Directory of Belize’s protected areas

2011
The Directory of Belize’s
Protected Areas

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# The Directory of Belize’s Protected Areas

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<tr>
<td>BAS</td>
<td>Belize Audubon Society</td>
</tr>
<tr>
<td>BFD</td>
<td>Belize Fisheries Department</td>
</tr>
<tr>
<td>CBD</td>
<td>Convention on Biological Diversity</td>
</tr>
<tr>
<td>CBO</td>
<td>Community-based Organization</td>
</tr>
<tr>
<td>CCAD</td>
<td>Central American Commission on the Environment and Development</td>
</tr>
<tr>
<td>FAMRACC</td>
<td>Forest and Marine Reserve Association of Caye Caulker</td>
</tr>
<tr>
<td>FCD</td>
<td>Friends for Conservation and Development</td>
</tr>
<tr>
<td>FD</td>
<td>Forest Department</td>
</tr>
<tr>
<td>IUCN</td>
<td>International Union for the Conservation of Nature</td>
</tr>
<tr>
<td>LAMP</td>
<td>Long-term Atoll Monitoring Project</td>
</tr>
<tr>
<td>MBRS</td>
<td>Mesoamerican Barrier Reef System</td>
</tr>
<tr>
<td>MPA</td>
<td>Marine Protected Area</td>
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<tr>
<td>MR</td>
<td>Marine Reserve</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>NPAPSP</td>
<td>National Protected Areas Policy and System Plan</td>
</tr>
<tr>
<td>PfB</td>
<td>Programme for Belize</td>
</tr>
<tr>
<td>PROARCA</td>
<td>Central American Environmental Program</td>
</tr>
<tr>
<td>SACD</td>
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<td>SATIIM</td>
<td>Sarstoon Temash Institute for Indigenous Management</td>
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<td>SEA</td>
<td>Southern Environmental Association</td>
</tr>
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<td>TIDE</td>
<td>Toledo Institute for Environment and Development</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<td>WWF</td>
<td>World Wildlife Fund</td>
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We would like to thank the staff and officers of the protected areas (both national and private), the Belize Fisheries Department, the Forest Department and the co-management partners for their participation in the development of this Directory. Thanks also go to Yvette Alonzo and the Board members of the Association of Protected Area Management Organizations, and to Adam Lloyd and Hilary Lohmann (Wildtracks) for their assistance in the preparation of the maps.

Unless otherwise stated, photographs are credited to Wildtracks (Paul and Zoe Walker) - thanks go to all those people who provided photographs for this Directory. Front page credits: Top and Middle: Wildtracks, Bottom: R. Graham / E. Hickerson.

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Belize has long been considered a leader in conservation within the Mesoamerican region, with the designation of 36% of its terrestrial area for conservation or sustainable resource use and 13 protected areas (608,740 acres) of its marine territory, focused on management of the diverse marine life. At its heart, Belize has the Maya Mountains Massif – one of the few remaining large, intact blocks of forest left in Central America. Running parallel to the shore, the Belize barrier reef provides a valuable resource for traditional fishing communities, and Belize’s marine-based tourism industry.

Past anthropogenic pressures have been limited, maintaining Belize’s position as a natural resource-rich conservation success story and eco-tourism destination. However rapid population growth and economic development are now increasing pressures on the National Protected Areas System and biodiversity, whilst socio-economic challenges both within Belize and across the border in Guatemala, are increasingly impacting Belize’s protected areas. With impacts such as unsustainable resource extraction, land use change and reduced water quality, the role of the protected areas system becomes ever more important in the maintenance of environmental goods and services including water security, climate change mitigation, provision of marine resources, and timber and non-timber forest products, and maintenance of quality of life.

Directory of Protected Areas

This Directory of Belize’s Protected Areas is based on the original Directory compiled by Simon Zisman and printed in 1996, and seeks to update the information available on the national protected areas managed under the National Protected Areas System – those legislated under the National Parks System Act, administered by the Forest Department, and those under the Fisheries Act, administered by the Belize Fisheries Department, as well as the eight nationally recognized private reserves.

Compilation of the Directory has only been possible through the input of many conservation stakeholders, with information being provided directly, by protected area managers and management organizations, and indirectly, through data sourced from the recent assessment of management effectiveness (2009). It has been compiled to reflect the establishment history and current status of the protected areas, their importance in the Belize and regional landscape both for environmental services and biodiversity conservation, and their management regimes.

This Directory covers the thirty-two non-extractive protected areas administered by the Forest Department (Ministry of Natural Resources) and eight Marine Reserves managed by the Fisheries Department (Ministry of Agriculture and Fisheries), as well as information on the spawning aggregation sites, bird colonies, protected areas being designated, and private protected areas.
This Directory encompasses eight different management categories, dependent on the legislative framework under which they were designated. It covers the 32 non-extractive protected areas administered by the Forest Department (Ministry of Natural Resources) and 8 Marine Reserves managed by the Fisheries Department (Ministry of Agriculture and Fisheries), as well as providing information on the 11 spawning aggregation sites, 7 bird colonies and 8 private protected areas recognized under the National Protected Areas System.

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<td>2. Non-Extractive Reserves</td>
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<td>Wildlife Sanctuaries (2)</td>
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<td>3. Spawning Aggregation Sites</td>
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<td>Private Protected Areas</td>
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<td>Private Protected Areas (8)</td>
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</tr>
</tbody>
</table>

Keel-billed Toucan (National Bird)

Morelet’s Treefrog (Critically Endangered)
Belize lies within Mesoamerica, recognised as one of the richest biodiversity areas on this planet, ranking second only to the tropical Andes in terms of diversity and endemism. Despite contributing only one percent to the world’s terrestrial land area, Mesoamerica is thought to have seventeen percent of all known terrestrial species. This species richness and diversity can be traced back in part to the geological history of the area, which forms a transition zone between three biogeographically distinct regions – the Nearctic, Neotropical and the Caribbean.

With its large extent of intact tropical forests, rolling mountains, open savannas, and lagoons, and the network of natural ecosystems within the protected areas system, Belize provides a critical landscape function within Mesoamerica, contributing towards the maintenance of regional biodiversity and viable populations of many species considered threatened throughout their range.

Belize’s natural resources – including timber, medicinal plants, house construction materials (leaves, vines and poles) and game species - contributes towards national and local sustainability. The functional ecosystems and intact natural vegetation of the protected areas of the Maya Mountains and associated foothills, from the Peccary Hills in the north to the Columbia River Forest Reserve in the south, encompass a wide range of ecosystems over an altitudinal gradient, and provide connectivity from mountain ridge to coastal areas and on to the Belize Barrier Reef. The Selva Maya, which continues the connectivity to the forests of the north-west, makes this the second largest contiguous area of tropical rainforest in the Americas, after the Amazon. The carbon sequestration functions of the intact forest canopy and the hydrological processes that provide water security to the coastal plains, all add to the importance of these protected areas for maintenance of quality of life for people throughout Belize.

The large lagoons of northern Belize provide foraging grounds for many waterbirds – Crooked Tree Wildlife Sanctuary, recognised internationally as a RAMSAR site, a globally important wetland, supports rich waterbird populations within the shallow, open lagoons and forest-lined creeks. Corozal Bay and Southern Lagoon provide critical ecosystems for the slow-moving West Indian manatee, and mangrove cayes support nesting colonies of hundreds of birds – white ibis, wood stork, reddish egrets, magnificent frigatebirds and roseate spoonbills among them.

The presence of top predators such as jaguars suggests that the trophic structure is still largely intact, with viable populations of prey species. This, however, is changing as the increasing human footprint and higher levels of poverty within Belize are starting to impact the natural resources. There are also pressures on Belize’s natural resources and land from neighbouring Guatemala, with poverty driving border communities to enter Belize in the remote Chiquibul and Columbia River forest regions, to harvest the forest resources to the point of depletion.
This biodiversity richness is also reflected in the Belize reef system, with its crystal clear waters, barrier reef and offshore coral atolls. It is considered the largest, and possibly the least impacted reef in the Atlantic–Caribbean region, with the highest diversity of fish species. It encompasses some of the most important components of the Mesoamerican Reef system, stretching from the littoral forest and mangroves of the coastline, across the shallow coastal lagoon with its scattering of idyllic cayes and near-pristine reefs, to the barrier reef itself 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 the associated seagrass and other marine ecosystems are a complex, integrated series of ecosystems that support viable populations of threatened species, sustain coastal fishing communities, and draw significant tourism to Belize.

Seven marine protected areas form the Belize Barrier Reef World Heritage Site which, together with a further six marine protected areas, form the core of Belize’s conservation strategies for sustainable use of marine resources.

Hawksbill turtles still swim in the clear waters and nest on the coral sand cayes – however, numbers of this critically endangered species are declining, as are those of the commercial fish stocks – grouper, snapper, lobster and conch among them – as increasing human pressure is placed on the marine system. Coastal developments, overfishing, aquaculture and agricultural runoff, and oil exploration are ever increasing threats to the integrity of the marine ecosystems.

Coastal communities preserve a traditional way of life that is closely tied to these marine resources, with fishermen free-diving for lobster and conch from locally built sailboats, or catching snapper and grouper on hand lines for local fish markets. These communities are seeking to maintain their cultural values and heritage, and their link with the marine environment as they are forced by declining marine resources to move into other livelihoods such as tourism.

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### Marine Species of International Concern

#### Critically Endangered
- Staghorn Coral *Acropora cervicornis*
- Elkhorn Coral *Acropora palmata*
- Goliath Grouper *Epinephelus itajara*
- Hawksbill Turtle *Eretmochelys imbricata*

#### Endangered
- Loggerhead Turtle *Caretta caretta*
- Green Turtle *Chelonia midas*
- Nassau Grouper *Epinephelus striatus*
- Fire Coral *Millepora striata*
- Boulder Star Coral *Montastraea annularis*
- Star Coral *Montastraea faveolata*
- Great Hammerhead *Sphyrna mokarran*

#### Vulnerable
- Lamarck’s Sheet Coral *Agarica lamarcki*
- Queen Triggerfish *Balistes vetula*
- Pillar Coral *Dendrogyra cylindrus*
- Marbled Grouper *Dermatolepis inermis*
- Elliptical Star Coral *Dichocoenia stokesii*
- White Grouper *Epinephelus flavolimbatus*
- Snowy Grouper *Hyporthodus niveatus*
- Hogfish *Lachnolaimus maximus*
- Mutton Snapper *Lutjanus analis*
- Cubera Snapper *Lutjanus cyanopterus*
- Montastraea Coral *Montastraea franksi*
- Rough Cactus Coral *Mycetophyllis ferox*
- Yellowmouth Grouper *Myctoperca interstitialis*
- Whale Shark *Rhincodon typus*
- Whitelined Toadfish *Sanopus greenfieldorum*
- Rainbow Parrotfish *Scarus guacamaia*
- West Indian Manatee *Trichechus manatus*

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*Left: Sarteneja Fishing Boat*
The National Protected Areas System provides protection for the rich biodiversity of Belize – of the forests and reef, the lagoons and cayes. It also provides a number of ecosystem services essential for the health and well being of people throughout Belize.

**Water Security**
- The catchment functions of the intact forest canopy of protected areas of the Maya Mountains Massif and the private lands of the northern foothills are important in the role of watershed protection and water security for much of Belize, as well as a significant portion of the Petén, in Guatemala.
- The lagoons of the flat northern and coastal plains provide important flood control functions, acting as sinks for excess water during storm events.

**Carbon Sequestration**
- The extensive, intact forest canopy contributes towards global climate control, through carbon sequestration, assisting in the reduction of greenhouse gas emissions.

**Natural Resource Use**
- Many communities situated adjacent to protected areas (particularly in southern Belize) rely on natural resources for house construction materials, medicinal plants, craft materials and other activities.
- Pacaya and cabbage palm are harvested for food, whilst game species such as great curassow and paca are important in supplementing the basic diet in these rural communities.

**Tourism and Recreation**
- The aesthetic landscapes of the national parks of Belize are an important recreational resource, both as a tourism destination and as part of Belize’s natural and national heritage. Scenic vistas, waterfalls and caves all provide inspiration and educational opportunities to both Belizean and international visitors.
The Marine Protected Areas of Belize encompass some of the best representative examples of the Mesoamerican Reef. The Barrier Reef and sheltered, clear waters, the coral sand cayes, near-pristine atolls and multi-species spawning aggregations are of particularly high ecological value, contributing significantly to the maintenance of marine biodiversity in the region.

**Marine Resources**

- The reef is of economic importance to Belize, supporting the traditional lobster, conch and finfish fisheries and providing incomes for fishermen from coastal communities.
- The no-take zones within the marine protected areas ensure that there are viable populations of commercial species for subsistence and commercial fishing.
- The spawning aggregation sites, mangroves, seagrass and coastal lagoons provide critical habitats as spawning and nursery areas, and are vital in the maintenance of commercial species.

**Coastline Protection**

- The barrier reef and coastal mangroves provide significant protection against the impacts of tropical storms and hurricanes, protecting property and infrastructure, as well as lives.
- Mangrove roots protect shorelines and cayes from erosion during storm events.

**Tourism and Recreation**

- The dazzling arrays of coral and fish are of high touristic value, attracting snorkelers and divers from all over the world, benefitting Belize’s growing number of tourism operations, based from both the cayes and the mainland, and providing over 20% to Belize’s GDP.

**Educational and Outreach Resources**

- Access to pristine marine areas and marine life for educational activities, building awareness of Belize’s natural resources, and encouraging future good stewardship.

**Critical Ecosystem Functions of the Marine ecosystems and Resources of Belize**

**Ecosystem Services**

**Mangroves**

- Nutrient cycling
- Protection of shorelines from storm surges
- Filtering of runoff for reduced sedimentation and water pollution
- Roots provide important nursery areas for commercial and non-commercial species
- Provide nesting structures for important bird colonies

**Coral Reef**

- Barrier reef protects coastline from storm surges
- Provides coral, a major component of beaches and cayes
- Source of spawn recruitment for much of the Caribbean
- Value as a tourism resource

**Seagrass**

- Nutrient cycling
- Stabilizing substrates and settling water turbidity

**Direct Products**

- Lobster, conch and shrimp
- Fin fish
- Seaweed
- Sand

**Inspirational and Cultural Attributes**

- Aesthetic land/seascapes
- Relaxation
- Traditional vacation location

---

**Environmental Services**

- **Weak Management Effectiveness**
  - Weak Surveillance and Enforcement
  - **Result**: Unsustainable extraction
  - Damage to ecosystems
  - Damage to tourism
  - Transboundary incursions

- **Management Effectiveness**
  - Weak Governance and Lack of Due Process
  - **Result**: Unsustainable / poorly planned development
  - Removal of mangroves
  - Transboundary incursions

- **Impacts on Environmental Services**
  - Reduced availability of natural resources
  - Reduced coral viability and recruitment
  - Reduced habitat availability for marine species
  - Reduced nursery habitat
  - Reduced protection of property
  - Reduced value for tourism
**STATE OF THE BIODIVERSITY**

Belize's terrestrial protected areas encompass a wide range of representative ecosystems, and protect a high diversity of species, ranging from the critically endangered Morelet’s treefrog to the wide-ranging and charismatic jaguar. A series of seventeen biodiversity indicators have been selected and assessed to provide an overview of the status of the terrestrial biodiversity in Belize's protected areas system. Overall, the viability of the terrestrial protected areas system of Belize is considered to rate at the lower end of GOOD, with an effectiveness of 57.0%.

If taken in the context of the status ten to fifteen years ago, prior to the current Guatemalan incursions and expansion of the human footprint, this represents a significant decline across the system, with the rating slipping from VERY GOOD.

- **Species of International Concern average a viability score of 58.3% (at the lower end of GOOD), suggesting the protected areas are reasonably effective for the conservation of these threatened indicator species.**
  
- **The averaged level of risk to these species is considered HIGH, with two species, the hicatee and the yellow-headed parrot, assessed as Very High.**
  
- **Species of National Concern rate as GOOD, averaging a viability score of 55.8%**
  
- **However, three indicator species are considered as at VERY HIGH risk – the scarlet macaw, white-lipped peccary and ocellated turkey, and in danger of local extirpation in some protected areas - the latter two are heavily hunted in areas in which they occur.**

**SPECIES OF INTERNATIONAL CONCERN**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Status</th>
<th>Risk Level</th>
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</thead>
<tbody>
<tr>
<td>Central American River Turtle</td>
<td>Critically Endangered</td>
<td>Very High</td>
</tr>
<tr>
<td>Dermatemys mawii</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow-headed Parrot</td>
<td>Endangered</td>
<td>Very High</td>
</tr>
<tr>
<td>Amazona oratrix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Curassow</td>
<td>Vulnerable</td>
<td>High</td>
</tr>
<tr>
<td>Crax rubra</td>
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<td></td>
</tr>
</tbody>
</table>

**SPECIES OF NATIONAL CONCERN**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Status</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>White lipped Peccary</td>
<td>Fair</td>
<td>Very High</td>
</tr>
<tr>
<td>Tayassu pecari</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scarlet Macaw</td>
<td>Fair</td>
<td>Very High</td>
</tr>
<tr>
<td>Ara macao</td>
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</tbody>
</table>

**CROWN BIRD COLONIES**

Seven Crown Bird Colonies were established in 1977 under the Lands Act for the protection of key bird nesting and roosting sites. These cayes are considered critical in the maintenance of colony nesting species such as magnificent frigatebirds, brown pelicans, wood storks, roseate spoonbills, white ibis and more.

<table>
<thead>
<tr>
<th>Bird Colony Name</th>
<th>Management Presence</th>
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<tbody>
<tr>
<td>Monkey Caye</td>
<td>No</td>
</tr>
<tr>
<td>Little Guana Caye</td>
<td>Intermittent</td>
</tr>
<tr>
<td>Los Salones</td>
<td>Intermittent</td>
</tr>
<tr>
<td>Bird Caye</td>
<td>No</td>
</tr>
<tr>
<td>Un-Named</td>
<td>No</td>
</tr>
<tr>
<td>Man of War Caye</td>
<td>Yes</td>
</tr>
<tr>
<td>Dubloon Bank</td>
<td>No</td>
</tr>
</tbody>
</table>

Only one of these cayes (Man O’ War Caye) is fully integrated into the National Protected Areas System, being located within South Water Caye Marine Reserve, an active protected area, and few have any significant management presence.

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1 Based on 29 protected areas considered to have sufficient valid data on biodiversity
Belize is known worldwide for its pristine dive sites, extensive mangroves and seagrass, and high fish diversity. Over the last ten years, however, these values are being increasingly impacted by anthropogenic/human activities. Twenty one indicators have been selected to provide an overview of the current status of the biodiversity across the marine protected areas. These include ecosystems and species of concern, commercial species, and species flagged for their touristic importance.

Overall, the marine protected areas of Belize average a rating of **GOOD** under this assessment, with a viability score of 63.0%, though this is considered to be over-positive when compared with parallel assessments, and was downgraded to **FAIR** during the validation exercise.

- Species of International Concern average a score of 55.5% (**GOOD**), with an average risk level of **Medium**.
- The critically endangered goliath grouper and hawksbill turtle are considered at **Very High** risk, along with the Nassau grouper, queen triggerfish, hogfish, loggerhead and green turtles.
- Species of National Concern average a score of 64.2% (**GOOD**), with an overall risk level of **Medium**.
- Lobster and conch, the two primary commercial species on which Belize’s fishing industry is based, are both identified as at **High** risk across the system.

### SPAWNING AGGREGATION SITES

Spawning aggregations - sites where thousands of grouper, snapper and other fish gather to reproduce - are critical to the maintenance of Belize’s commercial fish stocks. The congregations at these sites have crashed throughout Belize since first being targeted by fishermen. Whilst seasonal protection is in place for the majority of these sites, and most are maintaining low numbers, few are showing true signs of recovery, and some have completely collapsed.

Since 2003, monitoring of selected key spawning aggregation sites has been ongoing, showing that Nassau Grouper aggregations continued to decline until 2008, before starting to show signs of recovery.

Eleven of these sites have been protected since 2003, and a further two Nassau grouper sites have seasonal protection, with a provision for continued fishing by traditional fishermen under special license for many of these sites.

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<th>Protected Spawning Sites</th>
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<td>Dog Flea Caye</td>
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<td>Sandbore</td>
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<td>South Point Lighthouse</td>
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<td>Emily / Caye Glory</td>
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<td>Northern Glover’s</td>
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<td>Gladden Spit</td>
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<tr>
<td>Rise and Fall Bank</td>
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<tr>
<td>Nicholas Caye</td>
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<tr>
<td>Seal Caye</td>
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### SPECIES OF INTERNATIONAL CONCERN

<table>
<thead>
<tr>
<th>Species of International Concern</th>
<th>Status in Belize</th>
<th>Risk Level</th>
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<tbody>
<tr>
<td>Goliath Grouper Epinephelus itajara</td>
<td>Fair</td>
<td>Very High</td>
</tr>
<tr>
<td>Hawksbill Turtle Eretmochelys imbricata</td>
<td>Fair</td>
<td>Very High</td>
</tr>
<tr>
<td>Hogfish Lachnolaimus maximus</td>
<td>Good</td>
<td>High</td>
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### ECOSYSTEMS

<table>
<thead>
<tr>
<th>Ecosystem</th>
<th>Status in Belize</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coral Reef</td>
<td>Fair</td>
<td>Very High</td>
</tr>
<tr>
<td>Mangroves</td>
<td>Very Good</td>
<td>Medium</td>
</tr>
<tr>
<td>Seagrass</td>
<td>Very Good</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Above:** Spawning congregation at Gladden Spit (SEA)

**Risk level**

<table>
<thead>
<tr>
<th>Risk level</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>Significant risk of extirpation</td>
<td>≤ 1.00</td>
</tr>
<tr>
<td>High</td>
<td>Severely decreasing population</td>
<td>&gt;1.00 – 2.00</td>
</tr>
<tr>
<td>Medium</td>
<td>Gradually decreasing population</td>
<td>&gt;2.00 – 3.00</td>
</tr>
<tr>
<td>Low</td>
<td>Relatively stable population</td>
<td>&gt;3.00</td>
</tr>
</tbody>
</table>

The risk level is calculated from the combined viability and trend scores per species.

STATE OF THE Biodiversity
Impacts – Pressures and Threats on the National Protected Areas System

There are increasing human impacts on both the terrestrial and marine components of the National Protected Areas System, with unsustainable resource extraction, weak implementation of Government legislation and policies, coastal development and transboundary incursions being highlighted as significant issues across the 35 protected areas for which data is available.

Impacts across the Terrestrial Protected Areas System

- The greatest impacts on the terrestrial protected areas system in terms of geographical scope are hunting, logging and transboundary impacts, all of which affect more than 40% of the 35 protected areas for which there is data.

- The three protected areas with the highest combined pressure /threat scores are those that lie along the Guatemala / Belize border – Sarstoon Temash National Park, Columbia River Forest Reserve, and Chiquibul National Park.

- Illegal natural resource extraction – particularly hunting, xate harvesting and fishing, and poaching of parrots and macaws - is having profound impacts on biodiversity, as are the increasing number of agricultural incursions. Protected area management at both site and system level is not considered to be adequately protecting many species, including the Critically Endangered Central American river turtle (hicatee), the scarlet macaw, white-lipped peccary, ocellated turkey, and yellow-headed parrot.

- National extirpation of some of these species is a distinct possibility in the near future if the impacts of illegal activities within protected areas are not addressed more effectively.

Pressures are considered as past direct and indirect negative impacts on the biodiversity, whilst threats are the future potential negative impacts.
Impacts across Marine Protected Areas (MPAs)

The primary four pressures and threats were identified and assessed for each marine protected area. This resulted in the identification of eleven key impacts across the marine protected areas of Belize, each affecting at least one, or as many as twelve of the thirteen marine protected areas:

- Climate change, as a global threat, is considered to be a high impact on reef ecosystems, and superimposed on all other threats.

