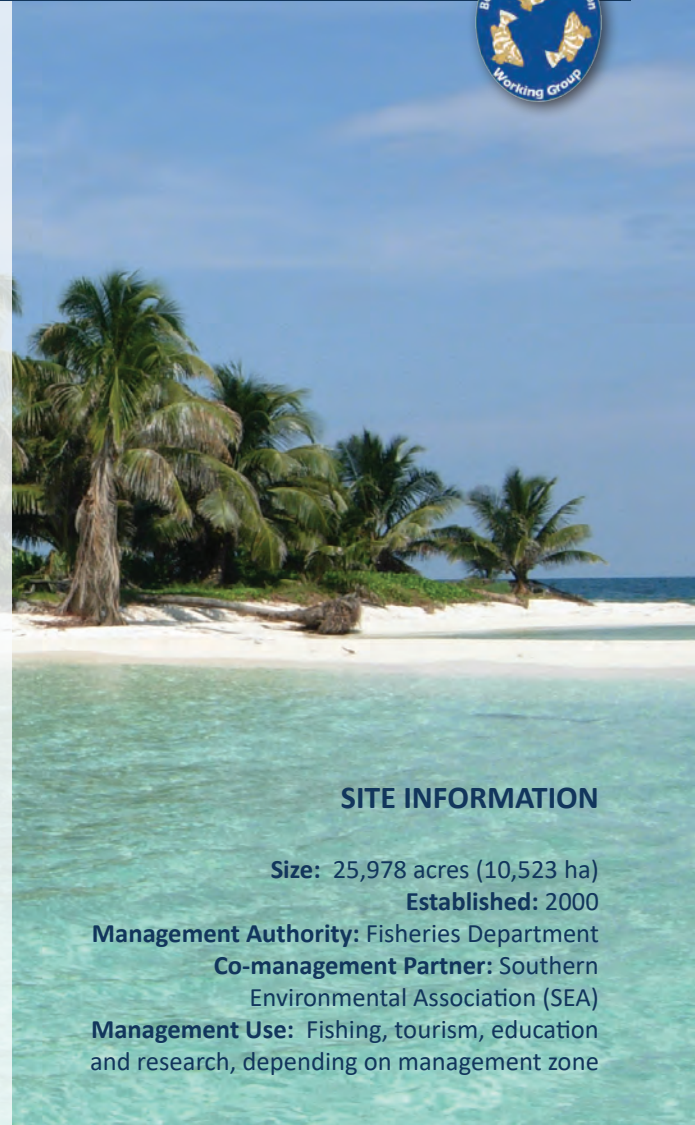
# Gladden Spit and Silk Cayes Marine Reserve



At Gladden Spit, the barrier reef turns 90 degrees, forming an elbow that drops to a depth of 250 metres to the east. This provides the conditions required for the regionally important Gladden Spit spawning aggregation site. Here, large numbers of Nassau grouper, mutton, dog and cubera snapper gather at full moon during April, May and June, attracting whale sharks, which feed on the fish spawn.

Gladden Spit and Silk Cayes Marine Reserve encompasses some of the best formed examples of barrier reef structure in the region, with extensive spur and groove formation, reef-crest, and back-reef. Seagrass beds and patch reef support many marine species key for maintenance of both commercial fishing and tourism industries. The large General Use Zone of the Marine Reserve is also important for lobster and conch fishermen from coastal communities throughout Belize.

To the west, the shallow sea is protected behind the barrier reef. The beauty of the Silk Cayes - three sand cayes (Northern, Middle and South Silk Caye), and the crystal clear waters surrounding them attracts visitors from the central coastal communities.



## SITE INFORMATION

**Size:** 25,978 acres (10,523 ha)

**Established:** 2000

**Management Authority:** Fisheries Department

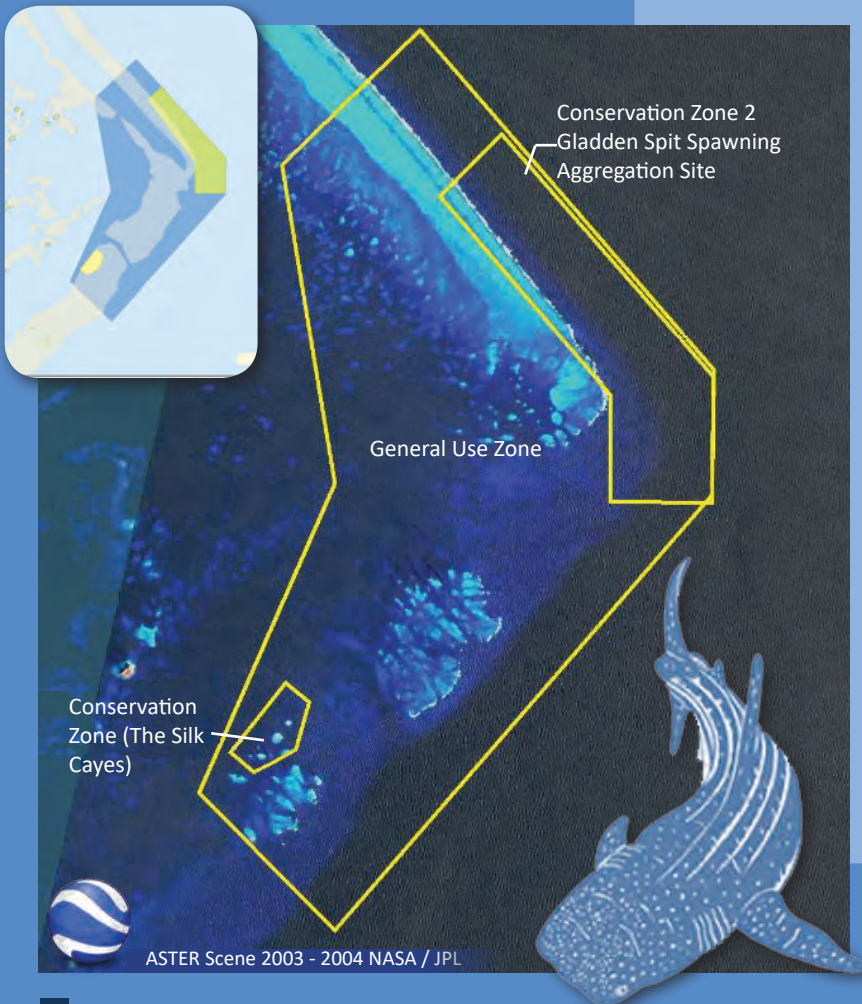
**Co-management Partner:** Southern Environmental Association (SEA)

**Management Use:** Fishing, tourism, education and research, depending on management zone

## KEY POINTS

- The Gladden Spit spawning aggregation site is important for maintaining commercial fish species in Belize
- The spawning aggregation site attracts whale sharks, an important tourism resource for Placencia. Over the past ten years, whale shark tourism has become a major part of Belize's tourism economy
- Gladden Spit is the only location in the world where visitors can predictably dive with these amazing fish
- Strict regulations are in place to protect the whale sharks
- The General Use Zone supports fishermen from coastal communities throughout Belize

***Gladden Spit  
Marine Reserve - home  
of the whale sharks***



### DID YOU KNOW...

The largest confirmed whale shark was 12.65 m (41.5 ft) long, and weighed about 21.5 t (47,000 lb). Unconfirmed reports, however, suggest that they may reach 18.2 m (60 ft).

## WHALE SHARKS

Whale sharks (*Rhincodon typus*), the world's largest fish, congregate at Gladden Spit each year to feed on the snapper spawning aggregation site during the ten days around the full moon between the months of March to July.

This endangered species occurs throughout tropical and warm temperate waters around the globe. It is highly migratory, travelling thousands of kilometres.

Despite its size, the whale shark is a filter feeder, swimming through the water with its mouth open, sucking in water and filtering out plankton and small fish as the water passes out through its gills.



## WHAT CAN I DO? WHERE CAN I DO IT?

### GENERAL USE ZONE

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 3.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets.
- Sport fishing is allowed with a permit.
- Tourism and recreational use is allowed, following BTB and zone regulations, and Whale Shark Tourism Interaction Guidelines.

### CONSERVATION ZONE I

- Replenishment zone around the Silk Cayes.
- No commercial, sport or subsistence fishing of any kind.
- Tourism and recreational use is allowed, following BTB and zone regulations.

### CONSERVATION ZONE II

- Closed to fishing from the 1st December to the 1st March.
- The Spawning Aggregation site itself is closed to fishing all year round.



# Laughing Bird Caye National Park



Laughing Bird Caye National Park is one of the seven protected areas that form the Belize Barrier Reef Reserve System - World Heritage Site. Declared in 1991, at the request of local tour guides, the park protected only Laughing Bird Caye itself at first. It was then expanded in 1996 to include the entire Laughing Bird Faro, with its fringing reef and central lagoon.