- Of the eleven system-level impacts, three are identified as key impacts that affect over 50% of marine protected areas across Belize:
  - Overfishing / illegal fishing
  - Coastal / caye development
  - Tourism impacts

- Pollution and illegal transboundary fishing are assessed as key impacts on between three and six of the marine protected areas.

- This was followed by boat groundings and the associated contamination of water by oil spills.

Future threats have been assessed in the same way. In the majority of cases, the pressures currently impacting the marine protected areas are assessed as being likely to remain the same, or increase, over the next 5-year period:

- The highest potential threat has been identified as boat groundings and the associated contamination of water by oil spills. Whilst such occurrences are only occasional, they have the potential to seriously impact large areas of reef. The increased movement of petroleum products by ship through Belize waters increases this threat.

- Oil exploration and extraction in the marine environment is also identified as a potential threat that could have a devastating impact on the marine resources.

- Mangrove clearance is identified as the second highest future threat, reflecting the increasing development of coastal and caye properties for tourism and retirement. Mangroves are critical for many reef species, including those targeted commercially, particularly for protection during the juvenile life stages. Mangrove removal throughout the marine sector may therefore have significant implications on future viability of commercial fish stocks.

Above: Coastal and caye development is an increasing impact on the marine environment

Above: Aqua-cultural run off from coastal shrimp farms and unsustainable fishing pressures on commercial species - especially lobster and conch - are among the impacts affecting the long term viability of Belize’s marine resources
Three different Government Ministries have mandates for the creation and management of national protected areas within Belize – the Forest Department, the Fisheries Department and the National Institute of Culture and Heritage / Institute of Archaeology (Figure 1). Belize also has a number of private lands under protection, which are not yet fully legally embedded within the national framework.

![Diagram showing Government Agencies with Legal Jurisdiction over Protected Areas](image)

This Directory primarily covers those protected areas designated under the National Parks Systems Act, administered by Forest Department, and those legislated under the Fisheries Act, and administered by the Fisheries Department. It also includes the eight private protected areas.

**Terrestrial Protected Areas in Belize**

The majority of the terrestrial protected areas are non-extractive, and were established under the National Parks Systems Act (1982), under the mandate of the Forest Department. These include National Parks, Natural Monuments, Nature Reserves and Wildlife Sanctuaries. The Forest Department also administers the Forest Reserves (established under the Forest Act 1927, revised 2000), the only category established for extractive use, with several being managed for timber extraction under long term (40 year) license agreements.

The seven Crown Bird Colonies were gazetted in 1977, under the Crown Lands Ordinance (1926), to protect critical nesting and roosting colonies. There is no formal administration of these cayes within the National Protected Areas System, unless they occur within other protected areas (eg. Man-O-War Caye, which lies within South Water Caye Marine Reserve, and is managed as part of the protected area, by Belize Fisheries Department staff), or close enough to be incorporated into routine patrols in adjacent...
protected areas (for example, Los Salones and Little Guana Caye are both included within SACD patrols of Corozal Bay Wildlife Sanctuary).

**Marine Protected Areas in Belize**

Marine protected areas are one of the most important conservation tools available to Belize to ensure the conservation of the marine environment, and, like the terrestrial protected areas, contribute towards global goals and standards laid out under the Convention on Biological Diversity.

This Directory covers Belize’s 13 marine protected areas, administered by two Government authorities - the Fisheries Department (Department of the Ministry of Agriculture and Fisheries) and the Forest Department (Ministry of Natural Resources) - in partnership with a number of co-management agencies (large NGOs - the Southern Environmental Association, Toledo Institute for Development and Environment, and Belize Audubon Society – and smaller community-based organizations – Sarteneja Alliance for Conservation and Development and Friends of Swallow Caye).

The Fisheries Department has the mandate to sustainably manage and develop Belize’s fishing sector, under the Fisheries Ordinance (1948, revised in 2000), and complimented by the Fisheries Regulations of 2004. Under this, the Protected Area Management programme falls under the Ecosystems Management Unit, through which the Fisheries Department establishes and manages the eight Marine Reserves.

The Marine Reserves are established under the Fisheries Act (1980, amended 1983), to...

*...afford special protection to the aquatic flora and fauna of such areas and to protect and preserve the natural breeding grounds and habitats of aquatic life,*

*...allow for the natural regeneration of aquatic life in areas where such life has been depleted*

Five of the Marine Reserves are managed directly by the Fisheries Department, whilst the remaining three are managed with co-management partners. Marine Reserves established under the Fisheries Department have clear, legislated zones allowing for extractive and non extractive use, and conservation protection, with use concentrating on sustainable fishing, tourism, research and education. The Department has also established 11 protected Spawning Aggregation Sites (SI 161 of 2003), covering the majority of the sites known within Belize waters. A further 2 have seasonal protection for Nassau grouper (SI 162 of 2003). There is provision for continued fishing by traditional fishermen under special license for several of these sites.

The eight recognized Private Reserves are lands held under private ownership either by conservation organizations, or by private individuals, that are informally acknowledged by Forest Department as within the National Protected Areas System.
<table>
<thead>
<tr>
<th>National Park</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aguas Turbias</td>
<td>8,750</td>
</tr>
<tr>
<td>Bacalar Chico</td>
<td>11,145</td>
</tr>
<tr>
<td>Billy Barquedier</td>
<td>1,639</td>
</tr>
<tr>
<td>Chiquibul</td>
<td>264,003</td>
</tr>
<tr>
<td>Five Blues Lake</td>
<td>4,061</td>
</tr>
<tr>
<td>Gra Gra Lagoon</td>
<td>1,320</td>
</tr>
<tr>
<td>Guanacaste</td>
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</tr>
<tr>
<td>Honey Camp</td>
<td>7,772</td>
</tr>
<tr>
<td>Laughing Bird Caye</td>
<td>10,120</td>
</tr>
<tr>
<td>Mayflower Bocawina</td>
<td>7,854</td>
</tr>
<tr>
<td>Monkey Bay</td>
<td>2,122</td>
</tr>
<tr>
<td>Noj Ka’ax H’Men Elijio Panti</td>
<td>12,657</td>
</tr>
<tr>
<td>Payne’s Creek</td>
<td>36,421</td>
</tr>
<tr>
<td>Peccary Hills</td>
<td>10,744</td>
</tr>
<tr>
<td>Rio Blanco</td>
<td>94</td>
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<tr>
<td>Sarstoon-Temash</td>
<td>41,855</td>
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<td>St. Herman’s Blue Hole</td>
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<table>
<thead>
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<tr>
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<tr>
<td>Half Moon Caye</td>
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<td>Thousand Foot Falls</td>
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<table>
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<td>Burdon Canal</td>
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<td>Tapir Mountain</td>
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<td>Corozal Bay</td>
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<td>Crooked Tree</td>
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<td>Gales Point</td>
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<td>Spanish Creek</td>
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## Marine Reserves

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<tr>
<td>Caye Caulker Marine Reserve</td>
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<tr>
<td>Gladden Spit and Silk Cayes Marine Reserve</td>
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<td>Glover’s Reef Marine Reserve</td>
<td>86,653</td>
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<tr>
<td>Hol Chan Marine Reserve</td>
<td>3,813</td>
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<tr>
<td>Port Honduras Marine Reserve</td>
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## Spawning Aggregation Sites

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<tr>
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<td>1,402</td>
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<tr>
<td>Dog Flea Caye</td>
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<tr>
<td>Caye Bokel</td>
<td>1,402</td>
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<tr>
<td>Sandbore</td>
<td>1,288</td>
</tr>
<tr>
<td>South Point Lighthouse</td>
<td>1,378</td>
</tr>
<tr>
<td>Emily / Caye Glory</td>
<td>1,351</td>
</tr>
<tr>
<td>Northern Glover’s</td>
<td>1,779</td>
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<tr>
<td>Gladden Spit</td>
<td>1,280</td>
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<tr>
<td>Rise and Fall Bank</td>
<td>4,250</td>
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<tr>
<td>Nicholas Caye</td>
<td>1,664</td>
</tr>
<tr>
<td>Seal Caye</td>
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National Parks

Peccary Hills National Park
Photo: Zoe Walker / Wildtracks
National Parks

For the protection and preservation of natural and scenic values of national significance for the benefit and enjoyment of the general public

<table>
<thead>
<tr>
<th>Name</th>
<th>IUCN Category</th>
<th>Gazetted</th>
<th>Management / Co-Management Partner</th>
<th>Acres</th>
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<td>Aguas Turbias</td>
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<td>1994/44</td>
<td>Forest Department</td>
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<tr>
<td>Bacalar Chico</td>
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<td>1996/89</td>
<td>Green Reef</td>
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<td>Billy Barquedier</td>
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<td>Chiquibul</td>
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<td>Guanacaste</td>
<td>II</td>
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<td>Honey Camp</td>
<td>II</td>
<td>2001/65</td>
<td>Forest Department</td>
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<td>Laughing Bird Caye</td>
<td>II</td>
<td>1996/94</td>
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<td>Mayflower Bocawina</td>
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<td>Guardians of the Jewel</td>
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<td>Noj Kaax H’Men Elijio Panti</td>
<td>II</td>
<td>2001/177</td>
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<td>Payne’s Creek</td>
<td>II</td>
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<td>Peccary Hills</td>
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<tr>
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<td>1994/41</td>
<td>Friends of Rio Blanco</td>
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<tr>
<td>Sarstoon-Temash</td>
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<td>1994/42</td>
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<tr>
<td>St. Herman’s Blue Hole</td>
<td>II</td>
<td>1986/109</td>
<td>Belize Audubon Society</td>
<td>665</td>
</tr>
</tbody>
</table>

*Prospective co-management organisation. No formal co-management agreements are currently being made, but these organizations have informal co-management authority.
Aguas Turbias National Park

Aguas Turbias National Park, situated in western Orange Walk District, lies adjacent to the Rio Bravo Conservation Management Area, and runs northwards along the Guatemala border, forming an important component of tri-national protected area connectivity with the Calakmul-Rio Bravo forest.

Physical Features

Lying on the Yucatan platform, the topography of the National Park is relatively flat with slightly undulating terrain towards the south. The area has karstic characteristics. The limestone bedrock is very close to the surface, and even exposed in places, resulting in a water-deficient regime in dry season, whilst the limited topography results in poor drainage, with inundation of much of the forest during wet season, particularly in the northern portion of the protected area.

Biodiversity

With the drought conditions in dry season and inundation in wet season, the vegetation of the National Park is highly adapted to these harsh conditions. The bajo forests in the north of the protected area, inundated for the wettest parts of the year, are rich in epiphytes, with orchids and bromeliads well adapted to the changing conditions.

Four ecosystems have been identified and mapped within the protected area (Meerman, 2004), though indications of past logging activities and agricultural incursions suggest that these cannot be considered in pristine condition (especially as these incursions include a 250 acre area of secondary growth in the centre of the National Park - the remnants of previously cleared pasture).

Biodiversity is considered to be like that of the adjacent Rio Bravo Conservation Management Area, though with the lack of management presence, natural resources are under severe pressure, particularly from illegal hunting, logging, and bayleaf harvesting, particularly from Guatemala.

Landscape Context

Aguas Turbias National Park was originally established as a “peace park”, along the borders with Guatemala and Mexico. Due to its location, contiguous with the Rio Bravo Conservation Management Area and the Maya Biosphere Reserve, it provides trans-boundary connectivity between Belize, Guatemala and Mexico in the Selva Maya Priority Area of the Mesoamerican Biological Corridor. Within Belize, the National Park lies adjacent to the Blue Creek Mennonite community, to the north, with its extensive cattle farming on improved pasture. To the east lies a large tract of privately owned, undeveloped forest. To the west, on the Mexican and
Guatemalan sides, large areas of secondary growth are interspersed with small scale slash and burn cultivation, the human footprint rapidly expanding into the area, and extending to the Aguas Turbias border.

**History of Establishment**

Aguas Turbias was designated as a National Park in 1994, under Statutory Instrument 44, in part in response to geopolitical considerations (border tensions, international timber rustling, etc.) (Zisman, 1996), and to form part of the transboundary peace park with Guatemala and Mexico.

**Management Regime**

The National Park is under the administration of the Forest Department, with the primary objective of maintaining transboundary connectivity within the Maya Forest of Calakmul-Rio Bravo conservation areas. There is no current co-management partner, nor on-site presence, though the area has been included in past conservation planning under Programme for Belize.

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**Association of Protected Area Management Organizations (APAMO)**

Established as an NGO in 2007, APAMO is an association of non-governmental protected areas management organizations that advocates for and contributes to the sustainability and proper management of Belize’s protected areas, to ensure benefits for all stakeholders.

As Belize’s foremost association of committed protected areas management organizations, APAMO contributes to and advocates for the maintenance in perpetuity of a well managed and functional national protected areas system that plays an integral role in national development, and contributes directly to the well being of communities and the nation.

It provides an opportunity for networking and pooling of resources towards the prioritizing of protected area management issues and the improvement of organizational planning to strengthen and improve protected area management in Belize.
Bacalar Chico National Park

Bacalar Chico National Park is situated at the northernmost tip of Ambergris Caye and covers approximately 11,145 acres (4,510.5 ha) within the combined Bacalar Chico Marine Reserve / Bacalar Chico National Park area, one of seven protected areas that together form Belize’s World Heritage Site. The National Park boundaries run from the Belize/Mexico border southward and encompass most of the northern tip of Ambergris Caye, including significant stretches of coastline on the western shores of the caye, and Rocky Point. It encompasses several terrestrial habitats, including well developed littoral forest, coastal wetlands and lagoons, important for many Yucatan endemics and Neotropical migratory birds.

Physical Features

The National Park is situated at the northern end of Ambergris Caye, and lies on the limestone bedrock of the Yucatan Platform, a relict reef formed during times of higher sea levels. This is exposed at Rocky Point, where the current reef meets the mainland. The characteristic rocky outcrops, sinkholes and cenotes of limestone karst scenery are present throughout the National Park, providing shelter for many fish species, including the grouper, in the many lagoons and creeks.

Biodiversity

Some of the best littoral forest in Belize is found within the National Park – certainly the largest contiguous expanse remaining in the country - and provides ecosystem services for a number of Yucatan endemics, such as the Kuka Palm (*Pseudophoenix sargenti*), Yucatan Jay (*Cyanocorax yucatanicus*) and the Orange Oriole (*Icterus auratus*).
Thirty-one mammal species have been recorded within the protected area, including the West Indian manatee (*Trichechus manatus*), classified as Vulnerable in the IUCN Red List. Thirty-six species of reptile have been identified, including three species of sea turtle: the critically endangered hawksbill turtle (*Eretmochelys imbricata*), and the endangered loggerhead (*Caretta caretta*) and green turtles (*Chelonia mydas*). The east facing beaches, with their undisturbed herbaceous beach communities, are important nesting sites for loggerhead, and to a lesser extent, green turtles, with occasional hawksbill turtle nesting. To the north, the National Park includes a portion of the red-mangrove lined Bacalar Chico channel, representing the border between Belize and Mexico, and linking the reef with Corozal/Chetumal Bay.

**Landscape Context**

This trans-boundary area, bordered to the north by Mexico, is noted for its rich biodiversity and its geological and archaeological importance, and has been designated as part of Belize’s World Heritage Site, a system of seven protected areas considered to represent the globally recognised qualities of Belize’s reef system.

The reserve has been impacted by past hurricanes, most recently by Hurricane Keith in 2000 and Hurricane Dean in 2007. The latter caused significant beach erosion, with the loss of a number of turtle nests. Current threats include increasing development of the east-facing coastline, and the potential for the development of a road linking northern Ambergris Caye with Mexico.

The primary stakeholder community is San Pedro, located at the south end of Ambergris Caye. This large tourism centre is primarily reef-focused, but also considers Laguna de Cantena important for sport fishing. Sarteneja, a traditional fishing village to the west, on the mainland, has fishermen that utilize the area, with a number of beach traps established before the designation of the protected area. Sarteneja tour guides are also starting to access the area for tourism, though this is more reef-focused.

**Management Regime**

Management responsibility for Bacalar Chico National Park lies with the Forest Department, with the Marine Reserve being managed by the Fisheries Department, though only Fisheries Officers are present on site. In 1995 a Bacalar Chico Advisory Committee (BCAC) was established to address matters pertaining to the Bacalar Chico National Park / Marine Reserve, but is in need of revitalization.

**SITE INFORMATION**

- **Size:** 11,145 acres (4,510 ha)
- **Statutory Instrument:** SI 89 of 1996
- **IUCN Category:** V
- **Management Authority:** Forest Department
- **Contact E-mail:** fdssecretary@mnrei.gov.bz
- **Location:** Bacalar Chico National Park lies at the northern tip of Ambergris Caye, in the north of Belize
- **Uses:** Non-extractive – tourism, education and research.
- **Biodiversity Information:** Past assessments by Green Reef.
- **Management Plan:** Draft, 2004
- **Facilities (2009):** No data
- **Tourism Visitation (2009):** No data
- **On-site Staff (2009):** No staff
Billy Barquedier National Park

Billy Barquedier National Park is located in Stann Creek District, in hilly terrain just to the north of the Hummingbird Highway and the community of Steadfast. The protection of the water catchment, particularly in the south of the protected area, safeguards the water quality for the Steadfast and Alta Vista communities, whilst also protecting a scenic and biodiversity-rich area with the potential to provide opportunities for diversification into tourism. To the north, the catchment area feeds into the Mullins River.

Access is through Steadfast village, with a series of trails leading through the protected area. Visitors are attracted by the waterfalls and plunge pools of the area, as well as the abundant birdlife.

Physical Features

Billy Barquedier lies adjacent to the Manatee Forest Reserve, in the foothills of the Maya Mountains Massif. Situated on the hard Santa Rosa metasedimentary rocks, it lies within two watersheds - the Stann Creek watershed to the south, and the Mullins River watershed to the north. The National Park extends from the Stann Creek Valley, and Billy Barquedier Waterfalls for approximately 4 miles northwards, over the mountains to the Mullins River Basin where it is bounded by the Mullins River and the Manatee Forest Reserve.

Biodiversity

The park contains approximately 1,630 acres of Tropical evergreen seasonal broad-leaved lowland hill forest: Simaruba - Terminalia variant. Whilst logged in the past, before designation as a National Park, and more recently heavily impacted by landslides as a result of heavy rains associated with Tropical Storm Arthur, in 2008, the forest still provides a viable habitat for a nesting population of the vulnerable keel billed mot mot, and signs of great curassow, jaguar, Baird’s tapir, and black howler monkeys are often encountered.

Landscape Context

The Barquedier watershed has historically provided potable water for the villages of Steadfast, Alta Vista, and in the past, Valley Community, with watershed protection and the conservation of the potable water supply being one of the key reasons for designation.
The National Park lies to the north of the Hummingbird Highway, the closest settlement being the agricultural community of Steadfast, located immediately to the south of the protected area, and the primary access point. The principal economic base of the immediate landscape is agriculture – the Stann Creek valley is the centre of Belize’s citrus industry, providing a major source of employment for residents, and drawing in large numbers of seasonal migrant workers.

**History of Establishment**

The National Park was established in December 29, 2001 (SI 176 of 2001), after seven years of lobbying by adjacent communities for protection of the Barquedier watershed and its associated biodiversity, as well as for the potential for generating tourism revenue for the local economy.

**Management Regime**

Billy Barquedier National Park is administered by the Forest Department, and has been co-managed by the Steadfast Tourism and Conservation Association (STACA), the management partner, since 2003.

The National Park designation supports the protection of the watersheds, and allows for low-impact non-extractive activities such as education, tourism and research activities.

**The Yucatan Banded Gecko**

The Yucatan banded gecko (*Coleonyx elegans*) has a countywide distribution, including Billy Barquedier National Park. This spectacular nocturnal gecko is largely terrestrial, and forages on the forest floor for spider, beetles, crickets and other invertebrates. A charismatic species, with an upright posture, the banded gecko is wrongly thought to be venomous - it is of course harmless.
Chiquibul National Park

Chiquibul National Park, located within the larger Chiquibul Forest region in the southern portion of Cayo District, lies at the heart of the Maya Mountains Massif, and has historically provided a haven for Belize's wildlife. The forest-cloaked karstic landscape to the west and rugged granitic hill slopes along the Maya Divide to the east, as well as the inaccessibility, have left much of this forest untouched. However, increasing human pressures along the porous Belize-Guatemalan western border continue to threaten the natural and cultural resources. Though the park is the largest protected area in Belize, it has only had a management presence since 2007. The primary objective of management has been to address the multiple threats and reclaim the integrity of the park. Many stakeholders are vigorously engaged with FCD in the recovery of the park ranging from governmental agencies, non-governmental bodies, communities and the private sector.

Physical Features

The Maya Mountains, the prominent elevated area to the south west of Belize, were formed by uplifting of the metasediments of the Santa Rosa Group - some of the oldest rocks in Central America, deposited in the Carboniferous and Permian Periods some 225 to 350 million years ago. These are visible in the foothills and upper slopes of the Main Divide in the east of Chiquibul, but are overlain by remnants of the Cretaceous limestones that once blanketed the entire area, in the west. Here, the rugged limestone topography of steep, conical hills is pocked by vertical-sided sinkholes, arches, underground streams and caves. This includes the impressive Chiquibul Cave System, the longest and largest known network of caves in the Western Hemisphere.

A small area of volcanic intrusions also forms part of the geological landscape of the Main Divide, to the extreme south, on the boundary with Bladen Nature Reserve and Cockscomb Basin Wildlife Sanctuary.

Biodiversity

The Chiquibul area has historically been rich in biodiversity, the combination of sedimentary rock and limestone substrata resulting in a mosaic of seventeen forest ecosystems under six broad ecosystem categories.
The National Park provides protection for at least twenty species of international concern (Critically Endangered, Endangered and Vulnerable (IUCN, 2010)), including the Critically Endangered Morelet’s treefrog (*Agalychnis moreletii*). The area has been a critical stronghold for the small, remnant sub-species population of scarlet macaws, the largest parrot species in Belize, though there continues to be pressure from Guatemala for nestlings for the pet trade.

The Cuxtabani area to the north-east has been identified as an important component of the Core Conservation Area of the Maya Mountains Massif, for its value as a refuge for wildlife (Walker and Walker, 2008). Historically Chiquibul was renowned as having some of the least impacted wildlife populations in Belize, with abundant game species and a largely intact trophic structure. This, however, is changing as pressures for natural resources and land, primarily from Guatemala, drives inhabitants from border communities to enter Belize, through much of the remote Chiquibul and Columbia River forest regions, and harvest these resources illegally, to the point of depletion.

**Landscape Context**

The Chiquibul National Park is considered a critical conservation area within the Maya Mountains Massif, surrounding the Chiquibul Forest Reserve, and with Columbia River Forest Reserve to the south, Bladen Nature Reserve, Cockscomb Basin Wildlife Sanctuary, Sittee River Forest Reserve and Sibun Forest Reserve to the south-east and east, and Mountain Pine Ridge and Vaca Forest Reserves to the north. 32.4km of border is shared with the Montañas Mayas/Chiquibul Biosphere Reserve of Guatemala to the west. This expanse of primarily forested uplands and steep-sided valleys is essential for the survival of species such as scarlet macaw, white-lipped peccary, Baird’s tapir and ornate hawk-eagle, which need large contiguous forest stretches in order to maintain viable populations.

The entire Chiquibul Forest forms part of the Belize River Watershed. But within that are 2 main sub-drainage systems formed by the Macal and the Mopan with the Chiquibul River as the main tributary. It is estimated that over 99,500 inhabitants from Guatemala and over 130,000 Belizeans depend on the water resources derived from this system, making the Chiquibul forest a critically important area for its conservation.

Regionally, the National Park is within one of eleven priority areas highlighted under the Sistema Centroamericano de Areas Protegidas (Central American System of Protected Areas) (SICAP), an initiative...
that has been developed in an effort to plan protected area coverage throughout the region and identify gaps in ecosystem coverage. This initiative has emphasized the importance of the addition of the Maya Mountains to the System while recognizing it as a Transboundary Protected Area for Peace and Conservation (WCPA, 2001).