Laughing Bird Caye National Park is a major attraction for snorkellers and divers, and is an important destination for the tourism industry of the central Belize coastal communities – especially Placencia.

In keeping with its designation as a National Park, Laughing Bird Caye is a no-take area and serves as an important replenishment source for both lobster and conch, supporting the fishing industry in southern Belize. The high density of conch within the park demonstrates that no-take zones do work. As a result of the no extraction regulations, the waters of the National Park support extraordinarily high biological diversity, with other species such as spiny lobster and finfish also flourishing inside the park boundaries.

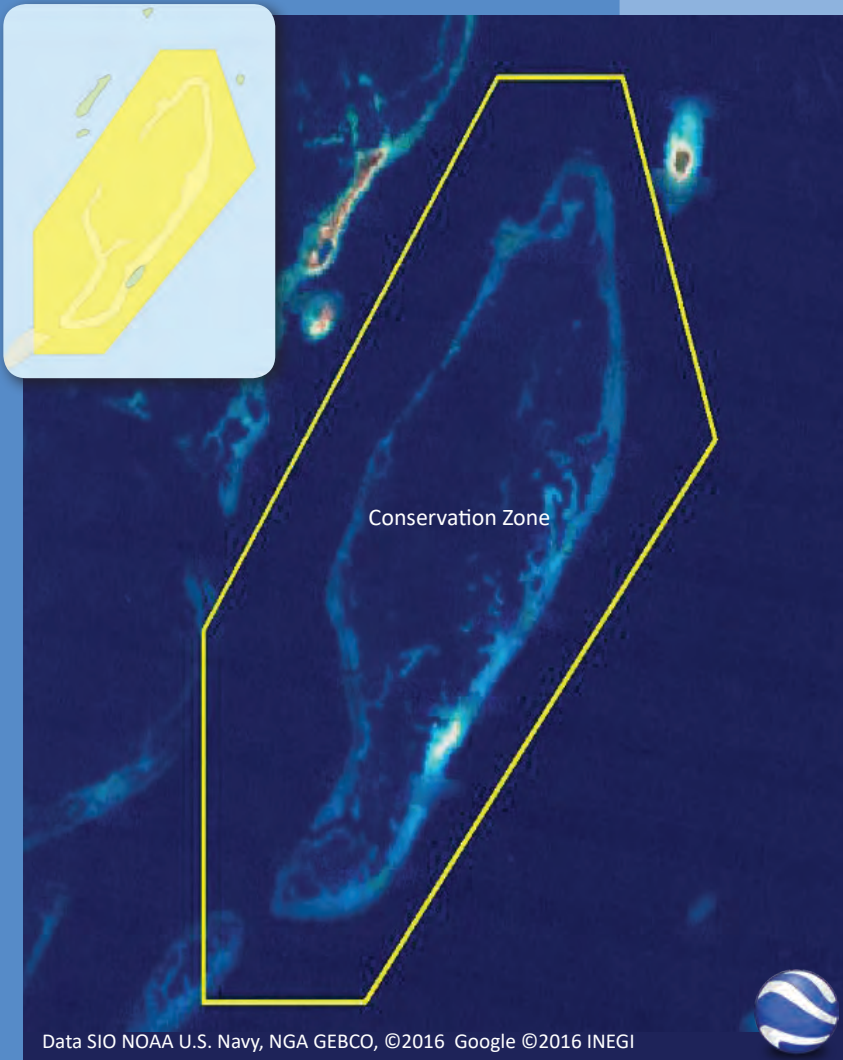
The Laughing Bird Caye National Park protects one of Belize's faros - a series of unusually steep-sided rhomboid reef systems found on the coastal platform in Southern Belize. These reef structures have been formed over the last 9,000 years, and are characterised by steep sided reef walls with dense networks of branching corals, with a growth rate estimated at 1.4 meters/millennium. These act as a physical barrier, forming the faro walls and trapping sediments.



## KEY POINTS

- One of seven protected areas that together form Belize's World Heritage Site - the Belize Barrier Reef Reserve System
- Provides an easily accessible tourism destination - Laughing Bird Caye is the closest sandy caye to the central Belize mainland, supporting the local tourism industry
- No-take area is recognized for supporting extraordinarily high biological diversity
- Important conch nursery area
- Provides nursery and feeding habitats for at least twenty three species of international concern
- Important educational destination for introducing school children to the reef ecosystems

***Laughing Bird Caye National Park - supporting the local tourism industry***



Data SIO NOAA U.S. Navy, NGA GEBCO, ©2016 Google ©2016 INEGI

## WHAT CAN I DO? WHERE CAN I DO IT?

### CONSERVATION

As a **NATIONAL PARK**, the Laughing Bird Caye is fully protected, and acts as a Replenishment Zone.

### REGULATIONS

- Non extractive use only.
- Recreational snorkelling and diving permitted.
- Boat mooring only at recognized mooring points.
- Education activities permitted.
- Authorised research activities permitted.

### PRESERVATION

- There is no access to the north end of the caye without permission.



## BUILDING CORAL RESILIENCE

Laughing Bird Caye National Park encompasses the entire Laughing Bird Faro, with fringing reefs and a central lagoon dominated by hardy coral species that can tolerate varying levels of salinity and turbidity. The lagoon waters heat up more than the coastal waters of the barrier reef, and corals have adapted to the increased temperatures. These conditions may result in corals that show greater resilience to climate change, contributing towards the long term viability of coral reefs in Belize.

The Fragments of Coral project identifies the more resilient coral species, and cultures them in the shallow waters of the faro lagoon, near Laughing Bird Caye. These more resilient corals can then be planted out in other parts of Belize to assist reefs in adapting to the increasing water temperatures.



## SITE INFORMATION

**Size:** 10,119 acres (4,095 ha)

**Established:** 1996

**Management Authority:** Forest Department

**Co-management Partner:** Southern Environmental Association (SEA)

**Uses:** Non-extractive – tourism, education and research



Annelise Hagan

# Sapodilla Cayes Marine Reserve



Sapodilla Cayes Marine Reserve is located at the southern end of the Belize Barrier Reef, where the reef makes a J-shaped hook, and is considered representative of the discontinuous reefs of the southern barrier reef. It is known for the sport fishing opportunities - particularly targeting bonefish, tarpon and permit

The protected coastal waters, with their scattered coral patches, provide nursery and feeding habitats for at least twenty five globally threatened species including five species of coral, three marine turtles, and fifteen species of fish. A number of the cayes provide nesting sites for hawksbill, green and loggerhead turtles, important to the survival of these species within the region.

Sapodilla Cayes Marine Reserve is also of economic importance to Belize as a lobster, conch and fin-fish resource for traditional fishermen from mainland fishing communities - particularly Monkey River, Punta Negra and Punta Gorda.

The Marine Reserve contains three nationally recognized and protected spawning aggregation sites - Nicholas Caye, Rise and Fall Bank and Seal's Caye. The locally known "Elbow," an aggregation site for mutton snapper, is not included within the legislation, and is popularly fished during the aggregations season.

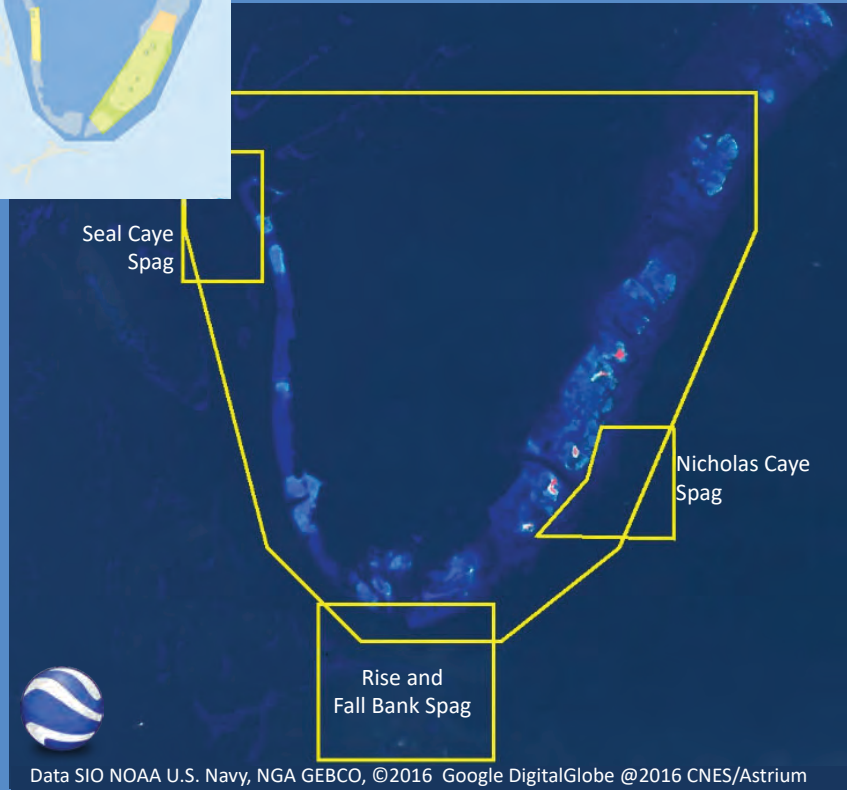


A. Tewfik/WCS

***Sapodilla Cayes Marine Reserve - idyllic sand cayes and world class sport fishing***

## KEY POINTS

- One of seven protected areas that together form Belize's World Heritage Site - the Belize Barrier Reef Reserve System
- A world class sport fishing destination, drawing sport fishers from around the world
- Idyllic sand cayes provide tourism destinations for reef-based tours, generating much needed income in southern Belize
- The cayes provide nesting beaches for three species of marine turtles
- Three spawning aggregation sites contribute to the long term viability of commercial fish species - snapper and grouper - in the region
- Provides a marine research base for the University of Belize



## WHAT CAN I DO? WHERE CAN I DO IT?

### GENERAL USE ZONE

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 4.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets.
- Sport fishing is allowed with a permit.
- Tourism and recreational use is allowed, following BTB and zone regulations.