Whilst there are no Belizean communities within the protected area, or adjacent (the closest being the small forestry community of Douglas D'Silva, 12.8km to the north, with a population estimated at 45 people), stakeholder communities on the Guatemalan side of the shared border are reliant on the illegal harvesting of one of the more lucrative of the Chiquibul resources – xaté. These communities have the highest impact on the biodiversity of the area.

**History of Establishment**

Chiquibul National Park was first explored for its timber resources in the early 1900’s, and was originally part of the 456,897 acre (184,900 ha) Chiquibul Forest Reserve, designated under SI 55 in 1956 for the sustainable extraction of timber stocks and watershed protection. In 1991, a large portion was re-designated as the Chiquibul National Park, encompassing the steeper terrain, considered less suitable for timber extraction and more suited to biodiversity conservation and watershed protection. The boundaries of the two reserves were subsequently re-evaluated and re-aligned in 1995 to more accurately reflect the requirements of both timber concessions and biodiversity conservation.

**Management Regime**

The Chiquibul National Park was declared under the National Parks System Act, for the protection and preservation of natural and scenic values of national significance for the benefit and enjoyment of the general public.

The management goal for the Chiquibul National Park is to function as a core area of protection of biological diversity within the Chiquibul Forest and is recognized within the Greater Chiquibul/Maya Mountains Region for its intrinsic natural and cultural values, whilst contributing to national development, regional security and cooperation, and enhancing and maintaining its ecological integrity (Salas and Meerman, 2008).

The National Park is managed as part of the Chiquibul landscape, under a co-management agreement with the non-governmental co-management partner, Friends for Conservation and Development, which has also signed a co-management agreement with the Institute of Archaeology for management of the Chiquibul Cave System.
Five Blues Lake National Park

Five Blues Lake National Park is situated in a dramatic karstic landscape of towering limestone cliffs, sinkholes and caves, with the scenic Five Blues Lake as its main focus. The area, whilst under-utilized, has great potential as a tourism destination, with meandering trails that pass through the tall, impressive tropical broadleaf forests, past the mouths of caves, and to the Five Blues Lake itself, with its heavily vegetated karst islands rich in orchids and other epiphytes. It is, however, under-utilized.

Physical Features

The National Park is situated in part of the Sibun-Manatee karst region, the most north-easterly of the eight karst regions that have been identified in Belize (Miller, 1996), with towering cliffs of exposed limestone rock, caves and sinkholes, and poorly drained valleys. This is the remnant of the limestone deposited on the coastal plain 65 to 125 million years ago, indicative of the area being once covered by a warm, shallow sea. The karstic landscape processes have also resulted in cave systems that are scattered throughout the hills, some still with the presence of undisturbed ancient Maya artefacts.

The main focus of the National Park is a large lake - a cenote formed from a collapsed cave system - that covers an area of approximately 7.4 acres (3.0 ha) (Zisman, 1996) with depths reputed to reach over 65 metres (Boles, 2006). The name ‘Five Blues Lake’ originates from the different shades of blue resulting from the varying water depths. The lake is fed by an underground network of streams that flow out into Indian Creek, and eventually to the Sibun River.

Permanent water bodies seldom form within porous limestone landscapes, and it is thought that the Five Blues Lake is the result of a blockage in the underwater cave system, maintaining the lake. A change in water level occurred in July 2006, thought to be caused by movement in the blockage, with the lake dropping by 5m, though the level returned to normal by the following year (Meerman, 2006).

Biodiversity

Despite its limited size, the Five Blues Lake National Park encompasses a number of ecosystems, set amongst rugged karstic limestone hills. At its central point the large freshwater lake and associated wetlands, with its rooted underwater communities and marshes along the inundated shoreline, provide habitat for freshwater species, including a variety of cichlids. The lake lies within a landscape that reflects the rapid drainage and seasonally dry soils of limestone bedrock, with a regular gradient in forest structure and species composition from the base to the top of each hill. In the undisturbed valleys, lowland forests over

SPECIES OF INTERNATIONAL CONCERN

**Endangered:**
- Yucatan Black Howler: *Alouatta pigra*
- Central American Spider Monkey: *Ateles geoffroyi*
- Central American Tapir: *Tapirus bairdii*
- Fiddlewood: *Vitex gaumeri*

**Vulnerable:**
- Spanish Cedar: *Cedrela odorata*
- Great Curassow: *Crax rubra*
- Cerulean Warbler: *Dendroica cerulea*
- Gaussia Palm: *Gaussia maya*
- Mahogany: *Swietenia macrophylla*

*IUCN, 2010*
lime-rich alluvium can have a very high canopy, with emergent trees reaching 30m in height – some of the tallest forest in Belize. On the hill tops, the vegetation most closely resembles tropical evergreen broadleaf scrub forest on calcareous crags, with agaves, Clusia, Plumeria and orchids.

The forests are impacted by hunting, but still maintain a representative mammal and bird fauna, including the two species of primates – the endangered black howler and spider monkeys. Near St. Margaret’s, approximately 200 acres of forest is now under agriculture within the protected area.

**Landscape Context**

Five Blues Lake National Park contributes towards maintenance of forest connectivity between the Maya Mountains Massif and the Selva Maya forest, across the citrus valley that follows the North Stann Creek. St. Margaret’s Village / Santa Martha, considered the primary stakeholder community for the National Park, was established as a small farming community, but expanded rapidly in the 1980’s, following immigration from Guatemala and El Salvador. It now has an estimated population of 670 (AoS, 2007). Whilst a significant number of people commute to Belmopan to work, farming is still the primary economic base in the area, with significant subsistence hunting. A lime kiln is also active in the area, providing lime for the citrus and aquaculture industries, and creating increased pressure for firewood.

**History of Establishment**

Established in 1991 under Statutory Instrument 56, as a direct result of advocacy by the stakeholder community, to protect the complex of lagoons and surrounding forest in a landscape of agricultural expansion. The boundaries were rationalized and expanded in 1994 under Statutory Instrument 52 to better protect the suite of ecosystems present within the 4,061 acres.

**Management Regime**

Five Blues Lake National Park is managed under a co-management partnership between the Forest Department and the non-governmental community co-management partner, Association of Friends of Five Blues Lake National Park, and was established with the objective of bringing socio-economic benefits to St. Margaret’s village.
Gra Gra Lagoon National Park

Gra Gra Lagoon National Park lies immediately south of Dangriga in the Stann Creek District, encompassing a matrix of approximately 534 ha (1,320 acres) of lowland forest, mangrove, swamp forest and tall herbaceous swamp. An important coastal lagoon habitat for wetland birds and crocodiles, the area is also important for its environmental services – filtering of agrochemicals and sediments before water reaches the coast, and flood control functions during storm events.

Physical Features

The National Park, with the 300 acre (120 ha) Gra Gra Lagoon at its centre, lies on the central coastal plain, on a mixture of poor sandy and richer alluvial soils deposited by the South Stann Creek, over Recent Pleistocene bedrock. It lies within two small watersheds – the Yemeri Creek and Bocotora Creek Watersheds, which drain the agricultural lands of the adjacent coastal plain into the Gra Gra Lagoon system. The long and narrow shallow lagoon has a north-east / south-west alignment, with a single creek opening into the coastal waters.

Biodiversity

The dominant vegetation of the National Park is mangrove – both impressive tall basin mangrove and the lower mangrove scrub. This grades into herbaceous swamp to the west and forested areas, and then into inundated lowland swamp forest at the western boundary of the Park, interspersed with large areas of freshwater reed swamps.

A number of the ecosystems within the protected area are considered under-represented within the National Protected Areas System. The lagoon is important for waterbirds – herons, egrets, waders, terns, cormorants and blue winged teal which feed in the shallow waters. The herons and egrets also utilize the mangrove cayes as sheltered roosting and nesting sites, and Morelet’s crocodile rests in their shade. The forested areas provide shelter for the endangered Baird’s tapir.

ECOSYSTEMS

Under-represented in National Protected Areas System
- Caribbean mangrove forest; mixed mangrove scrub
- Caribbean mangrove forest; basin mangrove
- Brackish / saline lagoon
- Tropical freshwater reed swamp
- Tropical lowland tall herbaceous swamp
As a coastal wetland, the Gra Gra Lagoon system provides connectivity between the terrestrial/ freshwater and marine systems, and contributes to a number of environmental services. The extensive lagoon and wetlands play an important role in flood control during and after storm events, and maintain the quality of water outflow into the marine system, acting as an effective filter for the agro-industrial effluent and sediment from the watersheds, at current levels of development. With its protective mangroves, the lagoon also provides a safe haven for small craft during storms and hurricanes, particularly for local fishermen (Meerman et. al. 2005).

The Gra Gra Lagoon National Park is surrounded by private lands, including the outer limits of Dangriga to the north. Four stakeholder communities (Dangriga, Sarawee, Silk Grass and Hopkins) lie within the protected area landscape. The largest of these, Dangriga, has an estimated population of approximately 10,400. These communities have a focus on large scale citrus production, with subsistence farms also forming part of the cultural landscape. The coastal area is expanding in popularity as a tourism destination, resulting in all the southern banks of the Gra Gra Lagoon, between it and the sea being under private ownership, with private developers seeing opportunities for the development of tourism and residential properties.

The value in the establishment of Gra Gra Lagoon as a protected area was initially highlighted in 1994, resulting in the establishment of Friends of Gra Gra Lagoon. This was further strengthened in 1999, following identification of the importance of the area in mitigation of environmental impacts caused by the construction of an improved drainage infrastructure for Dangriga (Meerman et. al. 2005). Gra Gra Lagoon was established in 2002 (S.I. 86 of 2002) as a National Park, under the National Parks System Act, 1981.

Gra Gra Lagoon National Park is administered by the Forest Department and has, from its establishment in 2002, been co-managed by the Friends of Gra Gra Lagoon, a community based organization based in Dangriga.

Declared under the National Park designation - for the protection and preservation of natural and scenic values of national significance and for the benefit and enjoyment of the general public – the protected area is managed with the goal of maintaining the area’s value in terms of conserving biodiversity, providing critical ecological services, and contributing to the local economy and social well-being through recreational use. This allows for low-impact non-extractive activities such as education, tourism and research.
Guanacaste National Park is located in the north east of Cayo District north of the capital city Belmopan and lies on the southern bank of the Belize River, at its junction with Roaring Creek. The easily accessible entry point is located at the intersection of the Western Highway and Belmopan making this National Park a recreational area for Belizeans and International visitors. The park’s small size allows visitors to experience the biodiversity of a tropical forest making this park a symbolic conservation site and an important educational resource for schools and all visitors. Facilities include a Visitors Centre, bird deck, swimming deck and a well maintained trail system.

Physical Features

The National Park is situated on the alluvial floodplain of the Belize River, on limestone bedrock that breaks the surface of the soil in places. It is bordered to the north by the Belize River and to the west by Roaring Creek, a tributary that flows from the Maya Mountains. Three small seasonal streams dissect the protected area. To the east and south, the National Park boundary follows the Western Highway, and is located at the junction of Belmopan City.

A series of trails and trail infrastructure provides easy accessibility for people of all ages to scenic views of the river, tropical forest and wildlife within two miles of Belmopan, the capital city.

Biodiversity

Guanacaste National Park’s forest is now relatively mature secondary growth, regenerating from former use as pasture. It is lowland broadleaf forest, including riparian gallery forest along the edge of the Belize River, with tree species such as provision tree and spiny bamboo, adapted to the periodic flooding that occurs on the flood plain. The focal attraction of Guanacaste National Park was a large guanacaste tree with a heavy epiphyte load, that formed a central attraction of the protected area, and for which it was named. The tree, thought to be approximately 360 years old, recently died of senescence, but the park continues to boast many guanacaste trees that can easily be observed from the trails.

Internationally threatened species protected by Guanacaste National Park include the Spanish cedar and black howler monkey, and whilst small, the protected area supports a population of smaller mammals such as the jaguarundi, agouti, Yucatan squirrel, and armadillo. Recognized as an easily accessible birding site, approximately 125 species of birds have been recorded within the boundaries.

Landscape Context

Whilst Guanacaste National Park plays no significant landscape role within the protected areas system, it is one of the most visited protected areas by schools across Belize thus making it a very important educational.
resource. It is also important as a recreational area for Belizean and International visitors and is a popular recreational area for Belmopan residents, the largest adjacent settlement, estimated to have a population of approximately 12,300 (CSO, 2004). Just west of Guanacaste is the village of Roaring Creek Village, with approximately 1,650 residents, and a number of refugee settlements (Salvapan and Las Flores) have been established in the vicinity of Belmopan. Populated mostly by Salvadoraneans and Guatemalans, these communities have grown significantly over the past 10 to 12 years. The National Park’s proximity to these communities and the larger population centres of Belmopan and Roaring Creek has contributed to increasing demands and pressures on the protected area with increased hunting and fishing incursions, and security issues in recent years.

**History of Establishment**

Guanacaste National Park is national land, designated by Statutory Instrument under the National Parks System Act. The original 51.5 acre surveyed land parcel was part of the Belmopan Development Area before being zoned as a reserve within the development plan for the new city. It was established as a Crown Reserve in 1973, under the Crown Land Ordinance, and gained National Park Status in 1990. The freehold was given to Belize Audubon Society on condition that the site be managed as a bird sanctuary.

**Management Regime**

As a National Park, there are restrictions on activities that can take place within the area. Guanacaste is a non-extractive protected area, with the primary management goal of promoting understanding of nature and the environment, in order to foster respect for the park and its personnel among local citizens and visitors (Belize Audubon Society, 2010). Research, educational and recreational activities are permitted, but no extractive use (sustainable or otherwise) is allowed.

The Belize Audubon Society holds management responsibility for Guanacaste National Park under a co-management agreement with the Forest Department, (Ministry of Natural Resources). BAS is responsible for day-to-day management of Guanacaste National Park, including activities such as patrols, visitor management, fee collection, and scientific monitoring, whilst the Forest Department provides oversight and enforcement.
Honey Camp National Park

Lying on the Corozal / Orange Walk District Boundary, Honey Camp National Park is situated approximately 13 km east of Orange Walk Town, and approx 700m from Honey Camp Lagoon, a popular local recreation destination. 5km to the north are the extensive agricultural lands of the Mennonite community of Little Belize.

Physical Features

The lands of the National Park are low-lying and flat, as is characteristic of northern Belize. Situated within the Progresso Lagoon Watershed, on the Yucatan platform, drainage is westwards into Freshwater Creek, the north-easternmost fresh water creek on the limestone platform of north east Belize. Freshwater Creek then flows northwards into Progresso Lagoon itself.

Biodiversity

The National Park encompasses four ecosystems, three of which are classified under the single broad ecosystem of Tropical Evergreen Seasonal Broad-leaved Lowland Forest. On a national level, the tall variant of swamp forest is particularly important, as an ecosystem that is significantly under-represented within the national protected area system.

The critically endangered Central American river turtle (hicatee) was reported as occurring in Chiwa Lagoon (in the southern tip of the National Park as recently as 2006, but was not detected in a recent survey for this species (Rainwater, 2010, pers. comm.). Fish stocks are reportedly severely depleted, and game species are also believed to be severely impacted by illegal hunting.

The endangered Yucatan black howler monkey and Baird’s tapir, along with the vulnerable great curassow are presumed to still be present within the Park.
Lying immediately adjacent to the Freshwater Creek Forest Reserve, the National Park forms an important part of the Freshwater Creek forest node – a critical step in the maintenance of biological connectivity between the privately owned Shipstern Nature Reserve to the north-east, and Crooked Tree Wildlife Sanctuary to the south-west. It lies within a landscape of agricultural expansion – primarily sugar cane and cattle to the west and north-west, and extensive Mennonite farmlands of corn, beans and cattle to the north. Connectivity north-east to Shipstern is currently under significant threat from the purchase of land critical to connectivity by Mennonites, for further agricultural expansion.

The adjacent Freshwater Creek Forest Reserve has suffered repeated agricultural incursions, de-reservations, and ongoing timber rustling, with the higher legal status afforded to the National Park being aimed at strengthening natural resource management within this northern forest tract.

Honey Camp National Park was established under SI 65 of 2001, as a re-designation of a portion of Freshwater Creek Forest Reserve – itself first designated in 1926. Its establishment was largely in response to lobbying from the Association of Friends of Freshwater Creek Forest Reserve, to facilitate a higher level of protection and management for the area around Honey Camp Lagoon. Whilst the original focus was on Honey Camp Lagoon itself, the demand for development land on the lagoon edge led to this water body not being included within the boundaries.

The National Park is under the administration of the Forest Department, but lacks any on-site management. Previously, the local community-based organization Association of Friends of Freshwater Creek Forest Reserve was considered a co-manager of the National Park, but the organization is no longer active.

SITE INFORMATION

Size: 7,772 acres (3,145 ha)
Statutory Instrument: SI 65 of 2001
IUCN Category: II
Management Authority: Forest Department
Contact E-mail: fdsecretary@mnrei.gov.bz
Location: The National Park straddles the Corozal / Orange Walk District boundary, 13 km east of Orange Walk Town.
Uses: Non-extractive – tourism, education and research

Biodiversity Information: A biodiversity assessment and several archaeological studies have been undertaken, but reports are not accessible.
Management Plan: None
Visitor Facilities (2009): No facilities
Visitation (2009): No data
On-site Staff (2009): No staff
Laughing Bird Caye National Park

Laughing Bird Caye National Park, named for the Laughing Gulls that once nested there in large numbers, lies to the east-south-east of Placencia and is one of seven marine protected areas declared as a UNESCO World Heritage Site in 1996. The National Park is based around a long, narrow sand and shingle caye sitting on an elongated ridge of the most southern of Belize’s coral faro formations. Its beauty, high diversity of coral habitats and associated marine life, sandy beaches and clear, shallow waters, combined with its proximity to Placencia, has made it a popular tourist destination for over 20 years.

Physical Features

The Laughing Bird faro (an angular atoll situated on a continental shelf, also known as a shelf atoll) rises out of deep water, with the Victoria Channel to the east and the inner lagoon to the west. It can be divided into three distinct areas; rim top, inner flank, and outer flank. The rim of the faro is a nearly continuous ring of relatively narrow reef enclosing a central lagoon area, with several ridges that project inwards. The inner lagoon is completely enclosed and reaches a maximum depth of 5m. Patch reefs and mounds, diverse in size and structure, criss-cross the inner lagoon across a floor that is nearly flat, with a fine mud substrate. To the outside, the walls drop an average of 100 feet into the deep channels that surround the faro.

Biodiversity Evaluation

The Laughing Bird faro is considered to be one of the best examples of faro formation in the Caribbean, and is recognized for supporting extraordinarily high biological diversity, displaying a wide range of habitats and providing protection for at least twenty two species of international concern. There has, however, been significant damage to the corals during the earth tremors in 2009, with extensive slippage of the north-east facing faro walls.

The protected waters of Laughing Bird Caye National Park serve as an important source for conch, with high densities of reproductive adults being recorded within the park. Other species such as lobster and finfish also flourish within the park boundaries, providing a source area for the fisheries industry. The sandy beaches of the caye itself provide crucial nesting grounds for hawksbill turtles, and the remaining littoral forest and herbaceous beach vegetation supports a number of nesting birds and provides a stopping point for migratory birds.
Laughing Bird Caye National Park is part of the Belize Barrier Reef System, and lies within the regional Mesoamerican Barrier Reef System. It is also a component of the system-level management unit of the Southern Belize Reef Complex, a seascape planning unit that includes South Water Caye, Sapodilla Cayes and Gladden Spit and Silk Cayes Marine Reserves. The National Park is an important tourism resource for adjacent coastal communities – particularly Placencia, providing an idyllic, accessible location with good reef for divers and snorkelers, and contributing significantly to the economy of the area.

As a non-extractive conservation area, the National Park provides a source area important for the maintenance of a number of local commercial marine species, contributing to the sustainability of the fishing industry in both adjacent and northern coastal communities.

The 1.4 acres of Laughing Bird Caye was originally declared a protected area in 1991 under the National Parks System Act (SI 167 of 1991), to cover the caye itself and immediate waters, following recognition by local stakeholders of the need for greater regulation if the qualities of the area were to be maintained. The park has subsequently been extended to 10,119 acres (4,095 ha), prompted by its inclusion in the World Heritage Site, to include the entire faro, to protect the unique biodiversity associated with the faro, and to manage, protect and promote the sustainable use of Laughing Bird Caye National Park for the benefit of present and future generations. The National Park falls under the IUCN Category II (a protected area managed primarily for ecosystem protection and recreation).

In keeping with its designation as a National Park, LBCNP is a completely no-take protected area, with the management goal of protecting the unique biodiversity associated with the faro, and to manage, protect and promote the sustainable use of the National Park for the benefit of present and future generations. Administrative responsibility for Laughing Bird Caye National Park is held by the Forest Department, and the area is managed through a collaborative partnership with the Southern Environmental Association (SEA). SEA is responsible for day-to-day management of the reserve, including activities such as patrols, fee collection, and scientific monitoring.
Mayflower Bocawina is located in Stann Creek District south of the Hummingbird Highway and west of the Southern Highway. The hilly terrain, with its impressive, tall tropical forest and its rich bird life, encompasses three archaeological sites, which have received significant attention under the Mayflower Archaeological Project.

**Physical Features**

Mayflower Bocawina lies adjacent to the Sittee River Forest Reserve, in the eastern portion of the Maya Mountains Massif. Situated on the hard Santa Rosa metasedimentary rocks, the National Park is characterized by steep rugged hills, bisected by creeks that drain into the North Stann Creek, Silk Grass Creek and Freshwater Creek.

Attractions in the form of spectacular waterfalls and three Maya sites (the Mayflower Maya Site, Maintzunun and T’au Witz) form a central focus of the protected area, with a trail system linking these resources.

**Biodiversity**

The majority of the forest of Mayflower Bocawina National Park is **Tropical evergreen seasonal broad-leaved lowland hill forest**: *Simaruba - Terminalia variant*, with some **Tropical evergreen seasonal broad-leaved lowland forest over poor or sandy soils** occurring in the eastern portion of the National Park. Tall trees grow even on the steep and rugged hill slopes of the protected area. Higher ridge tops support lower forest, often predominated by **Clusia sp.** and with an increased abundance of Philodendrons - species usually associated with hill forests at slightly higher elevations. Mahogany is relatively common at lower elevations, and Santa Maria is locally very abundant on the higher slopes. Remnants of past plantations of mahogany and the exotics gmelina and teak can still be seen in the lower areas in the eastern portion of the Park (Meerman, et. al., 2003).

Several threatened species have been recorded in the area, including the endangered Yucatan black howler monkey, spider monkey and Baird’s tapir (Meerman, et. al., 2003), and the sabrinus and Sanderson’s rain frogs (Walker, 2008).

A number of vulnerable species also occur here - Spanish cedar and mahogany, great curassow, crested guan and keel-billed motmot. Other species of note include the ocellated turkey (Meerman, et. al., 2003) and the water opossum (Walker, 2008).
Hunting within the National Park is reported as ongoing, and originating from Silk Grass, Dangriga, Hopkins, Sittee River, Stann Creek Valley communities (Meerman, 2003).

### Landscape Context

Though not included in the adjacent Maya Mountains Massif system-level planning unit, Mayflower Bocawina National Park is geologically and ecologically part of this system. Immediately adjacent to the Sittee River Forest Reserve, the National Park increases national coverage of the ecosystems it encompasses. It provides a route of biological connectivity between the Maya Mountains Massif and the coastal plain, but the watershed protection afforded by the protected area is perhaps its most important function. The National Park lies just south of the communities of Steadfast, Alta Vista and Pomona, within both the Freshwater Creek and North Stann Creek watersheds, and helps protect portions of the North Stann Creek watershed, providing water security and quality, as well as assisting in flood control, for Dangriga, approximately 15 km downstream, and for the expanding human population and extensive agriculture lying between the National Park and the coast.

### History of Establishment

The National Park was designated under SI 139 of 2001, incorporating areas that were previously within Sittee River, Silk Grass, and Commerce Bight Forest Reserves.

### Management Regime

Mayflower Bocawina National Park is administered by the Forest Department, and is co-managed by the Friends of Mayflower Bocawina.

The National Park designation supports the protection of the watersheds, and allows for low-impact non-extractive activities such as education, tourism and research activities.

### SITE INFORMATION

- **Size**: 7,087 acres (2,868 ha)
- **Statutory Instrument**: SI 139 of 2001
- **IUCN Category**: II
- **Management Authority**: Forest Department
- **Co-management Partner**: Friends of Mayflower Bocawina
- **Contact E-mail**: friendsofmayflower@hotmail.com
- **Location**: Mayflower Bocawina National Park is located south of the Stann Creek Valley, and west of the Southern Highway, adjacent to the Sittee River Forest Reserve,
- **Uses**: Non-extractive – tourism, education and research.
- **Biodiversity information**: Rapid assessment (Meerman, et. al, 2003)
- **Management Plan**: No plan
- **Facilities (2009)**: Visitor Centre
- **Tourism Visitation (2009)**: No data
- **On-site Staff (2009)**: 1 volunteer ranger (part time)
Noj Ka’ax H’Men Elijio Panti National Park

Noj Ka’ax H’Men Elijio Panti National Park, named for the traditional healer, Don Elijio Panti, is an integral part of the Maya Mountains Massif System and considered important for its role in protection of the ecosystems, watershed and cultural values of the area. It is also recognised within the National Protected Areas System in its role as a community co-managed protected area, providing benefits for community stakeholders as a local tourism resource, and a mechanism for community participation in conservation management activities.

Physical Features

Elijio Panti National Park lies on the periphery of the Maya Mountains Massif, which dominates the south west of Belize, the upper elevation topography consisting primarily of hard Santa Rosa group metasedimentary rocks (seen in the National Park in the slate that gives Slate Creek its name), with remnants of the Cretaceous limestone that once blanketed the Maya Mountains. This limestone can still be seen in the northern and central areas of the National Park. Here, characteristic landscape features are the rugged limestone topography of vertical-sided sinkholes, underground streams and caves. The Offering Cave, so called because of the large number of Maya ceremonial vessels discovered there, is the best known, and has a surveyed length of approximately 2,800ft, sinking to a depth of approximately 150ft.

Water is scarce in this karst landscape, especially during the dry months, and smaller streams that emerge as springs within the hill slopes then disappear underground again after flowing a short distance. The more permanent hydrological features to the west are the Macal (the Eastern Branch of the Belize River) - and a series of tributaries (Rio On and Privassion Creek to the south-west, and Little Vaqueros Creek to the south east), which define some of the boundaries of the protected area.

Biodiversity

The predominant vegetation in the north-west and central limestone karst areas of the National Park is broadly defined as tropical evergreen broadleaf lowland forest. The ecosystems overlying the more nutrient-poor meta-sedimentary rocks in the rest of the protected area are dominated by pine, with a matrix of needle-leaf and broadleaf forests in the transitional areas, characterized by a needle-leaf forest landscape with broadleaf forest on limestone outcrops. Riparian shrubland is found in association with the mountain creeks and the Macal River.

SPECIES OF INTERNATIONAL CONCERN

<table>
<thead>
<tr>
<th>Critically Endangered</th>
<th>Agalychnis moreletii</th>
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<tbody>
<tr>
<td>Morelet’s Treefrog*</td>
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<table>
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<tr>
<td>Yucatan Black Howler</td>
<td>Alouatta pigra</td>
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<tr>
<td>Sabrinus Rain Frog</td>
<td>Eleutherodactylus sabrinus</td>
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<tr>
<td>Baird’s Tapir</td>
<td>Tapirus bairdii</td>
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<td>Fiddlewood</td>
<td>Vitex gaumeri</td>
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<td>Electron carinatum</td>
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<td>Leprus Chirping</td>
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<td>Rain Frog</td>
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<tr>
<td>Georgia Palm</td>
<td>Gaussia maya</td>
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<tr>
<td>Mountain Pimento</td>
<td>Schippia concolor</td>
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<tr>
<td>Mahogany</td>
<td>Swietenia macrophylla</td>
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*Expected, but to be confirmed
A representative mammal and bird population is present, though depressed by hunting pressure. White-lipped peccary, considered an important indicator of hunting pressure, has been reported within the protected area, though Elijio Panti National Park, on its own, is not large enough to support a herd of this wide-ranging species, with connectivity with the Maya Mountains Massif being essential to the continued presence of this and several of the larger species within the National Park.

Elijio Panti National Park is one of fourteen contiguous protected areas that together form the Maya Mountains Massif. The Massif is considered regionally and globally important in providing a critical landscape function as one of only a few remaining large, intact forest blocks within the Mesoamerica region, critical in the maintenance of regional biodiversity. As one of Belize’s three national priority areas, the Massif is important in its role in maintaining viable populations of many threatened species, and the protection of watershed functionality, critical for communities in both Belize and Guatemala.

Within the local landscape, there is general recognition of the importance of maintaining the National Park as protection for water catchments, for educational and scenic values and for its value as a tourism resource, in the stakeholder communities of San Antonio, Progresso / Seven Miles and Cristo Rey. San Antonio also sees the National Park as a cultural resource, for the maintenance and harvesting of traditional medicinal plants, as well as providing a source of local game species (favoured as a traditional cultural food), for hunters in the adjoining forested areas. These environmental services are considered particularly important, with the increasing clearance of forest for agriculture and tourism developments. This increasing human footprint in the San Antonio area has resulted in some conflict with the National Park status in recent years, with the integrity of the protected area being under threat.

Transboundary incursions from Guatemala are also impacting the protected area, with the illegal harvesting of xate, along with associated hunting and looting activities. There have also been impacts from the construction of the Vaca Dam, on the Macal River on the boundary of the protected area.

Elijio Panti National Park was created as a joint initiative by local communities (San Antonio, 7-Miles and Christo Rey) to ensure that the natural values of the broadleaf and needle-leaf forests of the area were not lost through uncontrolled development. The National Park was established in 2001 as a buffer on the northern edge of the Mountain Pine Ridge Forest Reserve, and to protect the biodiversity, and more specifically, the medicinal plant resources of the area. The current National Park area was part of a larger parcel of national lands that was originally sought by San Antonio, the principle stakeholder community, as an extension to village farmlands, with a portion retained in its natural state as a village resource, to ensure continued availability of forest products and ecosystem services into the future.
Management Regime

Elijio National Park is administered by the Forest Department and has, from its establishment in 2001, been co-managed by the Itzamna Society, a community based organization in San Antonio. In 2008/2009, co-management transitioned to the Belize Development Foundation, another community based organization, also based in San Antonio.

The National Park designation allows for low-impact non-extractive activities such as, education, tourism and research activities; medicinal plant harvesting, though it is extractive, has been highlighted as an important use by local residents, this area having been used for medicinal harvesting even prior to it being established a protected area. Whilst this activity does not fall under the permissible activities under this designation, it continues at very low levels within the National Park. The designation of the park is not, however, intended to cause a shift in tradition but rather it seeks to maintain the culture of buffer communities. The archaeological artefacts and caves lie under the mandate of the Institute of Archaeology.

SITE INFORMATION

Size: 12,657 acres (5,122 ha)  
Statutory Instrument: SI 177 of 2001  
IUCN Category: II  
Management Authority: Forest Department  
Co-management Partner: Belize Development Foundation (BDF)  
Location: The National Park lies in Cayo District, on the northern slopes of the Maya Mountains Massif, south of San Antonio  
Uses: Non-extractive – tourism, education and research  
Visitor Facilities (2009): Education Centre, 2 Camping Sites  
Visitation (2009): No data  
On-site Staff (2009): 1 ranger

Xibalba...entrance to the underworld

The Offering Cave, so called because of the large number of ceremonial vessels left by the Maya, is characteristic of the limestone karst areas of Belize, and is currently managed as part of Elijio Panti National Park, in collaboration with the Institute of Archaeology. With large caverns and stunning cave structures – stalagmites, rising from the cave floor, and stalactites that hang from the ceiling – caves such as this are often guardians to knowledge on the past Maya civilization, some two thousand years ago.

Caves throughout Belize played a central role in Maya religion, being seen as the entrance to the underworld - places alive with spiritual power. Signs of ritual offerings to the gods can still be seen – a link to the people who once lived, worked and worshipped in Belize.
Payne’s Creek National Park

Payne’s Creek National Park is situated in Toledo District, the most southerly of Belize’s six districts, and protects approximately 37,680 acres of hypersaline, saline, brackish and freshwater wetland habitats, mangroves, broadleaf forest and savanna, and wildlife. It was designated to protect distinctive physical features, including the Punta Ycacos Lagoon system itself, and the extensive sequence of coastal ridges and intervening pond systems formed from sediment discharged from Monkey River (Zisman, 1996). Unfortunately, most of the coastal ridges, Punta Negra lagoon, and Punta Ycacos Lagoon have since been excluded following a realignment of the boundaries. The realignment also led to the inclusion of pine savanna to the west and north-west, excised from Deep River Forest Reserve.

Payne’s Creek is considered important in providing connectivity between the Maya Mountains and the reef, in watershed protection, protection of wildlife and protection of cultural heritage.

Physical Features

Situated on the Southern Coastal Plain, the terrain is flat and low-lying, with seasonal inundation. The majority of soils are sandy and poor, resulting from deposition of sediments eroded from the Santa Rosa metasediments of the Maya Mountains Massif. The exceptions are the alluvial soils deposited along the river floodplain, containing enriching limestone,

Payne’s Creek National Park encompasses the majority of the Payne’s Creek watershed, an important storage area for freshwater during the wet season, with extensive inundation of the wetland and pine savannas. This water is then released more slowly into the Punta Ycacos lagoon system, and from there into the Gulf of Honduras.

Biodiversity

Payne’s Creek National Park is a matrix of broadleaf forest, short grass and pine savannah, herbaceous and mangrove swamps, that provides protection for a representative array of Belize’s mammals, including the endangered Central American tapir and the Yucatan black howler monkey. Deep River, forming one boundary of the protected area, has been highlighted for its local importance for the West Indian manatee, which also frequent Punta Ycacos Lagoon.

The Payne’s Creek lagoon system provides a congregation site for cow-nosed rays, and fringing mangrove and
mangrove cayes provide the structure for a nesting colony of white Ibis, bare-throated tiger herons and other waterbirds. The critically endangered hawksbill turtle has been recorded nesting on the beaches adjacent to the protected area, near Punta Negra. The protected area is also home and wintering grounds for just under 300 species of birds, including the yellow-headed parrot, jabiru stork, muscovy duck and the aplomado falcon, many utilizing the expanse of pine savanna that surrounds the lagoon system. The density and extent of pines in the lowland pine forest and savanna is significantly reduced from past levels – the result of combined impacts of past logging and increasing frequency of anthropogenic fires. The endangered yellow headed parrot, which nests in the pine trees of the National Park, has faced massive declines over the past twenty five years as a result of these fires, and from the harvesting of nestlings.

The broadleaf forest has also been subject to significant impact from Hurricane Iris, in October 2001, with sustained winds in excess of 140mph. the northeastern broadleaf forest areas of Payne’s Creek were severely affected, lying within the 90 to 100% destruction belt, with total defoliation, and the majority of standing trees delimbed.

**Landscape Context**

Payne’s Creek National Park contributes to the Maya Mountain Marine Corridor, a national system-level planning unit, providing the interface between the terrestrial and marine components, maintaining the inter-relations between them, and preventing fragmentation.

The lagoon system and associated inundated mangroves and wetlands assist in the maintenance of the water qualities essential for the health of the coral reef in the Gulf of Honduras.

Before designation as a protected area, the park was traditionally used for fishing and hunting, and prior to the 1990’s, was also heavily impacted by commercial logging, particularly during the dry season. The income of the communities adjacent to PCNP (Monkey River Village, Punta Negra Village and Punta Gorda) is generally low, and despite large agricultural areas (banana, mango and citrus farms), there is little infrastructure in the area to support much employment.

Current use of the wetlands includes world-class fly-fishing tours - the Punta Ycacos Lagoon is considered excellent habitat for the elusive permit, with 200+ people using the site annually for fly fishing, making it a significant tourism resource for the area (Muschamp, pers com.). Local guides also use the nature trails that run through the riparian forest along the Monkey River and into the protected area, focusing primarily on the Yucatan black howler monkeys. This species has also been the target of research activities within the protected area and adjacent riverside forest (Pavelka et. al. 2003)

Within the protected area’s boundaries, archaeologists have uncovered inundated ancient Maya sites in the lagoon dating from 1300 BC, and believed to be involved in salt manufacture, and. This has led to increased recognition of the area for its archaeological importance, with ongoing archaeological research into the four sites discovered to date.
History of Establishment

The National Park was declared as a protected area in May 1994 (SI 43 of 1994), under the National Parks System Act. The designation was later amended in 2004 (SI 149 of 2004) following realignment of the protected area boundaries to include pine savanna to the west and north west, excised from Deep River Forest Reserve. It also led to the exclusion of most of the coastal ridges, Punta Negra lagoon, and Punta Ycacos Lagoon itself.

Management Regime

Legislative responsibility for Payne’s Creek National Park lies with the Forest Department, with on-site management through a co-management partnership with the Toledo Institute for Development and the Environment (TIDE). An Advisory Committee of community members representing Monkey River, Punta Negra and Punta Gorda, and Government and non-Government stakeholders assists with management decisions.

SITE INFORMATION

Size: 36,421 acres (14,739 ha)
Statutory Instrument: SI 149 of 2004
Original SI: 43 of 1994
IUCN Category: II
Management Authority: Forest Department
Co-management Partner: Toledo Institute for Development and the Environment (TIDE)
Contact E-mail: info@tidebelize.org
Website: www.tidebelize.org

Location: Payne’s Creek National Park is situated in Toledo District, in the south of Belize. The National Park lies just south of the Monkey River, extending southwards to the banks of Punta Ycacos Lagoon, and delineated by Deep River to the west

Uses: Non-extractive – tourism, education and research.
Biodiversity information: Initial assessment in archaeological studies has been ongoing (Mckillop), as have studies on howler monkeys (Pavelka et. al.). A biodiversity assessment was conducted in 2005 (Walker et. al.).
Management Plan: TIDE, 2005
Facilities (2009): Ranger’s station
Tourism Visitation (2009): No data
On-site Staff (2009): 1 site manager, 1 head ranger, 2 rangers, supported by the TIDE office staff, based in Punta Gorda

The Yellow headed Parrot (Amazona oratrix)

Once common throughout the coastal savannas of Belize, the range of this species has contracted to small, fragmented pockets of pine savanna, including that of Payne’s Creek National Park. Though once more widely distributed, the sub-species Amazona oratrix belizensis is now restricted to the lowland pine savanna of Belize and northern Honduras, and is one of the most threatened birds in Belize, being internationally recognized as Endangered, following a decline of 90% throughout its range over a twenty year period, to an estimated 7,000 individuals in 1994 (IUCN Redlist). In the last ten years alone, the population is thought to have decreased by a further 68%, with increased habitat destruction for development, increased man-made fires over the pine savanna areas, and the theft of nestlings for the pet trade (Birdlife, 2004). Fortunately, the rate of decline has not been as severe in Belize as in other parts of its range, and Belize is now considered the last remaining stronghold for this species - with some populations still being considered viable. Specific conservation measures are being conducted in Payne's Creek (and Rio Bravo) to aid the species recovery.
Peccary Hills National Park

Designated in 2007 in recognition of the high biodiversity of the area, and the connectivity provided between the north-eastern foothills of the Maya Mountains Massif and the coastal ecosystems of Northern Lagoon, the Peccary Hills National Park encompasses scenic pine savannas to the east and broadleaved forest to the west, covering the eastern most peaks of the Peccary Hills. Despite being within a few km of Belize City, this area is isolated from many of the development impacts by the Sibun River, which acts as a barrier to incursions, resulting in rich wildlife in a varied matrix of ecosystems, and a number of impressive karst caves with significant archaeological value.

Physical Features

A landscape of flat, coastal plan on Pleistocene limestone, with the Peccary Hills – steep, karst towers of later limestone deposits (Paleocene – Eocene) - rising abruptly out of the plain, to the north west. The area is located in the Sibun-Manatee karst region, the most north-easterly of the eight karst regions that have been identified in Belize (Miller, 1996), and the southern-most extent of the Yucatan limestone shelf.

The area is bisected by Freshwater Creek, which drains eastwards into Northern Lagoon. Small creeks from the swamp forests and sheet runoff from the savanna, drain into Freshwater Creek, then empty into Northern Lagoon, one of two large lagoons within the Central Watershed Region. This is then linked with the sea, through Burdon Canal to the north, and the Southern Lagoon to the south. During storm events, water backs up this network of creeks, leading to inundation of much of the surrounding savanna area, exacerbated by the low permeability of the sub-soil.

Biodiversity

Sixteen ecosystems have been identified within the National Park, in a mosaic reflecting the underlying geology, hydrology and topography. Included within this mosaic is tropical evergreen seasonal broadleaf lowland swamp forest: high variant – an ecosystem significantly under-represented in the National Protected Area System. The flora of the Peccary Hills National Park area is notable in being the type locality for the nationally endemic Louteridium chartaceum and Passiflora urbaniana, and for the relative abundance of species of conservation concern – including the vulnerable Spanish cedar (Cedrela odorata), the Gaussia palm (Gaussia maya) and big-leaf mahogany (Swietenia macrophylla).

Freshwater Creek is one of the few remaining protected refuges for breeding populations of the critically endangered Central American river turtle (hicatee). The critically endangered goliath grouper is also recorded in this same creek, where it joins the brackish Northern Lagoon. The Endangered Yucatan black howler monkey,
Central American spider monkey and Baird’s tapir are also both found within the Park, and the West Indian manatee (classed as Vulnerable) is known to enter the lower reaches of Freshwater Creek. The globally endangered (and nationally critically endangered) yellow-headed parrot reported as previously present, may no longer use the savannas as a breeding population because of the increased frequency of anthropogenic fires and resultant decline in pine density. The Vulnerable great curassow ranges through the broadleaf forests of the Peccary Hills, as does the Cerulean warbler.

### Landscape Context

Lying in the Northern Lagoon watershed, the Peccary Hills play a critical role both nationally and regionally in the maintenance of connectivity between the Maya Mountains Massif and La Selva Maya, and to a lesser extent between the Maya Mountains and the coastal ecosystems of Northern Lagoon and beyond. Immediately to the west is the privately owned Peccary Hills property (managed as a conservation area) and the contiguous Runaway Creek Nature Preserve. Direct connectivity with the Manatee Forest Reserve, to the south, has been lost through boundary realignments of the latter – though functional connectivity remains through the contiguous habitats.

With the area’s proximity to Belize City, the flood control functions of the savanna are critical, the savannas acting as a huge flood relief system.

### History of Establishment

The area has a long history of use for tourism, with recent initiatives linked with the cruise ship day market, focused on the scenic forest trails and caves. The National Park was established in 2007 (SI 121 of 2007), following biodiversity assessments of the area and lobbying for the area to be protected and developed as a tourism resource, spear-headed by a local NGO, GRACE.

### Management Regime

Peccary Hills National Park is administered by the Forest Department, and has a co-management presence from the Gracie Rock Reserve for Adventure, Culture & Eco-Tourism (GRACE).

The National Park designation supports the protection of the watersheds, and allows for low-impact non-extractive activities such as, education, tourism and research activities.
Rio Blanco National Park

Rio Blanco National Park, situated in western Toledo District, encompasses an area of approximately 94 acres consisting of secondary broadleaf forest surrounding an impressive waterfall and plunge pool that has long been used as a local recreational area. It was established to preserve this feature and to provide opportunities for ecotourism benefits to the adjacent communities.

Physical Features

The main feature of the Park is the stunning cascading waterfall, spilling over a 6m high and 30m wide limestone ledge with a 5m deep pool that is popular for swimming and recreation. Lying in the Moho River Watershed in western Toledo, the landscape is of rolling karstic hills dotted with sinkholes. The Rio Blanco itself runs eastwards then disappears underground as it passes through steeper karstic hills, before re-emerging as Blue Creek, upstream from Blue Creek Village, outside the protected area. Blue Creek then joins Black Creek from the Aguacaliente Wildlife Sanctuary before merging with the Moho River further downstream.

Biodiversity

Only limited assessment of the biodiversity of Rio Blanco has been undertaken to date. Established primarily for the preservation of the scenic waterfall and to provide a focus for local tourism development, the vegetation of the Park had been cleared for milpa farming prior to its designation, and was subsequently significantly impacted by Hurricane Iris in 2001. Technically described as Deciduous broad-leaved lowland disturbed shrubland, the young secondary forest is expected to regenerate towards Tropical evergreen broad-leaved lowland hill forest on rolling karstic hills over the coming decades, with potential to eventually attain a canopy height in excess of 30m. A rapid survey of the vegetation identified many of the species typical of this forest type, including the vulnerable mahogany and Spanish cedar (Meerman, 2001). It is presumed that the endangered Baird’s tapir still occurs in the Park, though would require contiguous forested areas outside the Park as well for a viable population.

The forest is assessed as being at high risk from fire – particularly with its location within a landscape of shifting milpa agriculture, characterized by annual burning. Hunting is also identified as a significant threat to the biodiversity of the Park.

Landscape Context

The Rio Blanco National Park lies approximately 6km from the southern boundary of the Columbia River Forest Reserve, within a heavily human-impacted landscape of shifting milpa agriculture, biological connectivity is somewhat limited – with species diversity being expected to decline in the medium to long-term through...
increasing genetic isolation of the National Parks wildlife. The main value of the Park is therefore the preservation of the scenic beauty of the Rio Blanco Waterfall.

The National Park lies within the Moho River Watershed, adjacent to two communities - Santa Cruz and Santa Elena, both of which are involved in co-management activities. Other nearby communities include Pueblo Viejo, San Antonio, San Jose and Blue Creek. With significant and broad-scale poverty in the human landscape surrounding the National Park, and increased immigration from neighbouring Guatemala, pressures on its natural resources can be expected to continue.

**History of Establishment**

Rio Blanco was designated as a National Park in 1994, under Statutory Instrument 41, in response to lobbying for protection for its scenic values and ecotourism potential, by the Toledo Eco-tourism Association and villagers from the nearby communities of Santa Cruz and Santa Elena.

**Management Regime**

The National Park is under the administration of the Forest Department, with co-management by the Rio Blanco Mayan Association – established by community members from Santa Cruz and Santa Elena.

**SITE INFORMATION**

- **Size:** 94 acres (38 ha)
- **Statutory Instrument:** SI 41 of 1994
- **IUCN Category:** II
- **Management Authority:** Forest Department
- **Contact E-mail:** fdsecretary@mnrei.gov.bz
- **Location:** The National Park lies in western Toledo District, adjacent to Santa Cruz and Santa Elena, some 6-10 km south of the Columbia River Forest Reserve.
- **Uses:** Non-extractive – tourism, education and research
- **Biodiversity Information:** Floristic guide to common plants (Meereman, 2001).
- **Management Plan:** None
- **Visitor Facilities (2009):** Visitor Centre
- **Visitation (2007):** 1,784
- **On-site Staff (2009):** 7 voluntary part time members
As Belize’s southernmost protected area, the Sarstoon-Temash National Park southern boundary is demarcated by the Sarstoon River, the border with Guatemala, and by the Caribbean Sea to the east. Encompassing 41,855 acres, Sarstoon-Temash is one of Belize’s larger National Parks.