### CONSERVATION ZONE

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- Tourism and recreational use is allowed, following BTB and zone regulations.
- Boats should use officially designated mooring buoys.
- Sport fishing is only allowed when 'catch and release'.

### PRESERVATION ZONE

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- No boat access unless authorized.

### SEASONAL CLOSURE

- Closed to fishing from the 1st December to the 1st March.
- The Spawning Aggregation site itself is closed to fishing all year round.

## SITE INFORMATION

**Size:** 38,595 acres (15,619 ha)

**Established:** 1996

**Management Authority:** Fisheries Department

**Management Use:** Fishing, sport fishing, tourism, education and research

# Port Honduras Marine Reserve



Port Honduras Marine Reserve provides one of the richest habitats within Belize, with coastal wetlands, mangrove cayes, seagrass beds and coral reefs.

The coastline of dense mangrove and the 138 small offshore mangrove cayes, linked by extensive seagrass beds. These serve as critical nursery and feeding areas for commercially important snapper and grouper, lobster and conch. Brightly coloured, charismatic parrotfish, critical for maintaining the health of the reef, use all three key habitat (mangroves, seagrass and coral reef). The seagrass supports part of Belize's Antillean manatee population.

This Marine Reserve protects resources that support the local fishermen - lobster and conch, snook and snapper. The accessible reefs and idyllic beaches of the Snake Cayes, supplemented by sport fishing, support a growing tourism industry. In the waters surrounding the Snake Cayes, the idyllic sandy beaches have been a traditional recreational area for families in southern Belize. reefs provide habitat for brightly coloured reef organisms. These reefs, near-shore fringing reefs, are unique in Belize, with characteristics of both inshore reef and offshore barrier reef environments.



## Key Points

- Managed as part of a connected, protected ridge-to-reef landscape/ seascape, from the Maya Mountains to the coral reefs
- Bordered by a pristine coastline, with interconnected mangroves, seagrass and reef, Port Honduras provides an important nursery area for commercial species, colourful touristic and key sport fishing species, as well as threatened species such as the Antillean manatee
- Highly productive marine life supports local fishermen, providing fish and other marine products for both home and commercial use
- Important to the local economy, providing a tourism resource that draws people to southern Belize, and supports a thriving sport fishing industry
- Regional model for innovative management, such as Managed Access, with management decisions based on sound science

***Port Honduras  
Marine Reserve -  
maintaining ecological  
integrity and traditional  
livelihoods in southern  
Belize***



Data SIO NOAA U.S. Navy, NGA GEBCO, ©2016 Google Image Landsat ©2016 Cnes/Spot Image

### WHAT CAN I DO? WHERE CAN I DO IT?

#### GENERAL USE ZONE

- Commercial fishing is permitted, with a Managed Access fishing license valid for Fishing Area 5.
- Gear restrictions apply: No use of long lines, spear guns or gill nets. No traps made with seine, cast nets, gill nets, trammel nets or tangled nets.
- Sport fishing is allowed with a permit.
- Tourism and recreational use is allowed, following BTB and zone regulations.

#### CONSERVATION ZONE

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- Tourism and recreational use is allowed, following BTB and zone regulations.

#### PRESERVATION ZONE

- Replenishment zone.
- No commercial or subsistence fishing of any kind.
- No recreational use.
- No boat access unless authorized.



## Ridge to Reef Connectivity

Port Honduras Marine Reserve is part of the Maya Mountain Marine Corridor, a connected landscape / seascape that stretches from the top of the Maya Mountains, across the coastal plain, to the coast and on to the reef, connected by the forests, streams and rivers that run through it.

The Marine Reserve focuses on the conservation of marine biodiversity within this landscape, with connectivity through the six watersheds that empty into it. This landscape includes the mosaic of mangrove, lagoon and savannahs of Payne's Creek National Park, the private protected areas owned and managed under TIDE and Ya'axché Conservation Trust, and the mountains of Bladen Nature Reserve, a national protected area.

The functions of the coastal basin and the extensive seagrass beds in filtering and settling out sediments and nutrients are critical for maintaining the health of the inshore Snake Cayes reef and the barrier reef further offshore – particularly that of the Sapodilla Cayes Marine Reserve, one of Belize's seven protected areas that combine to form Belize's World Heritage Site.

### SITE INFORMATION

**Size:** 100,000 acres (40,468 ha)

**Established:** 2000

**Management Authority:** Fisheries Department

**Co-management Partner:** Toledo Institute for Development and Environment (TIDE)

**Uses:** Fishing, tourism, education and research, dependent on management zone

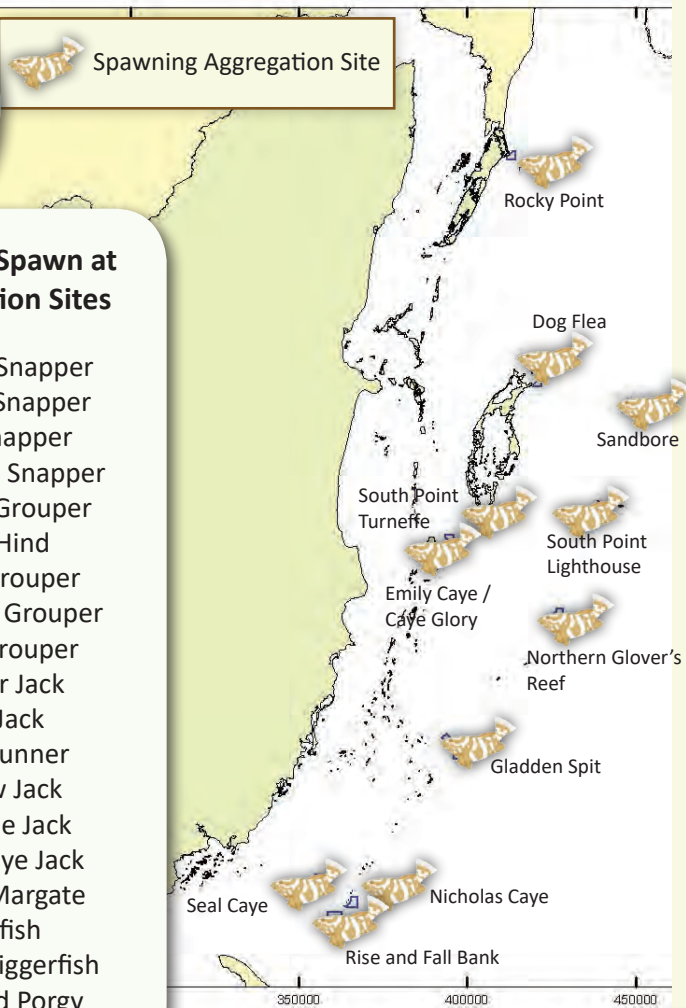
# Spawning Aggregation Sites

Spawning aggregation sites only form in certain water conditions on the reef drop off, and are critical for the maintenance of Belize's commercial fish. Historically, fish gathered in their thousands at the full moon to spawn - particularly snapper and grouper. These sites have declined significantly across Belize as a result of overfishing, leading to their protection.