**Physical Features**

Virtually all of the National Park lies on the Southern Coastal Plain, at substantially less than 5m above sea level. A single steep hill with a very small footprint rises sharply to 100m in the northernmost tip of the Park, in an area of karstic limestone of the Paleocene Late Cretaceous era.

The northern half of the protected area lies in the Temash Watershed, whilst the southern half of the Park lies in the Sarstoon Watershed.

**Biodiversity**

A total of 14 natural ecosystems have been identified within the National Park, ranging from coastal fringe mangrove to swamp and lowland hill forests. A number of these are under-represented within the National Protected Area System, and one - Tropical evergreen lowland peat shrubland with Sphagnum - is only known regionally from Sarstoon-Temash.

A species that has become emblematic for the National Park is the comfrey palm (*Manicaria saccifera*), restricted to Toledo District in its range in Belize, and largely confined to the protected area itself – where it occurs in extensive stands along the watercourses and swamp forests.

The critically endangered Central American river turtle (*Dermatemys mawii*) still occurs in the National Park, and indeed this may be one of the few remaining viable populations of this species, which has disappeared from much of Central America, and is experiencing a rapid decline throughout Belize as a result of hunting pressure. The endangered Yucatan black howler monkey and Baird’s tapir occur in the Park, and the vulnerable West Indian Manatee is recorded significant distances up the rivers.

Hunting pressure within the Park is described as extreme, with species such as the vulnerable great curassow, and the white-lipped peccary, highlighted as a species of national concern, both being reported as having been extirpated from the area by 2003 (Meerman, 2003), though hunting pressure is reported to have been reduced since then (SATIIM, pers. com.). Other threats to the biodiversity and integrity of the National Park...
include illegal logging, hunting, fishing, agricultural incursions, and fire, overlain by transboundary incursions from Guatemala.

**Landscape Context**

The Sarstoon-Temash National Park occupies approximately 41,855 acres in the south-eastern corner of Belize. It is bordered by the Caribbean Sea to the east and by the Sarstoon River and Guatemala to the south. To the north and west lie several communities with farmland extending in places to the park boundaries. The remainder of the protected area is bounded by private and public landholdings.

Sarstoon-Temash is named after the two rivers and watersheds within which it lies - the Sarstoon and the Temash. The National Park lies within a landscape of growing human population and significant anthropogenic change. Stakeholder communities include Midway, Conejo, Crique Sarco, Sunday Wood and Barranco, and Punta Gorda which lies 18km north. On the Guatemala side of the border (running mid-stream in the Sarstoon River) is the community of Sarstoon, which has historically accessed the natural resources of the National Park.

Biologically the Park is very isolated from the remainder of the national protected areas, existing linkages over non-protected lands being tenuous, with corridor functionality likely to be lost within 10-20 years (Meerman, 2003). Encompassing such under-represented and unique ecosystems as the sphagnum moss, and with such limited biological connectivity, it is critical that the biodiversity of the National Park be effectively conserved – as reported species losses from hunting are unlikely to be replaced naturally.

**History of Establishment**

Sarstoon-Temash National Park was designated under SI 42 of 1994, with a modest boundary alignment being implemented six years later (SI 22 of 2000). Part of the initial rationale for its establishment was to protect its extensive mangrove ecosystems, though subsequent surveys have shown that the area is also important for protection of other representative systems.

**Management Regime**

The National Park is under the administration of the Forest Department, and is managed under a co-management agreement with the Sarstoon-Temash Institute for Indigenous Development (SATIIM) – an organization made up of representatives from the five buffer zone communities of Midway, Conejo, Crique Sarco, Sunday Wood and Barranco. In addition, SATIIM has representation from the National Garifuna Council, Kekchi Council of Belize, Toledo Alcaldes Association and the Forest Department.
St. Herman’s Blue Hole National Park

The 574.5-acre St. Herman’s Blue Hole National Park, conveniently located 12 miles on the Hummingbird Highway southwest of Belmopan City, is a popular recreational site, attracting local and international visitors, with the clear waters of the karstic sinkhole, and the accessible cave system, both characteristic of the karstic landscape, within a tropical forest known for its excellent birding.

The park’s unique geological features and biodiversity also provides a variety of educational opportunities making it a key educational resource for schools across Belize. Flowing water emerges from the base of the deep, collapsed karst sinkhole, forming the pool from which the park receives its name. It then disappears once more into a second cave, eventually flowing into Caves Branch, a tributary to the Sibun River.

St. Herman’s Cave is of archaeological importance, with Maya using it during the Classic Period, as demonstrated by the pottery vessels, spears, and torches found there. The Blue Hole and St. Herman’s Cave are linked by the water that flows through them.

Physical Features

Elevations range from about 60m above sea level at the access point on the Hummingbird Highway, to over 200m in the hilly interior, covering a steep, well developed, karstic terrain of limestone cliffs and caves. St Herman’s Cave, one of the two primary features of the National Park, stretches about 770m from mouth to mouth, emerging on the far side of the steep hill slope, and exceeds 15m in height and 30m in width in places. The cave’s stream, a tributary of Caves Branch, still flows through the original cave system and is perennial, though its water levels vary considerably according to season and rainfall. The limestone hill slopes are dotted by other caves, as well, though only the Crystal Cave (or Mountain Cow Cave) is open to visitation, with its huge, crystalline-lined caverns.

The sink hole, 30 meters deep and 90 meters in diameter, was created by the roof collapse of an underground limestone cave. A river flows through it, forming a clear sapphire-coloured, deep pool at the base, and providing a sheltered aquatic ecosystem for several fish species, as well as a popular bathing area, before returning underground.

Biodiversity

The forest contains the representative species expected from a low impact tropical forest in Belize, including at least ten species of international concern. Two primary ecosystems are protected by St. Herman’s Blue Hole National Park – Tropical evergreen seasonal broad-leaved lowland hill forest on steep karstic terrain and Tropical evergreen seasonal broad-leaved lowland hill forest on rolling karstic terrain - both are limestone-loving tropical broad-leaf forests.

SPECIES OF INTERNATIONAL CONCERN

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<th>Category</th>
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<td></td>
<td>Baird’s Tapir Tapirus bairdii</td>
</tr>
<tr>
<td>Vulnerable</td>
<td>Great Curassow Crax rubra</td>
</tr>
<tr>
<td></td>
<td>Mahogany Swietenia macrophylla</td>
</tr>
<tr>
<td></td>
<td>Crested Guan Penelope purpurascens</td>
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</table>
Not only is the area important in providing protection for at least ten species of international concern, but it is also an important component in the representation of karstic limestone features within the National Protected Areas System. The park is also home to approximately 226 species of birds including species of conservation concern such as the Great Curassow, Crested Guan, and King Vulture.

**Landscape Context**

The National Park lies on the Hummingbird Highway, in the limestone foothills of the Maya Mountains Massif, some 2.4km north of the Sibun Forest Reserve. Biological connectivity still remains within the Massif via largely undisturbed forest cover. The primary economic activity within the area is agriculture, focused on citrus farming, utilizing the rich alluvial soils of the river valleys. In the immediate landscape, there is a combination of large citrus plantations in the Caves Branch area, and a patchwork of smaller holdings around Ringtail (the nearest community), that follow the road through the valley. Armenia Village, the largest community settlement closely buffering St. Herman’s Blue Hole National Park, is located just 4 miles to the north, and is more focused on employment opportunities within the Caves Branch Area and Belmopan City, located approximately 12 miles north of the National Park.

**History of Establishment**

The Blue Hole has been a popular recreational destination in Belize for many years, for both swimming and bird watching. As early as 1965, the nearby St. Herman’s Cave was also recognized as a potential tourism venue, leading to the Government of Belize acquiring a portion of the site in the early 1960’s, and the remainder in the 1970’s. It was finally declared a National Park in 1986, for the “protection and preservation of natural and scenic values of national significance for the benefit and enjoyment of the general public.” The protected area was established as the ‘Blue Hole National Park’, but was later changed in 2005 to ‘St. Herman’s Blue Hole National Park’, to avoid confusion with the ‘Blue Hole Natural Monument’, a part of the marine protected areas system.

**Management Regime**

In keeping with its designation as a National Park, St. Herman’s Blue Hole is a completely non-extractive protected area, with the management goal to conserve natural and cultural resources for ecosystem values, education, and recreation through collaboration with relevant stakeholders (Belize Audubon Society, 2010). Legislative responsibility for the National Park is held by the Forest Department, and the area is managed through a collaborative partnership with the Belize Audubon Society (BAS).
Natural Monuments

Victoria Peak Natural Monument
Photo: Dirk Francisco / Belize Audubon Society
Natural Monuments

For the protection and preservation of national features of national significance

The Natural Monument categorization is used for significant cultural landmarks – the Victoria Peak, Thousand Foot Falls, and the Blue Hole, for example.

Of the five Natural Monuments under the National Protected Areas System, four are managed by Belize Audubon Society (BAS), the largest co-management organisation in Belize. One of these - Actun Tunichil Muknal – is currently the only Forest Department administered protected area to be managed in a 3-way partnership with the Institute of Archaeology and BAS. The fifth Natural Monument, Thousand Foot Falls, is managed directly by Forest Department, as part of the Mountain Pine Ridge Forest Reserve.

<table>
<thead>
<tr>
<th>Name</th>
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<th>Gazetted</th>
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<td>III</td>
<td>1998/47</td>
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</table>

¹ IoA: Institute of Archaeology
2010 - Directory of Protected Areas in Belize

Protected Areas of Belize: Natural Monuments

- Belize Cayes and Mainland
- Mexico / Guatemala
- Natural Monuments

Projection: UTM Zone 16N
Datum: NAD 1927 Central
Date: December 7, 2009
GIS: Adam Lloyd

Kilometers
0 10 20 30 40 50 60 70 80 90 100 110 120

USAID
The Nature Conservancy
OAK Foundation
APAMO
Wildlife Works Capital
Actun Tunichil Muknal Natural Monument encompasses one of the most impressive archaeological cave sites in Belize, and a popular tourism destination. Translated as “Cave of the Stone Sepulcher”, the cave was first discovered in 1989, and was originally part of the 6,741 acre Tapir Mountain Nature Reserve, situated in the limestone karst at the northern limits of the Maya Mountains. The 455 acre site was excised from Tapir Mountain in January 2004 (SI 16 of 2004) to allow access for tourism, and is managed in a collaborative partnership between Belize Audubon Society, Forest Department and the Institute of Archaeology.

The Natural Monument lies in an area of karstic limestone overlying Late Carboniferous Santa Rosa Group metasedimentary rock, in the foothills of the Maya Mountains Massif. The karstic nature of the limestone has led to cave formations – including perhaps the best known – Actun Tunichil Muknal. This cave system is approximately 5km long, and has a stream flowing through the major cave passage throughout the year, and contains spectacular cave formations – stalactites, stalagmites, rimstone dams and calcite pools.

Studies have shown that the Maya first visited the entrance to the cave during the Early Classic period (300 – 600AD), penetrating deeper into the system in the Late to Terminal Classic Period (700 – 900 AD). Their visits had a ceremonial purpose, and over 1,400 ceremonial and non-ceremonial artifacts have currently been documented, ranging from stone tools to ceramic vessels and stelae, as well as fourteen separate human skeletal remains, including the skeleton of the ‘Crystal Maiden’, now calcified by the natural processes of the cave.

Actun Tunichil Muknal Natural Monument encompasses 455 acres of lowland broad-leaved moist forest consisting of calcareous loving plant species assemblages. Globally threatened species protected by the forests of this Natural Monument and the contiguous Tapir Mountain Nature Reserve include the Yucatan black howler monkey and Baird’s tapir. Cave dwelling species, such as bats, freshwater cave crabs, shrimps and whip scorpions are also protected within the cave system.

**Biodiversity**

**Physical Features**

The Natural Monument lies in an area of karstic limestone overlying Late Carboniferous Santa Rosa Group metasedimentary rock, in the foothills of the Maya Mountains Massif. The karstic nature of the limestone has led to cave formations – including perhaps the best known – Actun Tunichil Muknal. This cave system is approximately 5km long, and has a stream flowing through the major cave passage throughout the year, and contains spectacular cave formations – stalactites, stalagmites, rimstone dams and calcite pools.

**Elevation:** 100m – 400m above sea level
**Geology:** Late Carboniferous Permian (Santa Rosa Group); Undifferentiated Cretaceous limestone
**Annual Rainfall Regime:** 80 - 100" (2032 - 2540mm)

Studies have shown that the Maya first visited the entrance to the cave during the Early Classic period (300 – 600AD), penetrating deeper into the system in the Late to Terminal Classic Period (700 – 900 AD). Their visits had a ceremonial purpose, and over 1,400 ceremonial and non-ceremonial artifacts have currently been documented, ranging from stone tools to ceramic vessels and stelae, as well as fourteen separate human skeletal remains, including the skeleton of the ‘Crystal Maiden’, now calcified by the natural processes of the cave.

**Species of International Concern**

**Endangered:**
- Yucatan Black Howler (Alouatta pigra)
- Baird’s Tapir (Tapirus bairdii)

**Vulnerable:**
- Spanish Cedar (Cedrela odorata)
- Keel-billed Motmot (Electron carinatum)
- Mahogany (Swietenia macrophylla)

*IUCN, 2010*
The Natural Monument is contiguous with the adjacent Tapir Mountain Nature Reserve, and these forests are currently still contiguous with those of the Maya Mountains Massif, one of the largest remaining blocks of forest in Central America, and important for the maintenance of biodiversity in Central America. The forested western slopes of Roaring Creek provide partial protection to this section of the water catchment area, part of the Belize River Valley watershed.

The cave systems, characteristic of the limestone karst foothills of the Maya Mountains, include the Actun Tunichil Muknal cave itself, an important focus for tourism in the Cayo District. Agricultural expansion in the area (fuelled primarily by Mennonites and Central American refugees) is increasing adjacent land use change, with increasing ease of access into the area and associated impacts of looting of smaller caves, illegal xate harvesting and hunting.

Actun Tunichil Muknal was originally part of a privately owned tract of 6,741 acres, purchased for wildlife protection in 1974, who donated it to the Government of Belize in 1975 for maintenance as a conservation area. It was then leased back to its original owners, to be managed as a protected area – Society Hall Nature Reserve. The Nature Reserve was officially gazetted in December 1986 (SI 108 of 1986), and in 1990 was transferred to BAS for management.

The 455 acre Actun Tunichil Muknal cave and surrounding area was excised in 2004 (SI 15 of 2004) as a Natural Monument, to allow visitation to the impressive cave system and Maya artifacts.

Belize Audubon Society has managed Actun Tunichil Muknal Natural Monument as part of Tapir Mountain Nature Reserve since 1990, in partnership with the Forest Department. With the separation of Actun Tunichil Muknal from the Nature Reserve, and with the importance of the archaeological site, management is now under a three-way agreement between the Belize Audubon Society, the Forest Department and the Institute of Archaeology.

Equivalent to the IUCN Category II designation, the area is managed primarily for its outstanding natural geological features – primarily the cave system (IUCN, 1994).
The spectacular Blue Hole Natural Monument is one of two marine protected areas on Lighthouse Reef Atoll, managed as a single unit under Belize Audubon Society. It is part of Belize’s World Heritage Site, in recognition of the unique geological features found within the circular sinkhole, and attracts divers from all over the world. Largely unexplored in terms of biodiversity, it is thought that it may protect unique cryptofaunal assemblages, with as yet unidentified species.

**Physical Features**

The Blue Hole Natural Monument, with its clear, shallow waters and scattered patch reefs, lies within the Lighthouse Reef Atoll platform, one of three Atolls in Belize, and the furthest from the mainland. The Blue Hole itself lies at the centre - almost perfectly circular, with a diameter of approximately 320m at the upper rim, and hourglass shape in cross section, and an estimated 124m deep, this underwater sinkhole, or cenote, tells a geological history of changes in sea level, and inundation cycles of both salt and freshwater (Jones et. al. 2000). It has impressive submerged caves and stalactite structures that draw visitors from around the world. It also has high scientific value as a huge sediment trap, providing data on past geological events that can be captured through sediment core analysis – rising and falling sea levels, hurricanes, and possibly providing evidence of long-term climate change, mercury and arsenic fluctuations and deposition from African dust clouds (US Geological Survey, 2001).

Coral has formed around the rim of the sinkhole itself, with two breaks, providing connectivity between the hole and the rest of the Atoll. Whilst the Natural Monument does not include the reef crest of the Atoll rim or the spur and groove formations of the outer Atoll, it does benefit from their sheltering presence.

**Biodiversity**

The shallow water seagrass, patch reef and reef rim of the collapsed cave system support abundant fish species, and as a no-take zone, contribute towards the conservation of commercial species such as conch and lobster (though the size of the protected area is small).
In the Blue Hole itself, the collapsed cave system appears to support a limited amount of marine life, with filamentous algae, sponges, cornflake algae and isolated gorgonians. Little biological work has been conducted here, and it has been highlighted for the potential of having unique assemblages of cryptic and endemic species (Kramer and Kramer, 2002), though this remains an unknown.

Between them, Half Moon Caye and Blue Hole Natural Monuments, managed as a single unit, provide protection for at least eighteen species of concern (rated as critically endangered, endangered or vulnerable), including the Critically Endangered staghorn and elkhorn corals, goliath grouper and hawksbill turtle. Lemon, reef, hammerhead and blacktip sharks have all been reported within the Blue Hole by visitors, from Cousteau to the more recent reports from diving expeditions and dive operators using the site today (Walker and Walker, 2006).

As a non-extractive marine protected area, the primary focus of use is tourism - Blue Hole and Half Moon Caye Natural Monuments are two of the most visited protected areas in Belize, with approximately 8,680 visitors in 2008 (BTB, 2009). The majority of visitors are divers, arriving daily on dive boats primarily from San Pedro, Caye Caulker, Belize City or Turneffe Caye, and the Natural Monument is an important contribution towards maintaining the tourism industry in these communities. On Lighthouse Reef Atoll, two of the five cayes (Northern Caye and Long Caye) have tourism developments, either planned or in the process of being constructed / renovated, which will increase visitation and visitation pressure on the Blue Hole, as well as increase the potential for environmental impacts associated with development.

Whilst not permitted within the protected area, fishing does have an impact on the viability of marine species of the Natural Monument. The majority of the Lighthouse Reef fishermen originate from the three northern Mestizo

**Landscape Context**

As a non-extractive marine protected area, the primary focus of use is tourism - Blue Hole and Half Moon Caye Natural Monuments are two of the most visited protected areas in Belize, with approximately 8,680 visitors in 2008 (BTB, 2009). The majority of visitors are divers, arriving daily on dive boats primarily from San Pedro, Caye Caulker, Belize City or Turneffe Caye, and the Natural Monument is an important contribution towards maintaining the tourism industry in these communities. On Lighthouse Reef Atoll, two of the five cayes (Northern Caye and Long Caye) have tourism developments, either planned or in the process of being constructed / renovated, which will increase visitation and visitation pressure on the Blue Hole, as well as increase the potential for environmental impacts associated with development.

Whilst not permitted within the protected area, fishing does have an impact on the viability of marine species of the Natural Monument. The majority of the Lighthouse Reef fishermen originate from the three northern Mestizo

**Conservation Targets**

- Commercial Marine Species
- Coral reef
- Sharks
- Parrotfish
- Seagrass

**Key Conservation Threats**

- Illegal spear fishing within the Natural Monument
- Unsustainable fishing within Atoll
- Diving and snorkelling
- Recreational boat impacts (anchors, groundings)
communities of Copper Bank, Sarteneja and Chunox, with a small number of fishermen from Belize City. These fishermen free-dive primarily for spiny lobster (*Panulirus argus*) and queen conch (*Strombus gigas*), both of which have declined since the early 1980’s, when the industry was at its peak.

The Atoll lies close to the international shipping lane, with an ever-increasing flow of cargo and passenger vessels, from oil tankers to cruise ships, passing directly to the east. With this comes concern of the risks of groundings on the Atoll, and the implications to the health of the reef and viability of marine life in this relatively pristine reef system.

**History of Establishment**

The 1,023 acre Natural Monument is a national protected area, designated as a Natural Monument in 1996 (SI 96 of 1996), under the National Parks System Act administered under the Forest Department, to protect the geological formations found within the sinkhole. It was designated by UNESCO in 1996 as one of seven protected areas that combine to form the Belize Barrier Reef Reserve System – World Heritage Site.

**Management Regime**

It is managed jointly with the Half Moon Caye Natural Monument, with legislative responsibility for both being held by the Forest Department, and site management by the Belize Audubon Society (BAS). BAS is responsible for day-to-day management of the two Natural Monuments, including activities such as patrols, visitor management and fee collection, and scientific monitoring.

As a Natural Monument, the Blue Hole does not allow for extractive use, and is managed with the goal of protecting and preserving “natural resources and nationally significant natural features of special interest or unique characteristics to provide opportunities for interpretation, education, research and public appreciation for the benefit of current and future generations, within a functional conservation area” (National Parks System Act, 1982).

The equivalent IUCN management category, Category III, is defined as a ‘protected area managed mainly for conservation of specific natural features’ – in this case, the Blue Hole.

**SITE INFORMATION**

- **Size:** 1,023 acres (414 ha)
- **Statutory Instrument:** SI 96 of 1996
- **IUCN Category:** III
- **Management Authority:** Forest Department
- **Co-management Partner:** Belize Audubon Society (BAS)
- **Contact E-mail:** base@btl.net
- **Web site:** www.belizeaudubon.org

**Location:** Blue Hole Natural Monument lies on the platform of Lighthouse Reef Atoll, the most easterly of Belize’s three Atolls

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

**Management Plan:** 2008 - 2013

**Biodiversity Information:** First explored by Jacques Cousteau in 1971; US Geological Survey assessment of sediment cores (2001); Rapid Assessment in 2006 (R. Graham). Individual researchers

**Facilities (2009):** None. Supported by Half Moon Caye facilities

**Visitation (2008):** 8,680 visitors

**On-site Staff (2009):** 4 rangers, 1 coxswain, 1 biologist (covering Half Moon Caye Natural Monument as well), supported by technical and administrative staff in the BAS office in Belize City
Half Moon Caye Natural Monument lies on Lighthouse Reef Atoll, the furthest of the Atolls from the coast of Belize. The protected area consists of both terrestrial and marine components, and is centred on Half Moon Caye, with its littoral forest and impressive bird nesting colony. It also encompasses representative examples of the marine ecosystems in the surrounding waters. This includes a portion of the edge of the atoll, a reef wall dropping to over 3,000 feet, drawing many visitors to the area. With limited anthropogenic impacts, this, together with the shallow patch reefs and seagrass beds, harbours a diverse variety of marine life considered to be some of the most pristine in Belize, and even the region.

Half Moon Caye Natural Monument has been recognized by UNESCO as one of seven protected areas that combine to form the Belize Barrier Reef Reserve System – Belize’s World Heritage Site, and is managed by Belize Audubon Society (BAS), as a single unit with the adjacent Blue Hole Natural Monument.

**Physical Features**

The Natural Monument encompasses only a small portion of the Lighthouse Reef Atoll, which sits on the third and most easterly of three tilted submarine escarpments, on a base of metamorphic rock. The carbonate reef platform of the Atoll is thought to have formed during the last interglacial era.

The Natural Monument includes Half Moon Caye, the largest of five sandy cayes within the atoll lagoon, and the only one with protected status. A portion of the east and south facing reef walls are also included, with water depth increasing rapidly from the shallow waters of the inner atoll lagoon to between 500 and 1000 m beyond the reef wall.

**Biodiversity**

Half Moon Caye Natural Monument is important as both a component of Belize’s marine protected areas system, and also of regional and international marine systems. Half Moon Caye

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**SPECIES OF INTERNATIONAL CONCERN**

- **Critically Endangered**
  - Staghorn Coral: Acropora cervicornis
  - Elkhorn Coral: Acropora palmata
  - Hawksbill Turtle: Eretmochelys imbricata
  - Goliath Grouper: Epinephelus itajara

- **Endangered**
  - Loggerhead Turtle: Caretta caretta
  - Green Turtle: Chelonia mydas
  - Nassau Grouper: Epinephelus striatus
  - Great Hammerhead: Sphyrna mokarran
  - Fire Coral: Millepora sp.
  - Star Coral: Montastraea annularis
  - Star Coral: Montastraea faveolata

- **Vulnerable**
  - Rainbow Parrotfish: Scarus guacamaia
  - Queen Triggerfish: Balistes vetula
  - Hogfish: Lachnolaimus maximus
  - Yellow-mouth Grouper: Myctoperca interstitials
  - Cubera Snapper: Lutjanus cyanopterus
  - Mutton Snapper: Lutjanus analis
  - White-lined Toadfish: Sanopus greenfieldorum
  - Whale Shark: Rhincodon typus

Walker, 2009
and Blue Hole Natural Monuments provide protection for at least twenty species of concern (rated as critically endangered, endangered or vulnerable), including the Critically Endangered goliath grouper and hawksbill turtle.

The Natural Monument consists of both terrestrial and marine components. The eastern section of Half Moon Caye is more or less cleared of natural vegetation, supporting a low density coconut plantation that is maintained for visitor appreciation. The south-east facing beach is important for sea turtles - loggerhead, green and hawksbill turtles have all been recorded nesting here. The western portion of the island has littoral forest supporting what is thought to be the only viable breeding colony of white-phase red-footed boobies in the western Caribbean (L. Jones, pers. com.). Littoral forest, recognized as perhaps the most threatened ecosystem in Belize within the (National Protected Areas System Plan, 1995) and the most under-represented (Meerman, 2005) provides not only nesting sites for the red-footed booby and magnificent frigatebird colony, but also an important waypoint for migratory birds – particularly warblers. Additionally it is an important habitat for the island leaf-toed gecko (endemic to the Belize cayes) and Allison’s anole, two lizard species of special interest because of their very restricted distributions.

The marine component includes a portion of the edge of the atoll, a reef wall that is recognized as one of Belize best dive sites, with immaculate reefs and diverse marine life. The deeper waters in the south of the protected area provide the conditions required for a regionally important spawning aggregation site.

**Landscape Context**

There are no communities in or adjacent to the boundaries of Half Moon Caye Natural Monument, but the protected area never the less is situated within a complex socio-economic context, with several coastal communities reliant on its marine resources, primarily as a tourism destination. Live-aboards and day dive boats from San Pedro, Caye Caulker, Turneffe and Belize City contribute towards the tourism-based stakeholder interests in the Natural Monument.

An equally important economic activity associated with the larger Lighthouse Reef is fishing, primarily for lobster, conch and fin-fish, with fishermen originating from the northern fishing communities – particularly Chunox and Copper Bank. Fishing incursions within, and over-fishing of marine resources outside the Natural Monument, have impacts on the viability of the commercial species.

**History of Establishment**

The first protected area in Belize, and the first marine protected area in Central America, Half Moon Caye Natural Monument was initially established as a crown reserve in 1928 to protect the large nesting colony of white-phase red-footed boobies and magnificent frigatebirds. It was then extended to include a marine component in 1982, with representative ecosystems in the adjacent marine environment, including reef wall, patch reefs and seagrass.
Half Moon Caye Natural Monument is non-extractive, with the goal of protecting and preserving “natural resources and nationally significant natural features of special interest or unique characteristics to provide opportunities for interpretation, education, research and public appreciation for the benefit of current and future generations.” (National Parks System Act, 1982).

It is managed jointly with the Blue Hole Natural Monument, with legislative responsibility for both being held by the Forest Department, and on-site management by the Belize Audubon Society, through a collaborative partnership.

The island leaf-toed gecko (*Phyllodactylus insularis*)

The nocturnal island leaf-toed gecko is Belize’s only endemic reptile, and is considered relatively abundant on Half Moon Caye. Its known range in Belize is extending as further surveys are conducted on more islands - to date in addition to the population on Half Moon Caye, it has also been recorded on Long Caye, Middle Caye and Twin Cayes on Glovers Reef Atoll, and recently from several cayes off the coast of southern Belize (Crawl Caye, False Caye, Lagoon Caye, Peter Douglas Caye and West Snake Caye) (Boback, S.M., 2005). With its limited range, restricted to low-lying cayes, this species is particularly vulnerable to hurricane and development impacts, and to the potential impacts from introduced species.
Thousand Foot Falls Natural Monument

The 1,290 acres of the Thousand Foot Falls Natural Monument lies in the northern foothills of the Maya Mountains Massif. Whilst called the Thousand Foot Falls, the waterfall actually plunges 1,600 feet from the Maya Mountains escarpment down into the steep-sided, forest-cloaked river valley of Roaring Creek.

Considered as much a part of Belize’s cultural heritage as Victoria Peak and the Blue Hole, the Thousand Foot Falls is not only the highest waterfall in Belize, but is thought to also be the highest in the region.

Physical Features

The Thousand Foot Falls lies at the junction of the metasedimentary escarpment of the Maya Mountains Massif, and the deeply incised limestone foothills – the last remnants of the capping limestone that once covered the area. Approximately 1,600 feet, the Thousand Foot Falls is part of the Roaring Creek, which flows over a major geological fault line from the Maya Mountains escarpment, before joining the Belize River further downstream.

Biodiversity

Four broad terrestrial ecosystems have been identified within the Thousand Foot Falls Natural Monument, ranging from submontane pine forest on the sandy soils of the granite plateau to lowland forest in the sharply incised limestone soils of the river valleys.

A number of plant species endemic to Belize have been recorded within the protected area, including *Dalecempia schippii* and *Schippia concolor* (Walker et al., 2007)

The orange-breasted falcon (*Falco deiroleucus*) is highlighted as vulnerable in the Central American portion of its range (Peregrine Fund), and very rare, perhaps extinct, south of Belize and Petén, Guatemala (Jones and Vallety, 2001; The Peregrine Fund, 2005). It is known to nest in only a few areas in Belize, one of these being the Thousand Foot Falls (Jones and Vallety, 2001), and it’s almost guaranteed presence attracts visitation from national and international birding groups. The site is also popular for the opportunity to see other bird species of note – for example, the king vulture, white collared swift, golden headed tanager, and stygian owl, many of which are restricted to the Mountain Pine Ridge areas of the Maya Mountains Massif.
**Landscape Context**

Thousand Foot Falls Natural Monument is managed as a single unit with the Mountain Pine Ridge Forest Reserve, as part of the system-level management unit – the Maya Mountains Massif system.

Whilst the boundaries are not contiguous with that of the main Maya Mountain Massif block, the forest is linked through the privately owned Hidden Valley Falls property, a private protected area not yet incorporated into the national protected areas system. As such, it adds to the size of the Maya Mountains Massif, and the protection of a representative portion of the valley systems that exist on the northern slopes of the Massif.

It is an integral component of the watershed protection provided by the Maya Mountains Massif, protecting the upper watershed of the Roaring Creek, a tributary of the Belize River, as it leaves the Massif.

**History of Establishment**

The Thousand Foot Falls, considered part of Belize’s national heritage, was excised from the surrounding private protected area of the Hidden Valley estate and designated as a Natural Monument in 2004, to provide public access.

**Management Regime**

Thousand Foot Falls is managed directly under the Forest Department, as a single unit with the Mountain Pine Ridge. As a Natural Monument, it is non-extractive, with permitted activities including only tourism, education and research.

Equivalent to the IUCN Category III designation, the area is managed primarily for conservation of specific natural features – in this case, the 1,600 foot waterfall that plunges over the Maya Mountains escarpment.

**The Maya Mountains Massif**

The Maya Mountains Massif is a system-level management unit composed of 14 protected areas that together make up one of the most important remaining intact forest areas in Central America.

Encompassing the majority of the upper watersheds in Belize, the Maya Mountains Massif provides watershed protection and water security for communities in south and central Belize, including Belize City. It also provides a ‘Noah’s Ark’ for many forest species of Central America, including the jaguar, tapir and howler monkey, along with endangered amphibian species that are in sharp decline elsewhere in the region.
The 4,847 acres of the Victoria Peak Natural Monument lies within the Maya Mountains – a landscape of ridge crests, rolling hills and river flood plains, cloaked in tropical broadleaf evergreen forest. The protected area encompasses the Cockscomb Ridge, a series of peaks that form the northern-most wall of the Cockscomb Basins, and dominate the landscape – a well known landmark within Belize.

**Physical Features**

The Cockscomb range runs west to east, forming the central ‘spine’ of this Natural Monument, and is composed of steep sided ridges of granite in the lower foothills and exposed quartzite and fine grained sandstone in the highest areas (Meerman et. al. 2001). It also forms the northern portion of the upper watershed of both the South Stann Creek and Monkey River (through the Swasey drainage area), which flow eastwards towards the coastal plain. To the north, the mountain range forms the upper watershed of the Sittee River system.

The highest point is Victoria Peak itself, at 3,675 feet (1,120m), flanked on both sides by lower peaks – Mount Allan and Mount Escott to the west, and Mount Holland, Jerningham Peak and The Molar to the east.

**Biodiversity**

A total of 5 terrestrial ecosystems have been identified within Victoria Peak Natural Monument, including one of the few tracts of lower montane Elfin Woodland (both Elfin Woodland and Elfin Shrubland), an ecosystem with a very limited distribution in Belize.

Victoria Peak Natural Monument, as an integral component of the Cockscomb area, is home to a very significant percentage of the species found in Belize. Over 58% of Belize’s mammals, 56% of its birds and 69% of its amphibians have been recorded as present to date (and expected to increase following recent surveys). It is also particularly important for the protection of upper elevation species, including threatened amphibians, keel billed mot mots and orchids.

With reportedly very high hunting pressure on game species throughout the adjacent forest reserves and on the coastal plain, Victoria Peak Natural Monument and Cockscomb Basin Wildlife Sanctuary, as a single management unit, and as part of the Maya Mountains Massif, remains a critical stronghold for many game species.
Landscape Context

Victoria Peak Natural Monument, managed as a single unit with Cockscomb Basin Wildlife Sanctuary, is a core component of the Maya Mountains Massif, one of the few remaining large, contiguous forested blocks in Central America, and considered critical in the long term viability of forest species in the region. As an integral component of the watershed protection provided by Cockscomb Basin Wildlife Sanctuary, it contributes towards providing a measure of water security and reducing the risk of flash floods for the agricultural areas and communities of the coastal plain. The protected watersheds also help maintain the water clarity of rivers flowing to the Caribbean Sea, essential for the health of the Belize Barrier Reef.

Citrus, banana, cattle and shrimp are the major, large-scale agricultural industries within the immediate vicinity of Cockscomb, dominating not only the land use patterns adjacent to the Sanctuary, but also the economy of the area. These provide employment for the ten stakeholder communities that have been identified within the immediate Victoria Peak / Cockscomb landscape, with Maya Centre and Maya Mopan most closely linked to the protected area. A further three communities (Dangriga, Hopkins and Placencia) benefit from the attraction of Cockscomb as a tourism destination, offering visitors a chance to experience the tropical forest and its wildlife.

Whilst the Victoria Peak Natural Monument is not considered to have any major anthropogenic threats at this time, it does have a number of less severe threats and impacting factors, including pesticide contamination and visitor impacts that need to be addressed.

History of Establishment

Originally considered the highest point in Belize, Victoria Peak itself is well known throughout Belize as a cultural landmark. The formation of the national protected area was originally proposed in 1968, then again by FAO in 1978, supported by the Belize Audubon Society, resulting in Victoria Peak Natural Monument being established in 1998 as a Natural Monument, in recognition of its value as part of Belize's national heritage.

Management Regime

As a Natural Monument, Victoria Peak is a non extractive protected area, with the management goal of protecting and preserving natural resources and nationally significant natural features...for the benefit of current and future generations...” (National Parks System Act, 1982). It is managed jointly with the adjacent Cockscomb Basin Wildlife Sanctuary, with legislative responsibility for both being held by the Forest Department. BAS is responsible for day-to-day management of the two protected areas.

SITE INFORMATION

Size: 4,841 acres (1,959 ha)
IUCN Category: III
Management Authority: Forest Department
Co-management Partner:
  Belize Audubon Society (BAS)
Contact E-mail: base@btl.net
Web site: www.belizeaudubon.org

Location: Victoria Peak Natural Monument is part of the heavily incised east facing slope of the Maya Mountains Massif plateau, and lies adjacent to Cockscomb Basin Wildlife Sanctuary, and accessed through Maya Centre.

Uses: Non-extractive – tourism, education and research
Biodiversity Information: Rapid Assessment (Meerman et. al., 2001). Amphibian research (Walker), Independent researchers
Facilities (2009): Camp sites at 12 and 19km on the Victoria Peak trail; supported by facilities of Cockscomb Basin Wildlife Sanctuary
Visitation (2008): No data
On-site Staff (2009): Managed with Cockscomb Basin Wildlife Sanctuary, which has 1 site manager and 7 rangers
Nature Reserve

Bladen Nature Reserve
Photo: Paul Walker, Wildtracks
Nature Reserves

For the protection of biological communities or species, and the maintenance of natural processes in an undisturbed state

The three Nature Reserves have the strictest designation of all categories within the Belize National Protected Areas System, with no extractive use or tourism access permitted. Two of the Nature Reserves are under co-management agreements – one with Belize Audubon Society (Tapir Mountain), and one, Bladen, with Ya’axché Conservation Trust. The third, Burdon Canal, currently has no co-management partner, and is considered a paper park.

<table>
<thead>
<tr>
<th>Name</th>
<th>IUCN Category</th>
<th>Gazetted</th>
<th>Management / Co-Management Partner</th>
<th>Acres</th>
</tr>
</thead>
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<tr>
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<td>1990/66</td>
<td>Ya’axché Conservation Trust</td>
<td>99,674</td>
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<tr>
<td>Burdon Canal</td>
<td>Ia</td>
<td>1992/88</td>
<td>Forest Department</td>
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<td>Tapir Mountain</td>
<td>Ia</td>
<td>2004/15</td>
<td>Belize Audubon Society</td>
<td>6,300</td>
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</tbody>
</table>
2010 - Directory of Protected Areas in Belize

Protected Areas of Belize: Nature Reserves

- Burdon Canal NR
- Tapir Mountain NR
- Bladen NR

Projection: UTM Zone 16N
Datum: NAD 1927 Central
Date: December 7, 2009
GIS: Adam Lloyd

Kilometers
Bladen Nature Reserve, straddling the Bladen Branch River south-east of the Main Divide of the Maya Mountains, is considered to include some of Belize’s most pristine and biodiverse forests. Surrounded on almost all sides by mountainous ridges, the forests of Bladen have been largely protected from hurricane impacts. Past logging activities have been limited by the rugged terrain, and ended several decades ago, and the area is considered to include some of the oldest forest growth in Belize.

**Physical Features**

Bladen Nature Reserve is part of the Maya Mountains Massif, and encompasses two geomorphological areas - the granite / volcanic slopes rising to the crest of the Main Divide to the north and north west, and the limestone karst to the south, both draining into the central flat, alluvial plain of the Bladen Branch itself. Elevation ranges from 40m up to 1,124m at Doyle’s Delight – Belize’s highest point on the ridge of the Main Divide. Numerous streams have formed a series of steep-sided valleys leading from the Main Divide down to the Bladen River. To the north east is an intrusion of porphyritic Bladen volcanic rocks. To the east and south east there lies a rugged limestone topography of steep, conical hills pocked by vertical-sided sinkholes, underground streams and caves. Water is scarce in this karst landscape, especially during the dry months, resulting in vegetation that is adapted to seasonally drier conditions, with streams often disappearing underground in the dry season to re-appear further downstream, and a seasonal migration of wildlife to the lowlands, where water is more available. Only the Bladen flows permanently throughout the year.

**Biodiversity**

With its diversity of altitude, geology, aspect and hydrology, Bladen Nature Reserve offers one of the most diverse range of conditions for plant-life of any protected area in Belize, with an exceptionally diverse flora (Brewer, S. 2002), within some of the most pristine forest ecosystems in Belize. Lying within the Core Preservation Zone of the Maya Mountains Massif, it contributes towards the maintenance of the matrix of tropical broadleaf forests that are characteristic of northern Mesoamerica. The submontane forests of Bladen and the contiguous Columbia River Forest Reserve are unique in Belize and have been highlighted as a key biodiversity area, the highest priority for biodiversity conservation in Belize (Meerman 2009).

The eastern limestone hills that separate Bladen from the coastal plain provide protection from many of the destructive storms that hit the Caribbean coastline, resulting in a forest that has a little-disturbed structure, with tall trees of impressive stature, and intact ecological systems.

Bladen harbours a total of twenty ecosystem types, ranging from broadleaf lowland hill forest to submontane forest, riparian shrubland and short grass savanna (Meerman, 2004), providing protection for at least 19 species of international concern - including the critically endangered Morelet’s treefrog (Agalychnis moreleti). The forests of Bladen are the only known area where harpy eagle nesting behaviour has been recorded in

<table>
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<tr>
<th>SPECIES OF INTERNATIONAL CONCERN</th>
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<tr>
<td><strong>Critically Endangered</strong></td>
</tr>
<tr>
<td>Morelet’s Treefrog</td>
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<tr>
<td><strong>Endangered:</strong></td>
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<tr>
<td>Yucatan Black Howler</td>
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<td>Geoffroy’s Spider Monkey</td>
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<td>O’Donnell’s Salamander</td>
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<tr>
<td>Sabrinus Rain Frog</td>
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<tr>
<td>Sanderson’s Treefrog</td>
</tr>
<tr>
<td>Fringed-limbed Treefrog</td>
</tr>
<tr>
<td>Baird’s Tapir</td>
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<tr>
<td><strong>Vulnerable</strong></td>
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<td>Wooly Opossum</td>
</tr>
<tr>
<td>Keel-billed Motmot</td>
</tr>
<tr>
<td>Limestone Rainfrog</td>
</tr>
<tr>
<td>Mahogany</td>
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</tbody>
</table>
recent years (BFREE, 2009) – indicative of the maturity of the forests and lack of disturbance, as is the presence of the scarlet macaw, a species of national concern. The wet forests of western Bladen and the contiguous north-west plateau of Columbia River Forest Reserve harbour the most diverse amphibian fauna in Belize with the high probability of several species being new to science (Walker, pers. obs., 2010).

**Landscape Context**

Bladen Nature Reserve provides a number of critical landscape functions at both national and regional level, as part of the Maya Mountains Massif, one of the largest remaining contiguous blocks of forest in Central America. Ranked as part of the highest priority area in the Key Biodiversity Areas assessment, with western Cockscomb, southern Chiquibul and north-western Columbia River (Meerman, 2009), Bladen plays a central role in the conservation of Belize’s biodiversity and meeting Belize’s international commitments towards global biodiversity goals. Encompassing the steep slopes of the upper Bladen water catchment, one of the tributaries of the Monkey River watershed (the largest watershed contained entirely in southern Belize), it also plays a critical role in maintaining watershed functionality for the communities and agricultural industries downstream on the coastal plain – particularly the cattle, banana and citrus industries.

The rugged terrain has also deterred extensive hunting incursions, as has the presence of other protected areas to all sides, though Guatemalan xateros are known to access parts of Bladen via the adjacent Columbia River Forest Reserve. However, recent expansions of communities and associated agricultural lands east of Bladen, in the Trio area, have facilitated access, and increased the threat of hunting incursions, as has the opening of old hunting trails from Bladen, Medina Bank and Golden Stream.

As a Nature Reserve, Belize’s highest level of legal protection, Bladen can only be accessed for research and education, and is therefore limited in the socio-economic benefits it can offer to buffer communities. The integrity of the Nature Reserve and the ecosystem functions it provides to adjacent communities is currently threatened by the consideration of hydro-electricity development of the Central River in the west of the reserve.

**History of Establishment**

Bladen Nature Reserve was established in 1990 (SI 166 of 1990), following field expeditions indicating its very high biodiversity and the near-pristine condition of its forests (Weyer, 1981; Brokaw et. al., 1987; Johnson, 1989).

**Management Regime**

Bladen is designated as a Nature Reserve, and as such, has the most restrictive of categories possible under the National Parks System Act, allowing only education and research activities. Legislated management authority lies with the Forest Department, with a co-management agreement with the Ya’axché Conservation Trust, which is responsible for on-site management of the reserve.
Burdon Canal Nature Reserve

Burdon Canal Nature Reserve is located in a wetland area immediately west of Belize City, centered on Faber’s Lagoon — a large, brackish lagoon and associated canal system, and provides a tourism venue rich in birdlife. The south-eastern boundary follows the Bladen Canal, linking Northern Lagoon with Belize City. Despite its status as a Nature Reserve, the highest degree of protection available, the lack of on-site management has led to increasing allocation of lands within the protected area, and a recent realignment of the boundaries.

Physical Features

The Nature Reserve is situated on the coastal plain, in the Belize River / Haulover Creek delta. Much of this low-lying basin is permanently waterlogged, either from riverine or tidal inundation, though the land is slightly drier and higher to the west, on the sandy soils of the coastal plain.

The Burdon Canal itself, which forms the eastern boundary of the Nature Reserve, was constructed in 1920, in response to large estates on Northern and Southern Lagoons and Manatee River seeking an easier means of transporting logs and crops to Belize City.

Biodiversity

The vegetation of the Nature Reserve is predominantly red mangrove, with basin, riverine and mixed mangrove scrub ecosystems all represented. Away from the more saline inundation areas, the mangrove gives way to herbaceous swamps, fed by the fresh waters of the Belize River. The higher land to the east supports vegetation on poor sandy soils – lowland forest and broadleaved lowland shrubland. The area is important for wetland birds – particularly herons and egrets, and for Morelet’s crocodiles.

Landscape Context

Burdon Canal Nature Reserve is situated adjacent to Belize City, the largest population centre in Belize, with an estimated 76,000 residents. Its proximity to Belize City, and the appeal of water front property, has led to a number of incursions into the protected area, with mangrove clearance and filling, and lease allocations by Lands Department, resulting in a realignment of the boundary in 2010. This pressure for land is predicted to increase in the future, as Belize City expands outwards, along the Western Highway.
The Burdon Canal itself still acts as an important connection for the people of Gales Point, who use it to access Belize City by boat. It is also used by people from Belize City to access Northern and Southern Lagoon for recreation and sport fishing, as well as a tourism resource.

**History of Establishment**

In 1953, the Crown Lands associated with Faber’s Lagoon were designated as a game reserve – the Faber’s Lagoon Bird Sanctuary, to protect the wildlife and mangroves adjacent to Belize City. Following recommendation from the Coastal Zone Management Unit (later the Coastal Zone Management Authority and Institute), this was further strengthened through its designation as a Nature Reserve in 1992, following the increasingly rapid clearance of mangroves, and the leasing of lands within the protected area. Under SI 46 of 2010, 390 acres were excised from the Reserve, including these leased properties.

**Management Regime**

Burdon Canal Nature Reserve is managed directly by the Forest Department, though with no on-site presence. Designated as a Nature Reserve, activities should be highly regulated, with access for only research and education purposes, however in reality, the area is accessed for tourism, fishing and recreation.

**SITE INFORMATION**

- **Size**: 4,865 acres (1,969 hectares)
- **Statutory Instrument**: SI 46 of 2010
- **Original SI**: SI 88 of 1992
- **IUCN Category**: Ia
- **Management Authority**: Forest Department
- **Contact E-mail**: fdsecretary@mnrei.gov.bz
- **Location**: Burdon Canal Nature Reserve lies just west of Belize City
- **Uses**: Non extractive – research and education only
- **Management Plan**: None
- **Biodiversity Information**: Limited. A rapid biodiversity assessment was completed in 1993 (Miller et. al.)
- **Facilities (2009)**: None
- **Visitation (2009)**: No data.
- **On-site Staff (2009)**: None

**The Mangroves of Belize**

The predominant vegetation of Burdon Creek Nature Reserve is mangrove. Mangroves are well-known for their protective functions, mitigating the destructive forces of hurricanes and other natural disasters in coastal areas. Mangroves also play a crucial role in the ecology of estuaries, coral reefs and other marine ecosystems, producing and trapping concentrations or organic matter which are used by marine organisms in coastal food webs. The ability of mangrove roots to filter water before it enters the sea is important in preventing contaminants and sediment from reaching the more fragile coral reef.