## Fish that Spawn at Aggregation Sites

Mutton Snapper  
Cubera Snapper  
Dog Snapper  
Yellowtail Snapper  
Nassau Grouper  
Red Hind  
Black Grouper  
Yellowfin Grouper  
Tiger Grouper  
Amber Jack  
Bar Jack  
Blue Runner  
Yellow Jack  
Crevalle Jack  
Horse-eye Jack  
White Margate  
Hogfish  
Ocean Triggerfish  
Jolthead Porgy  
Permit



## KEY POINTS

- Eleven Spawning Aggregation Sites (SPAGs) have been protected in Belize since 2003 - the majority of the sites remaining currently known within Belize waters
- A further two sites (Mauger Caye (Turneffe Atoll) and Northern Two Cayes (Lighthouse Reef)), have seasonal protection for Nassau Grouper
- Protection of the SPAG sites is critical for maintaining commercial and sport fishing species that rely on large numbers of individuals congregating at SPAGs for successful reproduction
- Unregulated fishing of many of the sites before protection has reduced numbers to critically low levels - in the 1950's, annual catch was up to 100,000 pounds. However now, very few of the 13 historical sites have aggregations of more than 2,000 / 2,500 fish, and are therefore considered at risk

**Spawning Aggregation Sites - critical for maintaining snapper and grouper in Belize**

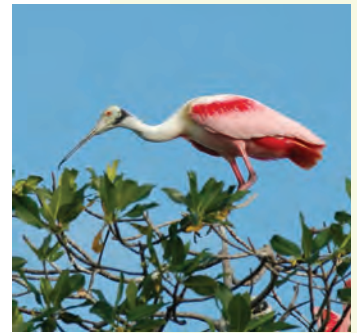
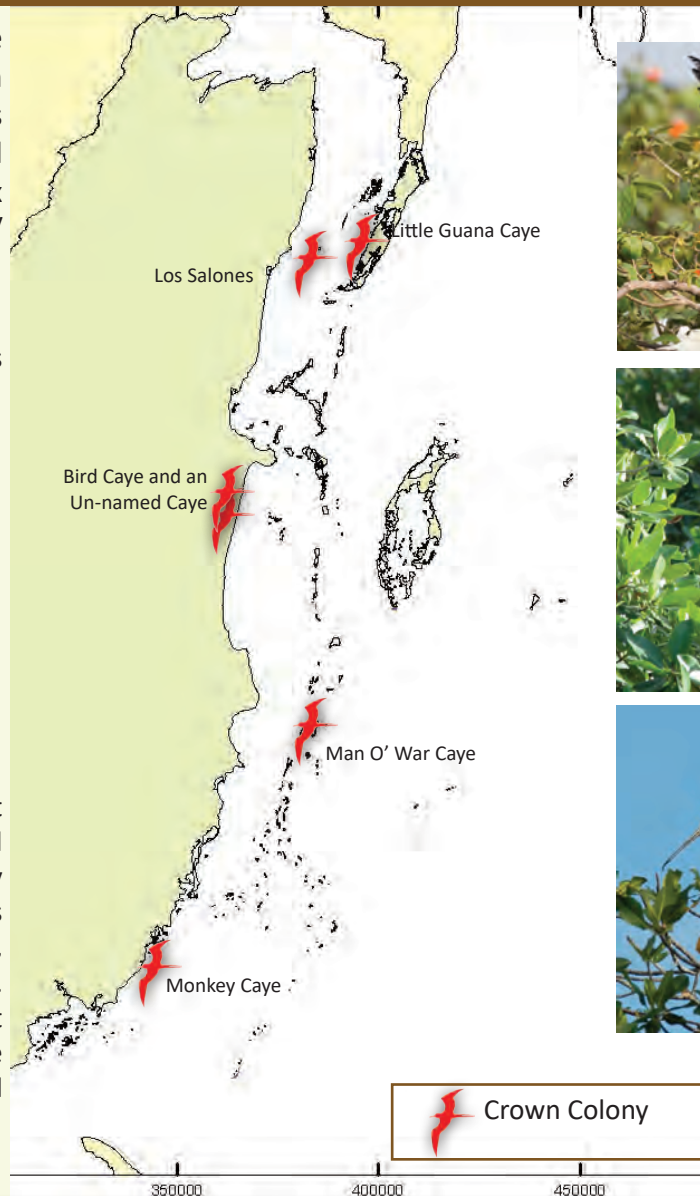
# Crown Colonies

Seven Bird Sanctuaries were designated in 1977 under the Crown Lands Ordinance, under the Lands Department, to protect critical nesting and roosting colonies. Six of these are located on the coast / in coastal lagoons.

Species that use coastal colonies include:

- Magnificent frigatebird
- Brown pelican
- Red-footed booby
- Reddish egret
- White ibis
- Roseate spoonbill
- Tricoloured heron
- Great egrets

There is no formal management of these cayes under the National Protected Areas System, unless they occur within other protected areas -as is the case with Man-O-War Caye, in South Water Caye Marine Reserve. Maintenance of these important colonies is also difficult as they change over time, with birds leaving old colonies and establishing new.



## KEY POINTS

- Colony nesting birds use mangrove cayes for safety, as the water surrounding the cayes prevents many predators from reaching the nests
- Nesting in large colonies, however, makes these species vulnerable to disturbance - a colony can be destroyed very quickly through clearance of the caye vegetation or by too much tourism visitation
- Seven sites were originally protected in 1977, but in reality, several of these no longer support colonies, and other sites are now more important, and in need of protection, e.g. Cayo Rosario, if Belize is going to maintain these species
- These birds are important for maintaining balance in the coastal ecosystem, and have great tourism value. Many of these birds move to feeding areas after breeding, such as Crooked Tree Wildlife Sanctuary
- Cayes are targeted for coastal development, reducing nesting site availability

***Crown Bird Colonies - an indication of the health of our coastal ecosystems***

The ocean touches you every day.  
With every drop of water you drink,  
Every breath you take,  
You're connected to the sea.  
No matter where on earth you live.

Sylvia Earle



# Threats to the Marine Environment

## LAND USE CHANGE

- Deforestation
- Changing rainfall and drainage patterns
- Removal of river bank vegetation, increasing erosion, with increased sediment load in rivers
- Filling wetlands

## UNSUSTAINABLE COASTAL DEVELOPMENT

- Clearing mangroves and coastal vegetation
- Filling wetlands
- Building coastal reinforcements that change coastal currents and erosion patterns
- Impacting turtle nesting beaches
- Impacting migratory birds

## CLIMATE CHANGE

- Increasing sea surface temperatures
- Increasing sea level
- Ocean acidification
- Increased intensity of storms

## POLLUTION

- Agro-chemical run-off, industrial / urban effluent, solid waste, sewage
- Sediment from erosion
- Use of sun screen and insect repellent near coral reefs
- Oil and gasoline from poorly maintained boat engines

## UNSUSTAINABLE FISHING

- Illegal fishing - under-sized product
- Out-of-season product
- Use of illegal fishing gear
- Fishing without a license
- Fishing in replenishment zones
- Illegal trans-boundary incursions

## INVASIVE SPECIES

- Lionfish
- Black tiger prawns

# Climate Change

The health of the marine environment is critical to the social and economic health of Belize. The ecosystem services provided by the coral reefs and mangroves, in particular, cannot be over-estimated. The support they provide for the fishing and tourism industries, and the protection they provide to coastal communities from tropical storms, have been critical in the development of Belize. ***Climate change places these ecosystem services at risk.***

## Belize: Predicted Climate Change Impacts

- Sea level rise
- Increased sea surface temperature
- Increased intensity of storms
- Ocean acidification
- Decreased precipitation
- Increased air temperature

*My fear is that, although the solutions are out there to make a better future, if we carry on with business as usual we will run out of time and the point of no return will come.*

*We've lost the wisdom of the indigenous people who make decisions based on asking, "How does this affect my people generations ahead?"*

**Jane Goodall**

## Increasing Sea Temperatures

***Water temperatures are predicted to increase by up to 5°C by 2080, causing:***

- Increased coral bleaching and eventual loss of reefs
- Increased coral disease
- Possible impacts from new invasive species and algal blooms
- Changes in localized current patterns, affecting marine life migration, spawning aggregation sites and larval dispersion



## Increasing Storm Intensity

***Storm intensity is predicted to increase, with more Category 4 and 5 storms, causing:***

- Increased damage to corals
- Increased sediments covering corals
- Heavy rains flush sediments and agro-chemicals from watersheds onto the reef
- Mixing of the shallow and deep water, cooling the coastal shelf
- Damage to coral structures



## SO HOW WILL CLIMATE CHANGE IMPACT THE PEOPLE WHO DEPEND ON THE BELIZE REEF?

### General

- Reduced health of coral reef as a result of increasing water temperature, ocean acidification and increased storm impacts
- Increasing salt intrusion into ground water; economic and health impacts from increasing droughts and flooding

### Fishery

- Declines in lobster, conch and finfish as reef health declines and ocean acidification increases
- Reduced income for the fishing industry and individual fishermen
- Increasingly strong tropical storms will increase damage to the reef, and result in fewer available fishing days, with an associated decline in income
- Shift to targeting off-shore species, requiring greater economic investment in more sophisticated equipment
- Increase in illegal fishing practices as fisher incomes decline
- A decline in coastal community economies, with increasing poverty

### Tourism

- Potential loss of charismatic reef species - parrotfish, corals, colourful fish and sharks
- Reduced tourism revenues from diving and snorkelling as aesthetic appeal of reef decreases
- Loss of sandy beaches, as sea level rises, storm activity increases and ocean acidification reduces sand production
- Increasing potential dredging activity for landfill as rising sea inundates cayes and coastline
- Declining tourism will affect coastal community economies
- Reduced income from tourism and reduced viable employment opportunities, increasing fishing pressures as tour guides switch back to fishing
- Increase in illegal fishing practices as personal incomes decline

### Key Ecosystem Services

- Long term loss of coastal protection from barrier reef and atolls if reef growth can't keep up with sea level rise
- Increased risk to coastline, coastal and caye infrastructure from sea level rise, increased storms and storm surges
- Increasing mechanical damage to reef



### Ocean Acidification

*Sea water has become 30% more acidic in the last 200 years, and this rapid shift is continuing*

- Predicted 35% reduction in coral growth by 2100
- Conch and other similar marine life will find it more difficult to build their shells, using more energy
- Marine life that requires calcium for shells - conch, coral etc. will produce smaller, weaker shells
- Planktonic organisms that form the base of the marine food chain may disappear, causing the coral reef system to collapse



### Sea Level Rise

*Sea level is predicted to rise by between 22 and 38 cms by 2050, dependent on the climate change scenario used, causing:*

- More frequent, and eventually permanent, flooding of cayes and coast
- Sea depth increases, with reduced light availability for corals and seagrass
- Potential for death of barrier reef, leading to exposure of coastline to ocean waves, and increased erosion

# Land-based Pollution

Land based pollution includes solid waste (garbage) and contamination of water (pollution), with impacts on the coastal waters and coral reef. Sediment, urban and agrochemical contamination from herbicides and pesticides, washed into rivers from the mainland watersheds, have been highlighted as perhaps the greatest impacts on the Belize reef after climate change. As agriculture and urban areas expand, the trend is for land-based pollution to also increase.

**Northern Belize:** Agrochemical pollution in the rainwater runoff from the sugar cane, rice and cattle areas, is impacting water quality. Two primary rivers – the Rio Hondo and the New River – drain the farmlands and flow into Corozal Bay, part one of the largest estuary systems of the Mesoamerican reef system. Coastal communities in Belize are small, but Chetumal, on the Mexican side of the trans-boundary estuary, has a population of over 150,000, with sewage treatment limitations, resulting in much of its raw sewage going into the sea. The estuary acts as a settling pond and filtration area for many of the contaminants and sediments before the water flows out onto the reef. However, this also leads to high levels of pollution in the estuary itself.

**Central and Southern Belize:** Agrochemicals are generally associated with the citrus and banana industries, and enter the rivers after heavy rain, exacerbated by the clearance of riverine vegetation. In the south, five major watersheds drain some of the principal banana growing areas. Following storm events, the increased sediment load of these rivers is also accompanied by an increased pesticide load, as rain washes agrochemicals from the watersheds into the rivers, and from there into the sea.

The Belize River originates in the Chiquibul area and passes through Guatemala before returning to Belize. Land-based pollution from Belize is, however, overshadowed by the watersheds emptying into the Gulf of Honduras, from Guatemala and Honduras (particularly the Ulua, Motagua, Patuca and Aguan) where land use change has removed much of the natural vegetation from the formerly forested slopes, and replaced it with agriculture.

## *What Can I do?*

### ***As a Belizean***

- Dispose of your garbage properly

### ***As a Farmer***

- Ensure you are informed about best use of agrochemicals
- Maintain a buffer of natural vegetation between agricultural areas and water ways (streams, creeks and rivers)
- Do not wash spray units in streams, rivers or lagoons
- Dispose of agrochemical containers carefully

### ***As a Home or Business Owner***

- Ensure your septic system is effective, and doesn't contaminate the soil
- Ensure you use an official dump site for your garbage



# Unsustainable Coastal Development

The coastal shorelines and cayes are the most vulnerable areas of Belize - targeted for coastal development, particularly for tourism and retirement communities. As a result, loss of coastal ecosystems - mangroves and beach vegetation - is accelerating as the developmental value and demand for beach frontage escalates. This results in increased beach erosion, beach loss, caye destabilization, and increased sedimentation impacts on the reef. Mangrove nursery areas are lost, seagrass dredged and even coral is mined to provide fill for low cayes.

## *What Can I do?*

### *As a Developer*

- Be informed - ensure you know the environmental regulations
- Ensure that your construction is to the highest environmental standards, that your Environmental Impact Assessment (EIA) identifies best practices / mitigation actions, and that environmental impacts are minimised
- Find alternatives for site-specific impacts to turtle nesting beaches, key fish nursery mangroves / lagoons and critical bird nesting colonies

### *As a Property Buyer*

- Be informed - ask about the environmental footprint, and what measures have been taken to prevent environmental impacts
- Learn more about maintaining a positive environmental footprint - leave the mangroves and beach vegetation, plan lighting for minimal impacts on turtles

# Potential for Oil Spills

## *Deep Water Horizon Oil Spill by numbers...*

- **4.9 million barrels of oil spilled into the Gulf of Mexico**
- **11 people dead**
- **170 miles of shoreline affected**
- **US\$25 billion spent on clean up**
- **US\$2.5 billion impact on the fishery**
- **US\$23 billion estimated impact on tourism impact over the first three years**

## *Can we afford this?*

The potential impacts of oil exploration and extraction, particularly in the marine environment in Belize has raised concerns of both non-governmental organizations and the general public. It is recognised that Belize does not currently have the capacity to cope with an incident such as the Deep Water Horizon oil spill, should it occur in Belize's territorial waters.

## *What Can I do?*

### *As a Belizean*

- Be informed - know the potential impacts of seismic testing, of oil drilling and potential for oil spills
- Ask the right questions
  - How well prepared is Belize for responding effectively to an oil spill in the marine environment?
  - Do the benefits to the Belizean people from oil outweigh the benefits of tourism and fishing?

“dead baby dolphins were washing up along the Mississippi and Alabama shorelines at about 10 times the normal number for the first two months of the year...”(..after the oil spill)

# Unsustainable Fishing

Commercial fishing focuses primarily on the lobster and conch fishery. In the past, open access has led to too many fishermen going after too few lobster, conch and finfish. This is made worse by transboundary incursions, limited financial and human resources for effective surveillance and enforcement, and reduced reef health – the last is a result of the combined impacts of past fishing of critical fish species such as parrotfish, land-based pollution and climate change.

Unsustainable fishing is being addressed through the introduction of Managed Access, a rights-based fishing regime. Managed Access supports fishermen that traditionally use specific marine areas, and provides them with preferential access, building ownership of the resource and vested interest in effective management of the protected areas. Improved stewardship will result in increased catch size, improved incomes and larger fish.

## *What Can I do?*

### ***As a Belizean,***

- Be informed - buy from a sustainable source - from a licensed fisher who follows best practices
- Look for the Fish Right - Eat Right sticker when you buy fish from a shop or go to a restaurant. Ask whether the fish is sustainably harvested
- Buy only lobster, conch and finfish that is a legal size, legal species and in season
- Don't encourage the fishing of under-sized grouper or snapper - or very large fish... these should be left to replenish the fish stocks

### ***As a Fisher***

- Fish sustainably - think about the future
- Fish legally - ensure you have the correct licenses and permits for yourself, your boat and your gear
- Leave the parrotfish - these are critical for keeping the reef healthy
- Leave the largest fish - these produce the most eggs and will ensure that you have fish in the future
- Don't fish in the Conservation and Preservation Zones of marine protected areas - follow the protected area regulations - they are there to help ensure that the fishery is sustainable

### ***As a Sport Fishing Guide / Sport Fisher***

- Follow catch and release best practices
- If fishing in a marine protected area, follow the regulations
- Ensure you have the correct licenses for yourself and your boat

### ***As a Restaurant / Hotel Owner***

- Be informed - buy from a sustainable source - from a fisher who follows best practices
- Only buy lobster, conch and finfish that is legal size, legal species and in season
- Be certified as part of the Fish Right -Eat Right campaign



# The Future...

Belize is considered a leader in the region - an inspiration to other countries when it comes to protected areas and protected area management. It has established a strong co-management framework, partnering effectively with non-governmental and community based organizations; rolled out Managed Access as a rights based fisheries management system, providing fishermen with incentive to become better stewards of their marine resources; placed a national ban on fishing of parrotfish in recognition of their role in maintaining the health of the reef; maintained the majority of the watersheds in a near pristine condition, ensuring continued water security; and become the first country to have certified its shrimp industry to international environmental standards. Belize has a lot to be proud of.