Many of Belize’s commercial marine species, including fish and lobster, depend upon the nursery functions of mangrove communities, the roots of the red mangrove providing shelter from predators.

In recognition of their importance and the environmental services they provide, mangroves are protected under Belize legislation, and mangrove clearance is only allowed with permission from the Forest Department.
Tapir Mountain Nature Reserve is located in Cayo District, in the limestone karst at the northern limits of the Maya Mountains. It is considered an important representation of this system (Zisman, 1996), particularly as other protected areas in these northern foothills become increasingly eroded by dereservation, and forest cover in adjacent lands is being cleared for agricultural expansion.

Physical Features

The Nature Reserve encompasses the rugged karstic limestone overlying Santa Rosa Group Late Carboniferous Permian rock in the northern foothills of the Maya Mountains Massif. The area contributes towards watershed protection for several communities (Teakettle, Blackman Eddy, Ontario, Barton Creek and Georgeville), and two major tributaries of the Belize River, Barton Creek and Roaring Creek, form the eastern and western boundaries respectively. The limestone topography has numerous associated sinkholes, as well as caves, many of which contain Maya artifacts.

Biodiversity

Tapir Mountain Nature Reserve encompasses 6,286 acres of lowland broad-leaved moist forest of four calcareous loving species assemblages, and has been highlighted in the past for its status as a ‘mahogany rich forest’, with estimated densities of one to two mahogany (Swietenia macrophylla) per acre within the broadleaf forest ecosystems (Smith, 1996). The Nature Reserve sustains a diverse flora and fauna. It is important as a wintering habitat for migratory bird species, and is thought to harbour representative populations of the game species found in healthy forests in Belize, including the collared and white-lipped peccary, paca and armadillo (however, recent reports of extensive xatero activity within the protected area have altered some species abundance and distributions, as has been seen elsewhere in the Maya Mountain Massif).

Internationally threatened species protected by this conservation area include the Yucatan black howler monkey (Alouatta pigra) and Baird’s tapir (Tapirus bairdii), recorded during the biological assessment of the area (Miller & Miller, 1994; Meerman & Boomsma, 1994). Several more species of concern can be expected to be added to the species list in the future as more comprehensive surveys are conducted on the biodiversity of the area.

Landscape Context

The forest of the Tapir Mountain Nature Reserve is contiguous with that of the Maya Mountains Massif, one of the largest remaining blocks of forest in Central America, and important for the maintenance of biodiversity in the region.
As a Nature Reserve, Belize’s highest level of legal protection, Tapir Mountain can only be accessed for research / monitoring and education, and is therefore limited in the economic benefits it can offer to buffer communities. The integrity of the Nature Reserve and the ecosystem functions provide critical environmental service to adjacent communities downstream, maintaining water quality and security.

To the north of Tapir Mountain Nature Reserve are several communities, ranged along the Western Highway, the closest being Blackman Eddy Village. East of the Reserve along the banks of Roaring Creek is a settlement Roaring River and to the west are conservative Mennonite settlements, Upper Barton Creek and Lower Barton Creek northwest of the Reserve. To the south are rugged forested lands owned by the Government of Belize and C Investor’s Limited.

### History of Establishment

The 6,286 acres (2,543 ha) was part of a total area of 7,091 acres, purchased privately for wildlife protection in 1974. In 1975, 6,741 acres was donated to the Government of Belize, and then leased back to the original owners, to be managed as a protected area - Society Hall Nature Reserve. It was officially gazetted in December 1986 (SI 108 of 1986), and in 1990, the land was transferred to Belize Audubon Society as a 99 year lease, back-dated to 1975. In 1994, the name ‘Society Hall Nature Reserve’ was replaced by ‘Tapir Mountain Nature Reserve’ partly

In 2004, 455 acres was separated as a Natural Monument to allow for visitation to the impressive cave system and Maya artifacts of Actun Tunichil Muknal Natural Monument (SI15 of 2004) co-managed by Belize Audubon Society, Forest Department and the Institute of Archaeology.

### Management Regime

Tapir Mountain Nature Reserve is managed with the goal of retaining “in perpetuity a portion of the northern Maya Mountain foot-hills ecosystem to provide opportunities for scientific studies and to protect the area’s biodiversity, through community development programmes.” Under the current legislation, there are strict restrictions on activities that can take place within the area. As a Nature Reserve, only research and educational activities are permitted, with no extractive use (sustainable or otherwise) allowed.

It is one of nine national protected areas managed through a co-management agreement between the Government of Belize and Belize Audubon Society, a non-governmental membership organisation dedicated to the sustainable management of Belize’s natural resources. Belize Audubon Society has managed the Nature Reserve since 1990, and is responsible for the day-to-day management and maintenance of the parks.
Wildlife Sanctuaries

Cockscomb Basin Wildlife Sanctuary
Photo: Zoe Walker, Wildtracks
Wildlife Sanctuaries

For the protection of nationally significant species, biotic communities or physical features

There are seven Wildlife Sanctuaries within the protected areas system, three of which are being managed under co-management agreements (current or lapsed), whilst the other four have organisations seeking co-management, with informal arrangements with Forest Department.

Two Wildlife Sanctuaries – Corozal Bay and Swallow Caye Wildlife Sanctuaries - are considered to be integral components of the marine protected areas system.

<table>
<thead>
<tr>
<th>Wildlife Sanctuaries</th>
<th>IUCN Category</th>
<th>Gazetted</th>
<th>Co-Management Partner</th>
<th>Acres</th>
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<tr>
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<td>36,479</td>
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<td>Spanish Creek</td>
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<td>2002/87</td>
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<td>IV</td>
<td>2002/102</td>
<td>Friends of Swallow Caye</td>
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</tbody>
</table>

*Prospective co-management organisation
Protected Areas of Belize: Wildlife Sanctuaries
Aguacaliente Wildlife Sanctuary

Aguacaliente Wildlife Sanctuary is situated on the southern coastal plain and covers a 5,468 acres mosaic of wetlands, swamp forest and karstic hills. It is important as a wetland floodwater sink in times of storm events, as a natural resource for local fishermen, and for wetland birds.

Physical Features

Aguacaliente Wildlife Sanctuary is focused on a low lying basin containing lagoons, swamps and creeks, located on alluvial deposits overlying Eocene-Paleocene-limestone-Toledo bed formations. This basin is surrounded by hills and higher ground supporting forests and shrubland, cut through with creeks flowing down to the central wetland area. In the northern section of the Wildlife Sanctuary there is a small outcrop of karstic hills of cretaceous limestone, at the base of which are two hot springs – seepages of warm, sulphuric water - the features which give Aguacaliente its name.

Biodiversity

The Wildlife Sanctuary has been highlighted as a priority component of Belize’s national protected areas system, ranking within the top three protected areas in the priority ranking conducted under the National Protected Area Policy and System Plan project (NPAPSP, 2005). It is considered important as the only major inland wetland in southern Belize, for protecting both feeding and nesting resources of a rich diversity of wetland birds (Miller and Miller, 2006), including a nesting colony of American wood stork. (Meerman et. al., 2006).

It also protects a number of plant and animal species that are specifically adapted to the wetland conditions, and are unique to this area. It is critical for the conservation of the Swamp grassland without trees or shrubs and Tropical evergreen broad-leaved lowland swamp forest, Aguacaliente variant, which, within the National Protected Areas System, only occur in Aguacaliente.
Aguacaliente Wildlife Sanctuary provides a number of important environmental services in the landscape, especially in terms of its role in flood control. At times of high water levels, the wetlands are able to store large amounts of water from the surrounding swollen rivers, reducing flooding downstream. This is particularly important for minimizing flooding impacts from the Moho River, which has its sources in Guatemala, to the west. There, much of the upper watershed has been deforested, contributing to the increased threat of flash floods. The river backs up into the lowland swamps of the Wildlife Sanctuary, which act as a sponge, absorbing these waters and then gradually releasing them back into the river over time. These wetlands are also important for their ability to retain sediments and to filter nutrients such as phosphorus and nitrogen from agricultural run-off from upstream.

The Aguacaliente wetlands have been traditionally important in the local landscape for their fish resources, and have also been a focus for harvesting of forest resources - firewood, construction materials and medicines - and for hunting activities. It is recognised, however, that if traditional use is to continue, there needs to be mechanisms in place to ensure it is sustainable.

The Wildlife Sanctuary lies within a landscape of agricultural development – a matrix of large banana, citrus and rice farms, and smaller community farmlands. The requirement for more agricultural land is the primary driver of major land use changes, with clear-felling of forest, and associated increased wildfire risks, with anthropogenic fires close to and entering the protected area on an annual basis. The Wildlife Sanctuary lies adjacent to the Machaca Forest Reserve, but is otherwise isolated in this strongly human-influenced landscape, though designation as a biological corridor to protect connectivity to the sea along
the Moho River is considered a national priority, both in terms of its importance for under-represented ecosystems in the current protected area system and in terms of connectivity for Aguacaliente (Meerman and Wilson, 2005).

History of Establishment

Aguacaliente Wildlife Sanctuary was established in 1998 through Statutory Instrument 87 in recognition of its importance to waterbirds, for its importance as a wetland floodwater sink in times of storm events, and as a traditional natural resource use area for local fishermen.

Management Regime

Aguacaliente is managed under the Forest Department of the Ministry of Natural Resources, with a co-management agreement signed in 2006 between the Forest Department and Aguacaliente Management Team, a community based non-governmental organization comprised of representatives from each of the stakeholder communities. The Wildlife Sanctuary is considered to be equivalent to an IUCN Category IV area – a Habitat/Species Management Area, with management targeted at conservation through management intervention (IUCN, 1994).

Whilst the ongoing traditional fishing does not fall under the permissible activities under the Wildlife Sanctuary designation, it continues within the area. The designation is not intended to cause a shift in tradition but seeks to maintain the culture of buffer communities. Fishing with hand lines is currently allowed by the Management Team, but less sustainable methods such as the use of seine nets and poison are not.

SITE INFORMATION

Size: 5,468 acres (2,212 ha)
Statutory Instrument: SI 87 of 1998
IUCN Category: IV
Management Authority: Forest Department
Co-management Partner: Aguacaliente Management Team (AMT)
Contact Email: fdsecretary@mnrei.gov.bz

Location: Aguacaliente Wildlife Sanctuary lies on the southern coastal plain in Toledo District, near Laguna
Uses: Non-extractive - Recreation, education, research and tourism. Traditional fishing

Biodiversity Information: Rapid Environmental Assessment (Meerman et. al., 2006)
Facilities (2009): Visitors Centre, access boardwalk
Visitation (2009): No data
On-site Staff (2009): 1 site manager, 2 rangers (part time)
Cockscomb Basin Wildlife Sanctuary encompasses 122,260 acres (49,477 ha) of the Maya Mountains Massif – a landscape of ridge crests, rolling hills and river flood plains, cloaked primarily in tropical broadleaf evergreen forest. It was established following research work in the area in the 1980’s, which highlighted its value for jaguars (Rabinowitz, 1983). The area has continued to be a focal point for research into this species to this day. As the foremost of Belize’s terrestrial national protected areas, it is a valuable asset for the tourism stakeholders within the area, as well as for the local and national economy.

Cockscomb has a lot to offer visitors looking for a wilderness experience, with abundant wildlife, well maintained trails, scenic vistas, rivers, waterfalls and overnight facilities. It also provides access to Victoria Peak, the highest peak in Belize. The Wildlife Sanctuary and the adjacent Victoria Peak Natural Monument, both non-extractive protected areas, are managed as a single unit, under a co-management agreement between Forest Department and the Belize Audubon Society.

Physical Features

Cockscomb Basin Wildlife Sanctuary encompasses two major upper watersheds, South Stann Creek and parts of Monkey River, with four distinct drainage areas: Cockscomb East Basin (Sittee River), West Basin (Swasey Branch), Trio Branch and Richardson Creek. The East and West Basins are based on a foundation of granite, with elevations ranging from between 50m and almost 1,000m above sea level, with the majority of the land being below 600m. The surrounding mountains of harder quartzite and sandstone rise higher – the highest point in Cockscomb itself being Mount Copetilla, at just under 1,000m. To the south, in the Maya Mountain extension, the terrain is more rugged, with deeply dissected valleys, volcanic intrusions and extensive areas over 600m elevation. Within this extension are two unnamed peaks over 1,000m, and the better known Richardson Peak, at just under 1000m.

Cockscomb Range, lying within the contiguous Victoria Peak Natural Monument, is managed as part of the protected area, forming the northern-most ridge of the watersheds, and includes Victoria Peak itself, the second highest point in Belize, an elevation of 1,120m.
From its start as a logging camp, the facilities have developed to fulfill the role of resource protection and financial sustainability through tourism, through the renovation of the old logging buildings, and construction of new facilities. The majority of the buildings are located in a centralized area at the Headquarters site with the exception of the White House at the entrance of the Sanctuary, and a warden outpost building at Juan Branch. A central campsite is located at the Headquarters site, and a number of designated campsite facilities are scattered through the Sanctuary (at Tiger Fern, Outlier, and at 12km and 19km on the Victoria Peak trail).

### Biodiversity

A cornerstone of Belize’s present National Protected Areas System Plan, Cockscomb Basin Wildlife Sanctuary is one of nine protected areas highlighted as essential to a minimum conservation system within Belize (NARMAP, 1996). Encompassing an estimated 21 ecosystems (19 terrestrial and 2 aquatic) over a broad altitudinal range, from lowland broadleaf forest to submontane elfin woodland, this large expanse of forested uplands and valleys is a critical part of the Maya Mountains Massif, one of the last remaining large, intact blocks of forest within the region. It is considered essential for the survival of wide-ranging species such as scarlet macaw, white-lipped peccary, and ornate hawk-eagle, all of which need large blocks of contiguous forest to maintain viable populations.

Cockscomb Basin Wildlife Sanctuary provides representative coverage of several ecosystems of limited distribution in Belize, including the upper montane elfin woodland. It also harbours a significant percentage of the species found in Belize - over 58% of Belize’s mammals, 56% of its birds, 42% of non-marine reptiles and 69% of the amphibians have been recorded to date. Species of international concern include the critically endangered Zamia cycad, endangered Baird’s tapir, and black howler and spider monkeys, two species of rain frog, as well as regionally important population of scarlet macaws.

With increasing land clearance and hunting pressure throughout the adjacent landscape, the Sanctuary remains a critical stronghold for many species. The very steep surrounding ridges and relatively low xate density on the acidic soils are contributing factors deterring illegal xatero incursions, and as a result the faunal communities in Cockscomb are believed to be more intact than many other areas of the Maya Mountains Massif.

### Landscape Context

Cockscomb Basin Wildlife Sanctuary is a core component of the Maya Mountains Massif, and considered critical in the long term viability of forest species in the region. The forested slopes of the Wildlife Sanctuary provide a measure of water security and reduce the risk of flash floods for the agricultural areas and communities of the coastal plain. The protected watersheds also maintain the water clarity of rivers flowing to the Caribbean Sea, essential for the health of the Belize Barrier Reef.

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**ECOSYSTEMS**

- Lowland Broad-leaved wet Forest
- Lowland broad-leaved moist forest
- Shrubland
- Submontane Broad-leaved moist Forest
- Submontane Broad-leaved wet Forest

**SPECIES OF INTERNATIONAL CONCERN**

**Critically Endangered**

- Zamia prasina

**Endangered:**

- Alouatta pigra
- Ateles geoffroyi
- Craugastor sabrinus
- Craugastor sandersoni
- Tapirus bairdii

**Vulnerable**

- Cedrela odorata
- Dendroica cerulea
- Electron carinatum
- Eleutherodactylus leprus
- Schippia concolor
- Swietenia macrophylla

**BAS / IUCN, 2010**
Ten stakeholder communities have been identified within the immediate Cockscomb landscape, with Maya Centre and Maya Mopan most closely linked to the protected area. A further three (Dangriga, Hopkins and Placencia) benefit from the attraction of Cockscomb as a tourism destination, offering visitors a chance to experience the tropical forest and its wildlife.

Citrus, banana and cattle are the major, large-scale agricultural industries within the immediate vicinity of Cockscomb, dominating not only the land use patterns to the east and south of the Wildlife Sanctuary, but also the economy of the area. These expanding agricultural industries are starting to impact the protected area, removing the buffering forest cover in the adjacent landscape, and improving access for illegal hunting, fishing and looting, particularly by seasonal immigrant workers from the farms, but also from local community hunters and fishermen. There are also concerns over the number of jaguars being killed on an annual basis in the adjacent cattle farming areas, as farming encroaches further into the forested coastal plain, with increasing forest fragmentation.

**History of Establishment**

Since the 1940’s, the Cockscomb Basin has had a long history of timber exploitation, and was first established as a Forest Reserve in 1984, for the management of timber resources and protection of watershed functionality. Following its identification as an area of high importance for jaguar the core area was given protected status as a Wildlife Sanctuary in 1986. The area was extended in 1990 to include the rest of the Forest Reserve, and again in 1997 to include a corridor of land (previously part of the Maya Mountain Reserve) to provide connectivity with Bladen Nature Reserve to the south.

In 1998, the 4,847 acres of the adjacent Victoria Peak Natural Monument also come under Belize Audubon Society management, bringing the total area of the two contiguous protected areas to an estimated 127,107 acres.

**Management Regime**

The Forest Department is the mandated agency responsible for the management of Cockscomb Basin Wildlife Sanctuary, achieved through a co-management agreement with the Belize Audubon Society (BAS). Management is guided by a five-year management plan, which identifies a series of conservation strategies towards the protected area goal of ‘maintaining biodiversity, cultural resources and watershed areas within a functional conservation area, as an integral part of the National Protected Areas System’.

**Key Conservation Threats**

- Illegal Fishing
- Illegal Hunting
- Looting of Archaeological Sites
- Killing of Jaguars in adjacent areas

**Site Information**

| Size: 122,260 acres (49,477 ha) |
| Statutory Instrument: SI 113 of 1997 |
| IUCN Category: IV |
| Management Authority: Forest Department |
| Co-management Partner: Belize Audubon Society |
| Contact E-mail: base@btl.net |
| Website: www.belizeaudubon.org |

**Location:** Cockscomb Basin Wildlife Sanctuary straddles Stann Creek and Toledo Districts. It is located on the east-facing slopes of the Maya Mountains Massif, 15km inland from the Caribbean coastline.

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

**Management Plan:** 2005 – 2010

**Biodiversity Information:** Initial assessment - Kamstra J. 1987. Research, including work on jaguars Rabinowitz A. Silver S., Harmsen B. and others. Amphibian research (Walker et. al.).

**Visitor Facilities (2009):**
- Quam Bank Headquarters / Main office / Gift shop
- Visitor Centre
- Visitor Kitchen and Dining Room
- Conference facility

**Accommodation:**
- Dorm building (sleeping 30 people)
- Cabins / White House (sleeping 26 people)
- Campgrounds

Juan Branch Ranger Station

**Visitation (2009):** 12,815 visitors

**On-site Staff (2009):** 1 site manager, 7 rangers, supported by a park director, technical and administrative staff in the BAS office in Belize City
Corozal Bay Wildlife Sanctuary

Situated in the north east of Belize, Corozal Bay Wildlife Sanctuary is the largest marine protected area in Belize, and part of the largest estuarine system in the Mesoamerican Reef region. It encompasses approximately 178,000 acres (72,000 hectares) of the Belize portion of the Chetumal Bay estuarine system and much of the northern shelf lagoon behind Ambergris Caye. It was established in recognition of its importance in protecting the West Indian manatee.

The Wildlife Sanctuary is bordered by numerous coastal lagoons and inlets, inundated dwarf and coastal mangroves and salt marshes. The mangrove cayes support large nesting colonies of marine and wetland birds, including one of the largest colonies of magnificent frigatebirds in the region.

Physical Features

The waters of the Wildlife Sanctuary, are very shallow, with a maximum depth of approximately 7m (23 feet), and an average of 3m (9.8 feet) (Kramer & Kramer, 2002). The sediment is predominantly fine mud with algae and localized seagrass beds. Numerous coastal lagoons, mangrove and salt marshes are connected to the Bay and two rivers, including the Rio Hondo and New River, discharge into it.

With the presence of the shallow Bulkhead Shoals area to the south limiting flow in and out of the system, and the lack of flushing or strong currents, the Bay acts as an important catchment for accumulating sediments and pollutants before they reach the reef.

Biodiversity

Corozal Bay Wildlife Sanctuary is one of fourteen regional priority areas of the Mesoamerican Barrier Reef System, based on the importance of the estuarine system (part of one of the largest estuarine system flowing into the Caribbean Sea in the Mesoamerican ecoregion), manatee habitat, and extensive mangrove systems (Kramer and Kramer, 2002; Lopez-Galvez, 2007; Arrivillaga et. al.,
2010 - Directory of Protected Areas in Belize

2008), It provides protection for many species of conservation concern, among them the critically endangered goliath grouper and hawksbill turtle, and reports suggest that the small tooth sawfish may still exist in the coastal waters.

The sheltered waters of Corozal Bay have been highlighted as particularly important for mating and calving West Indian manatees (Auil, 2004; Morales-Vela et al. 2000), and the shallow bay provides a protected nursery habitat for a variety of fish species – including the goliath grouper and a number of shark species (Bonfil, 1997), including the only confirmed bull shark nursery in Belize reported from the shallow coastal waters in the southern end of the Wildlife Sanctuary (Graham, field report, 2010).

It is also an important area for many wetland bird species of national conservation concern (NPAPSP, 2005), with several mangrove cayes supporting key nesting colonies for the country. It has been identified as an integral part of the north east Important Bird Area (IBA) for these, and for Yucatan endemics, Neotropical migrants and overwintering habitats for congregating waterbird species. The shallow waters provide foraging areas for large rafts of migrating American coots, and inlets shelter flocks of blue-winged teal.

Just south of the mouth of the Rio Hondo, one of the few internationally identified sites with living stromatolite reef is reported to exist (Rasmussen et. al., 1993), an increasingly rare example of these cyanobacterial formations.

Several communities are located along the coastline of the Corozal Bay Wildlife Sanctuary. Of these, Sarteneja is considered the key stakeholder, with the greatest number of families dependent on the natural resources of the Bay using beach traps, cast nets and gill nets. It is also one of the key stakeholders of the Belize Reef, and community members have based their lives around the traditional harvesting of marine products, notably lobster, conch and finfish, along the entire Belize Barrier reef.

San Pedro, on the southern end of Ambergris Caye, is also considered a stakeholder. This large tourism centre is primarily reef-focused, but utilizes Corozal Bay for sport fishing, with several operators using the Bay.

Lying on the Belize - Mexico border, the Wildlife Sanctuary is part of a larger transboundary protected area initiative, developed as a bi-national conservation strategy for maintaining viable populations of the West Indian manatee, and is twinned with the Mexican ‘Sanctuario del Manati’. Chetumal, the largest urban settlement lying on this transboundary estuarine system, is located just to the north of the international boundary with Mexico, and is considered to have a major impact on the water quality of the Bay, with limited sewage treatment before waste enters the Bay. There are also concerns of land based pollution being washed into the Bay from the rivers – the Rio

**Landscape Context**

**LOCAL COMMUNITIES**
- Sarteneja
- Copper Bank
- Chunox
- Corozal
- Consejo
- San Pedro

**BROAD ECOSYSTEMS**
- Caribbean mangrove forest
- Seagrass
- Sparse algae / sand
- Sparse algae / silt
- Water

**CONSERVATION THREATS**
- Mangrove Clearance
- Water Pollution
- Illegally transboundary fishing
- Unsustainable fishing
- Transboundary poaching of manatees
2010 - Directory of Protected Areas in Belize

Hondo and New River, and from increasing coastal development, resulting in the removal of mangroves and critical fish nursery habitats.