Throughout Belize there are individuals, community groups, fishing and tour guide associations implementing inspirational projects that improve sustainable use of the natural resources. These projects are supported by national funding through the Protected Areas Conservation Trust (PACT), and international investment from the Community Management of Protected Areas Conservation Programme (COMPACT) a special programme of the Global Environment Facility Small Grants Programme, implemented by the United Nations Development Programme (UNDP). Funding is also through the Global Environment Fund - Small Grants Programme, OAK Foundation, the World Wildlife Fund, Environmental Defense Fund, the Australian Agency for International Development (AusAID), and the Meso-American Reef Fund / Kreditanstalt fuer Wiederaufbau (MARFund / KfW).



## GLOBAL LEVEL

### **Sustainable Development Goals**

A commitment from the World's countries towards greater sustainability.

SDG 14: CONSERVE AND SUSTAINABLY USE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

## NATIONAL LEVEL

### **Growth and Sustainable Development Strategy**

Belize's national development plan - part of Horizon 2030.

Action 3.1.5: Marine and Aquatic Resources Belize's marine and aquatic resources are among its most valuable assets, both for tourism and for the provision of fish and other economic benefits.

Action to protect, sustain and sustainably use these resources are of the highest priority.

## NATIONAL LEVEL

### **National Biodiversity Strategy and Action Plan**

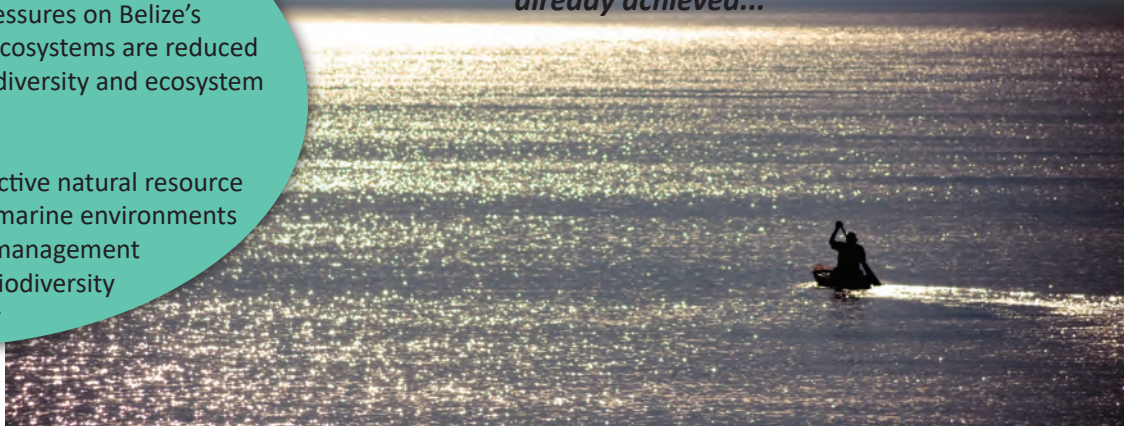
GOAL B: Direct and indirect pressures on Belize's marine, freshwater and terrestrial ecosystems are reduced to sustain and enhance national biodiversity and ecosystem services

TARGET B1. By 2020 primary extractive natural resource use in terrestrial, freshwater and marine environments is guided by sustainable management plans, with improved biodiversity sustainability

Advocacy partners such as Oceana and the Association of Protected Areas Management Organizations (APAMO) provide a voice for public concern, whilst public sector departments - the Fisheries and Forest Departments, Department of the Environment and the Pesticide Control Board ensure that the legislative and regulatory framework is in place to manage environmental impacts. The Coastal Zone Management Authority and Institute (CZMAI) provides recommendations for balancing coastal and caye development with environmental sustainability.

These broad sector partnerships strengthen the potential for future environmental sustainability in the marine environment, and management of land-based impacts.

***Despite the continued threats to our marine resources, we should never forget what Belize has already achieved...***



“SEAWEED! SEAWEED!!”

Twenty years ago, the streets of Belize City rang with the sound of street sellers advertising their wares - bottled seaweed shake.

Nutritious and tasty, the drink was sold throughout Belize - until over-extraction led to a decline of the local industry. Since then, the international market for seaweed has grown exponentially, and fishermen in Placencia are now establishing environmentally sustainable seaweed production.



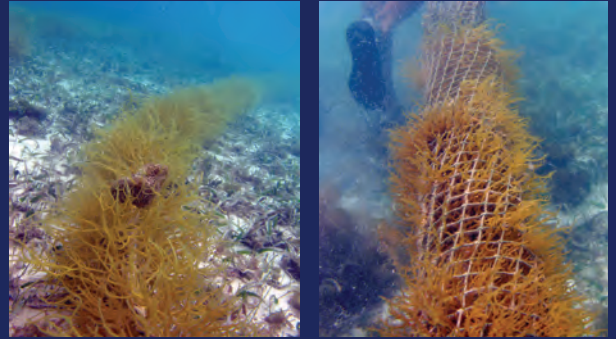
Fishermen of the Placencia Producers Cooperative Society Ltd. (PPCSL) are successfully farming seaweed in the shallow, clear waters adjacent to Little Water Caye. It is harvested by hand, and dried in the sun, to be sold as dried seaweed, or processed to form a seaweed gel, used in seaweed shakes and as a thickener in cooking. Seaweed gel can also be used in cosmetics and soap - an avenue currently being explored by the seaweed growers.

Both dried seaweed and seaweed gel have received significant attention, both in Belize and abroad, with the identification of a lucrative export market.



## Project Facts

Creating alternatives to unsustainable fishing is important - and seaweed farming is proving to be a viable alternative. Seaweed farming builds on the existing skills and knowledge of the fishermen and their understanding of the sea, while providing income diversification for those fishermen involved.



The seaweed occurs naturally in Belize. Seaweed fragments are tied to 50' long ropes or placed in nets, stretched out across the sea floor, and weighed down with anchors. These seaweed farms have a very small environmental footprint, and provide additional habitat for juvenile lobster, squid, shrimp, fish and other marine life.



The seed stock is left to grow for three months. 75% of the seaweed is then harvested quarterly by hand, the remaining being left to regrow.



The seaweed is dried in the sun, then soaked overnight in water, forming a gel for use in seaweed shakes and as a thickener in cooking. It can also be used in cosmetics and soap - an avenue currently being explored by the seaweed growers.

## Building Resilience in Belize's Reefs

Belize's reefs form the foundation for support of both the fishing and the tourism industries - important in the maintenance of coastal communities. They provide an ecosystem for many colourful fish and provide storm protection for Belize's cays and coastline. However, in the last thirty years, coral health has declined significantly. How can Belize reverse this trend?



Fragments of Hope is a community-based not-for-profit organization registered in Belize, that works closely with the Belize Fisheries Department. Led by Lisa Carne, it identifies resilient corals - those that are tolerant of rapidly changing water temperatures. Fragments are collected and cultured on ceramic discs, ropes or steel rods in the clear, sheltered waters of selected nursery areas across Belize.



The coral fragments are kept clean of algae and clear of predators (such as coral-eating snails), and allowed to grow until they are ready to plant out. They are then transplanted to sites in Laughing Bird Caye National Park and Gladden Spit and Silk Cayes Marine Reserve, where they play an important part in building resilience to climate change. South Water Caye and Turneffe Atoll Marine Reserve are also identified as sites for future transplants.



Resilient corals planted out in 2010 are already spawning, providing the parent stock that has the potential to assist in the future recovery of reefs throughout Belize.



Healthy reefs depend on healthy coral...but live coral cover has fallen from 50% in the 1970's to 10% today, with reefs becoming dominated by algae.

The reef building Elkhorn and Staghorn corals are considered Critically Endangered on a regional scale - one step away from extinction. These corals, once so common in the Caribbean, have declined by more than 98% in the last 30 years. Causes for this decline include:

- overfishing of the herbivorous fish that clean the reef
- declining water quality in areas of unregulated agricultural and coastal development
- poor tourism practices
- warming of coastal waters, resulting in widespread coral bleaching and increased coral disease

BELOW: A Fragments of Hope outplant area of coral transplants



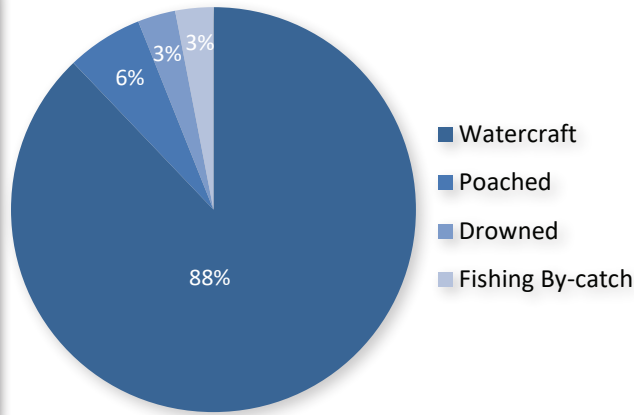
The sheltered coastal waters of Belize provide a haven for the gentle Antillean manatees, with a population estimated at around 1,000 individuals - a large part of the Meso-American reef population of an estimated 2,500. However, there are concerns about the increasing number of dead manatees being reported with deep cuts from boat propellers, particularly in the Belize City area. These deaths also result in orphaned calves - weak, washed ashore, scratched, dehydrated and often emaciated. Jamal Galves, of Sea to Shore, is the man

called to respond to manatee issues, and rescues injured individuals or orphaned calves in need of help.

## Why are manatees dying in Belize?

Between 2012 and 2013, 82 manatees were confirmed as dead. Of these, cause of death is known for 33 animals - 88% of these were caused by boats, many in the Belize River.

**In 2015, 49 manatee deaths were confirmed.**



“As a child I would have never thought that these gentle mammals were becoming an endangered species. I was a kid who grew up in an area considered to be a haven for manatees, yet it never occurred to me that I would spend a lifetime trying to conserve this species. I have come to the realization that the importance of manatees extends beyond conservation; they are not just gentle marine mammals, but also important components of our country’s ecosystems and natural beauty.”

*Jamal Galves*



*Jamal Galves  
The Man Who saves Manatees*



## Saving Manatees

The Belize Marine Mammal Stranding Network, managed under the National Manatee Working Group, responds to reports of injured or dead manatees. Members respond to reports from the general public, rescuing abandoned calves and conducting necropsies of dead animals to determine cause of death. Manatee response is led by Jamal Galves, who has become increasingly well known in Belize as the “Man Who Saves Manatees”.

Belize has one of the region’s few Manatee Rehabilitation Centres, hosted by Wildtracks. Orphaned calves and injured adults rescued by the Marine Mammal Stranding Network are transported to the Centre, where they are provided with the care they need to prepare them for life back in the wild.

### What Can I do?

#### Are you a Boat Captain?

- Follow the regulations in “No Wake” zones established in key manatee areas.
- Watch out for manatees when travelling in shallow, coastal waters, especially near Belize City.
- Slow down if you see a manatee in the water near you.

#### Are you a tour guide?

- Ensure your visitors do not enter the water to swim with, touch or otherwise disturb manatees.
- Never provide food for manatees.

#### Are you a fisherman?

- If you are setting nets, do it legally, and watch them carefully to make sure they don’t trap manatees.
- If you see an injured manatee or manatee calf on its own, call the hotline:

**615-3838 or 650-6578**

## MANATEE REGULATIONS IN BELIZE

### UNDER THE WILDLIFE PROTECTION ACT...

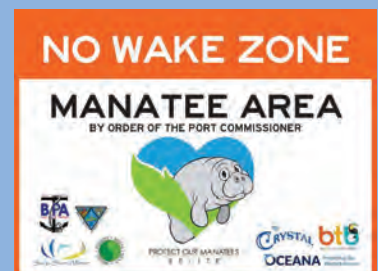
- It is illegal to kill, harass or molest a manatee (Forest Department)

### BOATING REGULATIONS IN KEY MANATEE AREAS

Posted in an area that frequently has manatees, requiring caution on the part of boaters to avoid disturbing or injuring the animals.



A key manatee area where boats must be fully off plane and completely settled and level in the water while moving



Lowest speed needed to maintain steering and forward motion. The vessel should not cause a wake at this speed.



Resume normal, safe speed according to current water traffic conditions.



Sarteneja, a traditional fishing community on the north coast of Belize, is one of the primary stakeholders of the Belize Barrier Reef. The economic foundation of the community is based on the traditional harvesting of marine resources. More than 70% of households are dependent on fisheries resources – principally through fishing for lobster, conch and finfish, but more recently, also through fly-fishing and reef tourism.

This reliance creates a strong relationship between the state of the resource and the needs of the community. Families in the community have recognised the need to diversify away from household incomes that are entirely dependent on fishing. They have taken the lead with the establishment of a number of allied community groups that support each other and work closely together to promote cooperation and collaboration towards sustainable development of their community.



### **Sarteneja Fishermen Association (SFA)**

Registered: 2007

Membership organization of 140 reef fishermen and 9 women

*The Sarteneja Fishermen Association is a community based membership organization that works on behalf of the fishermen of Sarteneja and the other northern fishing communities towards responsible and sustainable development, seeking to represent the fishermen, and providing them with opportunities for developing sustainable alternative livelihood options.*



### **Sarteneja Tour Guide Association (SFA)**

Registered: 2007

Membership organization of 45 active tour guides.

*To represent the tour guides of Sarteneja, and provide an environment for the development of sustainable, environmentally-aware tourism, in which the community can develop as a tourism destination, and in which tour guides can be employed as an alternative to traditional fishing, reducing the pressure on Belize's Barrier Reef.*



### **Sarteneja Alliance for Conservation and Development (SACD)**

Registered: 2008

Non-profit Organization - Manager of Corozal Bay Wildlife Sanctuary, in partnership with the Belize Forest Department, and with the technical support of the Belize Fisheries Department.

*The Sarteneja Alliance for Conservation and Development is a community-orientated, non-profit organization dedicated to improving the quality of life of Sartenejeños through strengthening mechanisms for collaboration, support and community engagement; and through the promotion of the sustainable use of the Corozal Bay Wildlife Sanctuary.*



***These three organizations have worked together for almost ten years, moving towards their vision of:***

***Sarteneja - the recognised community-based tourism destination in northern Belize, rich in culture, traditions and natural resources....a unified, environmentally aware community, ensuring shared sustainable economic opportunities for its people.***



## **What are the benefits of working together?**

Community capacity is based on a number of criteria – perhaps most important is the ability of a community to organize itself and build networks of individuals, associations and organizations. Working together as an Alliance, the three well-established organizations of Sarteneja – SACD, STGA and SFA - strengthen each other significantly, with SACD providing a mechanism for effective collaboration, communication and networking.

As members of the Alliance, partners have been able to participate in capacity building workshops covering basic project management, accounting, presentation skills and monitoring and evaluation. By sharing resources - office space, utility and internet costs - they have been able to be more cost effective. The open communication ensures coordinated implementation of community activities, and the organizations provide support to each other to ensure effective project implementation, best practices and transparency.

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### **THE LIONFISH LADIES**



*Photo: Blue Ventures Conservation*

A group of 19 women from seven of Belize's coastal communities, including Sarteneja, have developed a business - Belize Lionfish Jewellery - making beautiful jewellery from the fins, tails, and spines of the lionfish. This invasive fish species arrived in Belize's waters in 2008, and has been spreading and increasing. It is a cause for concern as it eats juvenile commercial species, posing a threat to the livelihood of Belize's fishers, and out-competes native fish.

Now that lionfish are established, Belize will never be able to remove this fish from the reef. The most effective solution to the problem is to catch and eat as many as possible. Fishers have been fishing lionfish for several years, throwing away the colourful tails, fins, and spines as they prepare fillet. Now, however, the women are adding value to fishers catch by purchasing the previously discarded fins, tails and spines and turning them into jewellery.

Registered as an official business entity in 2015, the group has benefited from training and facilitation by Blue Ventures Conservation and the Sarteneja Fishermen Association. The women have learnt not only how to make the jewellery but now also have the business and marketing skills to be successful at selling. This is empowering the women as income earners for their households, as well as contributing to lionfish control efforts and reef conservation.

#### **BELIZE LIONFISH JEWELLERY**



*Photos: Blue Ventures Conservation*

# The Belize Barrier Reef Reserve System

## A World Heritage Site of Outstanding Universal Value

### UNESCO: WHS: A Brief synthesis

The Belize Barrier Reef Reserve System (BBRRS), inscribed as a UNESCO World Heritage Site in 1996, is comprised of seven protected areas; Bacalar Chico National Park and Marine Reserve, Blue Hole Natural Monument, Half Moon Caye Natural Monument, South Water Caye Marine Reserve, Glover's Reef Marine Reserve, Laughing Bird Caye National Park and Sapodilla Cayes Marine Reserve. The largest reef complex in the Atlantic-Caribbean region it represents the second largest reef system in the world. The seven protected areas that constitute the BBRRS comprise 12% of the entire Reef Complex.

The unique array of reef types within one self-contained area distinguishes the BBRRS from other reef systems. The site is one of the most pristine reef ecosystems in the Western Hemisphere and was referred to 'as the most remarkable reef in the West Indies' by Charles Darwin. Outside of the reef complex the property contains three atolls; Turneffe Island, Lighthouse Reef and Glover's Reef. The Barrier Reef and atolls exhibit some of the best reef growth in the Caribbean. The reef complex is comprised of approximately 450 sand and mangrove cayes.

The property provides important habitat for a number of threatened marine species, harbouring a number of species of conservation concern including the West Indian manatee (*Trichechus manatus*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), and the American crocodile (*Crocodylus acutus*) as well as endemic and migratory birds which reproduce in the littoral forests of cayes, atolls and coastal areas. Major bird colonies include the red-footed booby (*Sula sula*) on Half-Moon Caye, brown booby (*Sula leucogaster*) on Man O'War Caye and the common noddy (*Anous stolidus*) on Glover's Reef. Approximately 247 taxa of marine flora have been described within the complex and over 500 fish, 65 scleritian coral, 45 hydroid and 350 mollusc species have also been identified, in addition to a great diversity of sponges, marine worms and crustaceans.

Criterion (vii): The Belize Barrier Reef Reserve System (BBRRS) is unique in the world for its array of reef types contained in a relatively small area. As the longest barrier reef in the Northern and Western Hemispheres and distinctive on account of its size, array of reef types and the luxuriance of corals thriving in a pristine condition it provides a classic example of the evolutionary history of reefs and reef systems. The rise and fall of sea level over the millennia, coupled with natural karst topography and clear waters, results in a diverse submarine seascape of patch reefs, fringing reefs, faros, pinnacle reefs, barrier reefs as well as off-shelf atolls, rare deep water coral reefs and other unique geological features such as the Blue Hole and Rocky Point where the barrier reef touches the shore. The spectacular picturesque natural setting of brilliant white sand cayes and verdant green mangrove cayes is in dramatic contrast to the surrounding azure waters.

Criteria (ix): Illustrating a classic example of reef types, including fringing, barrier and atoll reef types, the BBRRS contains an intact ecosystem gradient ranging from the terrestrial to the deep ocean. Including littoral, wetland, and mangrove ecosystems, to seagrass beds interspersed with lagoonal reefs, to the outer barrier reef platform and oceanic atolls, this ecological gradient provides for a full complement of life-cycle needs, supporting critical spawning, nesting, foraging, and nursery ecosystem functions. Maintaining these ecological and biological processes ensures robust and resilient reefs, which are themselves one of the world's most ancient and diverse ecosystems.

Criteria (x): Home to a diverse array of top predators, on land, sea and in the air, the jaguars of Bacalar Chico, the great hammerheads of the Blue Hole, and the ospreys of Glovers Reef are a testament to the property's importance and its ecological integrity. A total of 178 terrestrial plants and 246 taxa of marine flora have been described from the area while over 500 species of fish, 65 scleractinian corals, 45 hydroids and 350 molluscs have been recorded. Numerous endangered species are protected within the boundaries of the BBRRS including; the West Indian manatee, the American crocodile and three species of sea turtle. The property also provides valuable habitat for three species of groupers, and the red-footed booby. The BBRRS is also home to endemic species including several Yucatan birds, island lizards, several fishes, tunicates, and sponges, making it an area with one of the highest levels of marine biodiversity in the Atlantic.

## **Integrity**

The Belize Barrier Reef Reserve System is one interconnected system comprised of seven marine protected areas located along the length of the barrier reef, the shelf lagoon and offshore atolls. It is the largest barrier reef in the Northern hemisphere and represents all the main reef and coastal habitats, including rare littoral forest on sand cayes that are home to endangered flora and fauna. The network of protected areas is large enough to maintain the necessary ecological processes and support the BBRRS for the long term. Its geographic spread and diversity enhance its resilience, an essential factor in this time of climate change with its risks of coral bleaching, stronger and more frequent hurricanes and sea level rise.

Management challenges and threats that impact on the integrity of the property include; overharvesting of marine resources, coastal development, tourism, industrial development and proposed oil and gas exploration and exploitation. These threats, common to marine protected areas in general are less intense due to relatively low population pressure, however, careful management is required to ensure growing population pressures do not lead to significant impacts on the integrity of the property.

## **Protection and management requirements**

Extending from the border with Mexico to the north, to near the Guatemalan border to the south the geographical spread of this serial property poses a number of management challenges. The component sites of the serial property have been gazetted as protected areas with legal protection measures provided under the national constitution, the Fisheries Act and the National Parks Act. Oversight of all protected areas, including the BBRRS, is governed through various pieces of legislation administered by various Government of Belize Departments spread across various Ministries.

The National Protected Areas Policy is Belize's policy on protected areas and provides the overarching policy framework, whereas the National Protected Areas System Plan details inter alia specific requirements for protected areas resource management, planning and management effectiveness evaluations. In addition to entrance fees, financial support for all protected areas in Belize can be accessed through the national Protected Areas Conservation Trust. Those sites and co-managers that constitute the BBRRS can also access funding from the Global Environment Facility Small Grants Programme and other international funding sources.

Government authorities have approached the management challenges posed by the size and nature of the property strategically, establishing innovative co-management agreements with various non-governmental organizations. This helps to ensure successful on-the-ground supervision, backed up by national legislation and guided by official management plans that are available for each of the component protected areas and include resource protection, research and monitoring, surveillance and enforcement, community outreach and education, and financial sustainability. However, the complexities of managing a number of protected areas spread over a considerable area requires detailed institutional coordination mechanisms to ensure the protection of the property and its Outstanding Universal Value.

Coordination amongst government agencies responsible for coastal development, including activities such as mangrove clearance and dredging, is required for conservation and effective management of the property. Revitalization of the Coastal Zone Management Authority and Institute (CZMAI), will strengthen this crucial element of integrated coastal management, particularly through the completion and legal adoption of the Coastal Zone Management Plan. Implementation of this Plan will assist with control, regulation, mitigation and minimizing threats such as uncontrolled development, unsustainable tourism and fishing, and declining water quality. Belize's long history of marine species conservation, trans-boundary coastal management cooperation, and involvement in several regional conservation initiatives is based on a recognition of the fact that the seas and resident wildlife are not confined to protected areas or within political boundaries, further enhances the conservation of the BBRRS WHS.

Strengthening of mangrove regulations, the fisheries and marine reserve regulations, and the Environment Impact Assessment process will lead to more sustainable use of resources both within the BBRRS and the surrounding areas. Policy development and contingency planning are required for impacts of possible oil and gas exploration located outside the property, impacts from tourism and to address climate change concerns. Along with these regulatory and policy improvements, strengthened enforcement will also assist in management and long-term protection of the property. Added protection and management measures, and the ongoing dedication and coordinated work of government and non-government organizations, will ensure the outstanding values of the BBRRS will remain intact.

***This project would not have been possible without the support of the  
Small Grants Programme (SGP)***

***“The Small Grants Programme (SGP) is a corporate programme of the Global Environment Facility (GEF) implemented by the United Nations Development Programme (UNDP) since 1992. SGP grantmaking in over 125 countries promotes community-based innovation, capacity development, and empowerment through sustainable development projects of local civil society organizations with special consideration for indigenous peoples, women, and youth. SGP has supported over 20,000 community-based projects in biodiversity conservation, climate change mitigation and adaptation, prevention of land degradation, protection of international waters, and reduction of the impact of chemicals, while generating sustainable livelihoods” For additional information, please visit [www.sgp.undp.org](http://www.sgp.undp.org) or email [gefsgp@bti.net](mailto:gefsgp@bti.net).***



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Fragments of Hope / Lisa Carne: 21 (A. cervicornis), 29 (left), 87  
Hol Chan Marine Reserve: Pages: 81  
Jim Klug / Turneffe Flats: Pages: 58 (centre)  
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Leovehildo Tamai: Pages 15, 24, 25, 31, 37  
Placencia Producers Cooperative Society Ltd.: Pages: 86  
Rachel Graham/MarAlliance: Pages 4, 5, 7, 13, 20, 21(top, Hawksbill turtle), 29 (middle and right), 38, 49, 59  
Sarteneja Alliance for Conservation and Development: Pages: 45  
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Wildtracks: Page 11, 12, 16, 17, 22, 23, 26, 28, 44, 45, 46 (with LightHawk), 47 (with LightHawk), 48 (with LightHawk), 49, 50 (with LightHawk), 69, 71, 73, 76, 81 (right and left), 82, 83, 89  
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**Artwork:** Felicity Munoz

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**Maps:** Adam Lloyd, Laura Rack



OUR SHARED  
HERITAGE  
CAMPAIGN



*Every inch of our jewel is a treasure. Every atoll, every caye, every channel, every shark, whale, dolphin, turtle, lobster, conch, snapper... even grunt!*

*Every sunrise shows us how much we have to lose and how much we have to protect. Don't let the sun set without protecting all our coastline.*

*Nadia Bood, WWF*

## **THE BLUE HOLE**

*Heritage is our legacy –  
what we have received from the past,  
what we live with today,  
and what we pass on to future generations*