**History of Establishment**

Corozal Bay Wildlife Sanctuary was established in 1998, following Belize / Mexico bilateral agreements twinning the Wildlife Sanctuary with the Sanctuario del Manati of Mexico. The Wildlife Sanctuary designation is for the protection of nationally significant species, biotic communities or physical features (in this case, the West Indian manatee), and allows for research, tourism and education but no extractive activities.

The boundaries of Corozal Bay Wildlife Sanctuary are defined by the high water mark and do not include the cayes within the marine protected area - which has implications on the ability to protect coastal and caye mangroves, important as bird nesting sites, storm barriers and as protective nurseries for many fish species.

**Management Regime**

The Forest Department is the legislated agency responsible for the management of Corozal Bay Wildlife Sanctuary, achieved through a co-management partnership with the community-based NGO - Sarteneja Alliance for Conservation and Development (SACD).

As the Corozal Bay has been traditionally of great importance to the local communities, continued extraction of natural resources has been allowed - whilst this does not fall under the permissible activities under this designation, it continues within the Wildlife Sanctuary, the designation not being intended to cause a shift in tradition but seeking to maintain the culture of the buffer communities, within the framework of maintaining the biodiversity and ecosystem values for which the area was first established.

**SITE INFORMATION**

- **Size:** 178,000 acres (72,000 ha)
- **Statutory Instrument:** SI 48 of 1998
- **IUCN Category:** IV
- **Management Authority:** Forest Department
- **Co-management Partner:** Sarteneja Alliance for Conservation and Development (SACD)
- **Contact E-mail:** sacdsarteneja@gmail.com

**Location:**

Corozal Bay Wildlife Sanctuary lies in the north of Belize, along the boundary with Mexico, and encompasses Corozal Bay. It is accessed primarily through Corozal, Sarteneja and San Pedro.

**Uses:** Non-extractive – tourism, education and research. Some traditional fishing also continues within the area.

**Management Plan:** Draft (2010)

**Biodiversity Information:** Extensive research work by Ecosur (Chetumal) on the adjacent Sanctuario del Manati. Biodiversity overview of Corozal Bay by Wildtracks for SACD (2009)

**Facilities** (2009):

- SACD Office (Sarteneja)

**Visitation** (2008):

- No data

**On-site Staff** (2009):

- 1 Head Ranger, 2 Community Ranger, supported by an Executive Director and Education Officer
The shallow freshwater system of Crooked Tree Wildlife Sanctuary provides a critical habitat for large populations of both resident and migratory wetland birds during dry season, and as such is recognized as a RAMSAR site – a wetland of international importance. The local traditional fishery has provided a major protein source for the Crooked Tree community, which is encircled by the protected area. The extensive lagoon system also provides an important overflow area for flood waters from the Belize River, reducing the threat of flooding to the more heavily populated areas to the east, including Belize City.

**Physical Features**

Crooked Tree Wildlife Sanctuary is located on the limestone Yucatan platform that forms the north of Belize, on the topographically flat northern plain. Consisting of two wetland areas (the larger centered on Crooked Tree Lagoon, the smaller on Jones and Mexico Lagoons), it includes all submerged wetlands, and extends 300 feet back from the high water shoreline. The Sanctuary is divided into two sections. The Crooked Tree lagoon system, approximately 15,000 acres, is located 2 miles to the west of the Northern Highway, and comprises of Calabash Pond, Revenge, Western, Crooked Tree (Northern) and Southern Lagoons, all of which drain south into the Belize River via a series of creeks. This section has at its centre the village of Crooked Tree. The secondary group of lagoons lies to the east of the Northern Highway, with an area of 1,400 acres, being comprised of Jones and Mexico Lagoons, also draining into the Belize River.

The Crooked Tree area is generally flat, with elevations ranging from 3 to 14 meters above sea level. This protected area forms part of the Central Watershed of Belize, composed of the Mopan and Macal Rivers to the west, which flow north east into the Belize River, and from there enter the Caribbean Sea. The lagoons are fed during the dry season by Spanish Creek, a slow moving, spring-fed system that, at the driest times, flows back out to the Belize River through Black Creek. At times of heavy rainfall, the flow of Black Creek is reversed, with water backing up from the Belize River when it is in flood, and flowing northwards into the Sanctuary, flooding the low-lying areas.

**Elevation**: 3m - 14m above sea level
**Geology**: Limestone
**Annual Rainfall Regime**: 60 - 100" (1524 – 2540mm)

**BROAD ECOSYSTEMS**
- Lowland broad-leaved moist forest
- Lowland pine forest
- Lowland savanna
- Urban
- Water
- Wetland
- Agricultural uses

**SPECIES OF INTERNATIONAL CONCERN**

**Critically Endangered**
- Central American River Turtle *Dermatemys mawii*

**Endangered**
- Yucatan Black Howler *Alouatta pigra*
- Yellow-headed Amazon Parrot *Amazona oratrix*
- Baird’s Tapir *Tapirus bairdii*

**Vulnerable**
- West Indian Manatee *Trichechus manatus*
- Mahogany *Swietenia macrophylla*
- Spanish Cedar *Cedrela odorata*

**BAS / IUCN 2010**
Crooked Tree Wildlife Sanctuary is one of nine protected areas highlighted as essential to a minimum conservation system within Belize (NARMAP, 1995), and provides critical habitat for wildlife – particularly migratory and local water birds. This subtropical freshwater wetland complex encompasses a range of ecosystems defined by geology, drainage patterns, fire and past and present anthropogenic activities.

Its biodiversity value is highlighted by its recognition as a RAMSAR site – a wetland of international importance - recognized for providing critical habitat for over 310 migratory and resident bird species, with a shallow water system that is especially important for the wetland birds. It is also a key component of Belize’s International Bird Areas. Several threatened species are protected by this conservation area, including the critically endangered Central American river turtle, and the endangered yellow-headed parrot and Baird’s tapir. Other species of concern found within the protected area include Morelets crocodile and the common slider, and the West Indian manatee, which occasionally spend time within the lagoon system when waters are high.

Northern Belize is known for its extensive areas of sugar cane, but south of Orange Walk, closer to the Crooked Tree area, the soils become unsuitable for this form of agriculture, and cattle farming becomes more predominant. This is supplemented by fishing, with fish from the lagoon systems, principally *Tilapia*, providing a significant contribution towards protein in the local diet. There are indications, however, that the income base of the Belize River Valley, and adjacent Crooked Tree community, is shifting away from rural agriculture to city-based occupations, with people commuting to Belize City each day, now that access is increasingly easy.

Whilst Crooked Tree Village is the primary stakeholder community impacting and being impacted by Crooked Tree Wildlife Sanctuary, other communities such as Biscayne, Gardenia and Lemonal are also located in the immediate area and use the natural resources, with fishing and hunting in the creeks and outlying lagoons.

The Crooked Tree wetland system plays a crucial role in flood control, storing immense amounts of excess water in the extensive flooded wetlands at times of high floods during storm events, then releasing it slowly.
through creeks back into the Belize River, providing buffering against potential flooding downstream, in the populated Belize River Flood Plain and the country’s largest urban centre, Belize City.

**History of Establishment**

The Crooked Tree lagoon system has had protected status since its declaration as Belize’s first Wildlife Sanctuary in 1984, in recognition of its critical importance to water birds (especially during the breeding and dry seasons), and its important role in the control of flood waters in the Belize River watershed.

**Management Regime**

The Forest Department is the mandated Government agency responsible for the oversight of Crooked Tree Wildlife Sanctuary, achieved through a co-management agreement with the Belize Audubon Society (BAS). Management is guided by a five-year draft management plan, which identifies a series of conservation strategies. Crooked Tree Village itself also has an active Local Advisory Committee, which provides ideas for the overall effective management of the area.

Under the current legislation, there are restrictions on activities that can take place within the area. Low impact research, educational and recreational activities are permitted, but theoretically, no extractive use (sustainable or otherwise) is currently allowed. As the Crooked Tree Lagoon system has been traditionally of great importance to the local communities, as a source of fish, fishing has been permitted - whilst this does not fall under the permissible activities under this designation, it continues within the Wildlife Sanctuary. This designation is not intended to cause a shift in tradition but seeks to maintain the culture of the buffer communities, within the framework of maintaining the biodiversity and ecosystem values for which the area was first established.

**SITE INFORMATION**

- **Size:** 37,985 acres (15,372 ha)
- **Statutory Instrument:** SI 95 of 1984
- **IUCN Category:** IV
- **Management Authority:** Forest Department
- **Co-management Partner:** Belize Audubon Society
- **Contact E-mail:** base@btl.net
  www.belizeaudubon.org

**Location:** Crooked Tree Wildlife Sanctuary lies on the flat northern lowlands of Orange Walk and Belize Districts, encompassing the wetlands that drain into the Belize River. The Wildlife Sanctuary lies to the west of the Northern Highway, and surrounds the community of Crooked Tree.

**Uses:** Non-extractive - Recreation, education, research and tourism. Traditional fishing.

**Visitor Facilities:** Visitors Centre, trail system with raised boardwalks

**Visitation (2009):** 1,212 visitors

**Site Staff:** 1 site manager and 3 rangers, supported by technical and administrative staff in the BAS office in Belize City

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**The Ramsar Convention**

The Convention on Wetlands of International Importance, also called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Crooked Tree Wildlife Sanctuary is Belize’s only RAMSAR site, based on its “international significance in terms of ecology, botany, zoology, and hydrology”, and conserves important ecological processes and fish resources used by the local communities, as well as providing a nesting and feeding ground for large number of resident and migratory water birds.
Gales Point Wildlife Sanctuary

Gales Point Wildlife Sanctuary is centered on Southern Lagoon, one of two large, connected large lagoons on the central coastal plain. It has long been recognized for its importance for the West Indian (or Antillean) manatee, being highlighted as an area with one of the highest populations of this species within Belize (O'Shea, 1989; Auil, 1998). The Wildlife Sanctuary covers a complex matrix of brackish lagoons, creeks and mangrove mudflats, as well as a portion of the Manatee River and Cornhouse Creek.

Physical Features

The area encompasses Southern Lagoon and its sub-lagoons - Sapodilla Lagoon, Western Lagoon, the Quashie Trap Lagoon (including the Bar River and the Quashie Trap tributary), as well as a portion of the Manatee River and Cornhouse Creek. It also includes the 66’ shoreline along all the lagoons and waterways within the Wildlife Sanctuary, with the exception of the shoreline of the Gales Point peninsula.

The primary stakeholder community is Gales Point, with a population estimated at approximately 250 (Wildtracks survey data, 2007), consisting of households lined along a narrow peninsula that juts northwards into the lagoon system. This very traditional community is heavily reliant on the natural resources of the Wildlife Sanctuary and adjacent areas.

Biodiversity

Gales Point Wildlife Sanctuary’s primary importance within Belize’s protected areas system lies in the protection of the West Indian manatee, a species listed as ‘vulnerable’ (IUCN, 2010), which congregates within the lagoon system. Two ‘critically endangered’ species have also been recorded within the protected area - the goliath grouper, and the regionally endemic Central American river turtle.

The shallow coastal lagoon system performs a valuable function as a sediment settling area, removing sediment and agricultural contaminants from the creeks and rivers flowing across the coastal plain, before they reach the sea. It is also important for national species of concern, including the waterbirds that frequent the area, both for nesting and for feeding – the great blue heron, roseate spoonbill, white ibis, reddish egret of the lagoons, and the more secretive agami heron and muscovy duck of the rivers and creeks (Meerman, 2005).

| Elevation: 0m above sea level |
| Geology: Limestone |
| Annual Rainfall Regime: 60 - 80” (1524 - 2032mm) |

| BROAD ECOSYSTEMS |
| Mangrove and littoral forest |
| Wetland |
| Brackish Lagoon |

| SPECIES OF INTERNATIONAL CONCERN |
| Critically Endangered |
| Goliath grouper | Epinephelus itajara |
| Hawksbill turtle | Eretmochelys imbricata |
| Central American River Turtle |
| Vulnerable |
| West Indian Manatee | Trichechus manatus |
| American Crocodile | Crocodylus acutus |
| Cubera snapper | Lutjanus cyanopterus |

IUCN, 2010
Another focal point of conservation interest lies to the east, on the sand bar facing the Caribbean Sea, outside the Wildlife Sanctuary. Originally identified as one of the most important nesting beaches within the Western Caribbean, the ‘critically endangered’ hawksbill turtles return here each year to nest, though now in much reduced numbers.

**Landscape Context**

Gales Point, the primary stakeholder community, is located on a narrow peninsula that extends into the Gales Point Wildlife Sanctuary. It is the only community to lie adjacent to the protected area, and has always been strongly tied to the natural resources, with a high dependency on fishing and hunting, the fish stocks of Southern Lagoon and its associated creeks and rivers being considered one of the most important food resources for the community. Quamina Creek, feeding into the lagoon system from the south, has traditionally also been the freshwater source for Gales Point.

In the last 10-15 years, Gales Point has built on its cultural traditions and natural resources to create a small scale tourism base, and recognizes the need for active management of the Wildlife Sanctuary and adjacent natural areas and wildlife if this industry is to expand in the future. Without further tourism, this small community and its rich culture will not be able to develop the economic base necessary for its survival.

Other communities that also impact the area include Freetown Sibun, Belize City to the north, Dangriga, to the south – and even coastal communities of Honduras, primarily through fishing activities on the coastline and into Bar River, which provides connectivity between Southern Lagoon and the sea.

**History of Establishment**

The Southern Lagoon was designated in 1998 as the Gales Point (West Indian Manatee) Wildlife Sanctuary under the National Parks System Act (1981) following recognition of its importance for the manatee during planning for the establishment of the Manatee Special Development Area. The boundaries of Gales Point Wildlife Sanctuary are defined by Statutory Instrument 92 of 1998, and include the 66’ margin above the high water mark.

**Management Regime**

The Gales Point Wildlife Sanctuary is administered under the Forest Department, with the community-based Gales Point Wildlife Sanctuary Community Management Committee taking on the co-management role. There is a collaborative agreement with the Belize Fisheries Department on the protection of the turtle nesting beach on Manatee Bar, though this lies outside the Gales Point Wildlife Sanctuary.
Spanish Creek Wildlife Sanctuary

Spanish Creek Wildlife Sanctuary occupies approximately 6,000 acres of lowland terrain in northern Belize, straddling the boundary of the Belize and Orange Walk Districts and focused on Spanish Creek itself and the tropical broadleaf forest on its banks. This Wildlife Sanctuary forms an important link in the Northern Biological Corridor, and is co-managed by the Forest Department and the Rancho Dolores Environment and Development Group.

**Physical Features**

The Wildlife Sanctuary lies within the Belize River watershed, along Spanish Creek, south of Rancho Dolores. Spanish Creek flows northwards, out of the Wildlife Sanctuary, through Rancho Dolores and Lemoal, and forms part of the sub-watershed of Western and Northern Lagoons of Crooked Tree. It is a wide, slow flowing river that rapidly becomes shallow south of Rancho Dolores, with sandbars and fallen trees impeding progress (Walker et. al. 2000). The creek is supplied by a number of small springs within the protected area and in the adjacent Rio Bravo Conservation and Management Area (Meerman et. al. 2004). Flow and water level are, however, largely influenced by processes outside the boundaries of the Wildlife Sanctuary, the area forming part of the flood sink of the Crooked Tree system with high water reflecting backed up waters from the Crooked Tree Lagoons during storm events (Meerman et. al. 2004), the creek contributing to Crooked Tree’s role in flood control.

The forest to either side of the creek covers an underlying rock of limestone, with a small number of limestone outcrops being visible near Spanish Creek itself.

**Biodiversity**

Within the Wildlife Sanctuary, Spanish Creek runs through cohune-dominated lowland broadleaf moist forest over moderately lime rich alluvium. A riparian strip of flood-tolerant vegetation lines each side of the watercourse, whilst towards the head of the creek, the riverine vegetation is gradually replaced by steep banks topped with cohune-dominated forest, growing practically to the creek edge.

The more remote areas of Spanish Creek support many of Belize’s characteristic forest-dwelling mammal species, with the reputation of having abundant wildlife, tracks of jaguar and tapir suggesting that there is sufficient connectivity with the Rio Bravo area to maintain viable populations. With increasing hunting pressure, however, it is reported locally that game species are now scarce (Walker et. al. 2000).

The further reaches of Spanish Creek still have the critically endangered Central American River Turtle, as well as harbouring the shy, elusive agami heron and muscovy ducks, among other species, making the area attractive as a potential birding destination.
The Wildlife Sanctuary lies within the Belize River Valley, and is bounded on the west by the Rio Bravo Conservation and Management Area, linking this with the Community Baboon Sanctuary, lying 2.5 miles to the east, and contributing to the maintenance of connectivity in the Northern Biological Corridor. The southern boundary is formed by Labouring Creek.

Rancho Dolores is the closest community, located immediately to the north of the Wildlife Sanctuary, with Big Falls, St Paul’s Bank, Double Head Cabbage and Bermudian Landing also within the general area. Agriculture is the dominant economic activity in the area, though there is a move towards employment in Belize City, and much of the old farmland is now abandoned.

Spanish Creek itself is used by Rancho Dolores for fishing, both fishermen and women actively supplying their households with fresh fish. Green iguanas, Central American river turtles (hicatee), Mexican giant musk turtle (freshwater loggerhead), and common slider (bocatora) are subject to varying degrees of hunting pressure, this being at its greatest close to Rancho Dolores, with these species reported as far less abundant now than 2-3 decades ago (Walker et. al. 2000).

The protected area is considered to be a potential resource for local tourism, with a number of features of touristic value including high bird diversity, and the presence of prominent species such as Morelet’s crocodile and the black howler monkey, though the remoteness of the site is a barrier to many tourists (Meerman, 2004).

Spanish Creek Wildlife Sanctuary was established in 2002 for the protection of local biodiversity, and to strengthen corridor connectivity between Rio Bravo, the Community Baboon Sanctuary and Crooked Tree Wildlife Sanctuary, as part of the Northern Biological Corridor.

The Forest Department is the legislated agency responsible for the management of Spanish Creek Wildlife Sanctuary, and has an informal co-management agreement with the community-based NGO – Rancho Dolores Environment and Development Group.

### Landscape Context

The Wildlife Sanctuary lies within the Belize River Valley, and is bounded on the west by the Rio Bravo Conservation and Management Area, linking this with the Community Baboon Sanctuary, lying 2.5 miles to the east, and contributing to the maintenance of connectivity in the Northern Biological Corridor. The southern boundary is formed by Labouring Creek.

Rancho Dolores is the closest community, located immediately to the north of the Wildlife Sanctuary, with Big Falls, St Paul’s Bank, Double Head Cabbage and Bermudian Landing also within the general area. Agriculture is the dominant economic activity in the area, though there is a move towards employment in Belize City, and much of the old farmland is now abandoned.

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The protected area is considered to be a potential resource for local tourism, with a number of features of touristic value including high bird diversity, and the presence of prominent species such as Morelet’s crocodile and the black howler monkey, though the remoteness of the site is a barrier to many tourists (Meerman, 2004).

### History of Establishment

Spanish Creek Wildlife Sanctuary was established in 2002 for the protection of local biodiversity, and to strengthen corridor connectivity between Rio Bravo, the Community Baboon Sanctuary and Crooked Tree Wildlife Sanctuary, as part of the Northern Biological Corridor.

### Management Regime

The Forest Department is the legislated agency responsible for the management of Spanish Creek Wildlife Sanctuary, and has an informal co-management agreement with the community-based NGO – Rancho Dolores Environment and Development Group.

## SITE INFORMATION

- **Size:** 6,000 acres (2,428 ha)
- **Statutory Instrument:** SI 87 of 2002
- **IUCN Category:** IV
- **Management Authority:** Forest Department
- **Co-management Partner:** Rancho Dolores Environment and Development Group
- **Contact E-mail:** fdsecretary@mnre.gov.bz
- **Location:** Spanish Creek Wildlife Sanctuary lies on Spanish Creek, in the Belize River Valley, with Rancho Dolores to the north
- **Uses:** Non-extractive – tourism, education and research
- **Management Plan:** None

### Biodiversity Information

- **Rapid Environmental Assessment (Meerman et. al. 2004)**
- **Visitor Facilities (2009):** No data
- **Visitation (2008):** 10
- **On-site Staff (2009):** 1 site manager, 1 head ranger, 2 rangers
Swallow Caye Wildlife Sanctuary encompasses approximately 8,972 acres of shallow waters and cayes within the Drowned Cayes area. It was established in response to lobbying by Lionel “Chocolate” Heredia, along with Friends of Swallow Caye and tour guides from Belize City, Caye Caulker and San Pedro, to protect this important feeding and breeding area of the vulnerable West Indian manatee. This mangrove-lined matrix of cayes and waterways is located a few miles east of Belize City and south of Caye Caulker, and is a popular tourism resource, the water clarity making it easy 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 in 1992 (Auil, 1998). Since its establishment, the presence of the rangers ensures that there is careful monitoring and management of visitor interactions, and the manatees have returned.

The area is, however, also increasingly impacted by heavy traffic from water taxis, tour boats and barges, particularly with the increasing activities of cruise ship passengers visiting Belize. With increasing evidence of propeller scars on the manatees using the area (Self-Sullivan, 2004), there is growing concern as to the viability of the manatee population.

The protected area lies in the shallow barrier reef lagoon, between the Barrier Reef and the mainland coastline, and encompasses both marine and caye components. Within the boundaries lie Swallow Caye and Mapp’s Caye, both part of the northern Drowned Cayes, a string of mangrove islands about 13 km long, located about 8 km east of Belize City and less than 2 km west of the Barrier Reef. The cayes are located on the northern end of a fossil reef platform that runs south behind the current reef, and are based on mudstones. They are dissected by a series of mangrove-lined, tidal channels ('bogues') ranging in depth from 1m to 9m, some of which traverse the cayes, fragmenting the mangrove habitat and providing travel routes for the manatees from one activity area to another, whilst others form dead ends, providing sheltered resting, mating, calving and nursing areas.

Swallow Caye Wildlife Sanctuary is centered around a series of semi-inundated mangrove cayes with freshwater availability and interconnecting east-west, mangrove-lined, tidal channels, which, combined with the abundant seagrass beds on the periphery of the cayes, provide ideal conditions for the West Indian manatee, and relatively unimpacted by human development.

The Wildlife Sanctuary is focused specifically on the protection of the West Indian manatee, and there has been little assessment of...
other biodiversity within area. With the proximity to the reef, the seagrass beds have large corals scattered sparsely through the area, and the shallow waters are considered to be important as a conch nursery area (Kramer et. al., 2002). With the inundated mangrove channels and proximity to the reef, The Drowned Cayes area also provides important habitat for bottlenose dolphins (*Tursiops truncatus*), American crocodiles (*Crocodylus acutus*), many passerines and waterbirds (e.g., swallows, warblers, herons, egrets), game fish (permit, tarpon, snook), and serves as a nursery for reef fish and inverts, especially snapper, conch, and lobster (Self-Sullivan, pers. com.).

**Landscape Context**

Swallow Caye Wildlife Sanctuary is known to be important for the West Indian manatee, with relatively large numbers congregating in the area. With the ease of access, clear waters and high probability of seeing these large mammals, the protected area has become an important tourism resource for tour guides and operators of Caye Caulker, San Pedro and Belize City.

It lies within an area of high boat traffic, between Belize City and the most popular caye destinations, and as such the impacts to the manatees and the ecosystems on which they depend are increasing. Development impacts – mangrove clearance and dredging, are already starting on the adjacent cayes of the Drowned Cayes and Stake Bank, and are predicted to increase, increasing the importance of the Wildlife Sanctuary, with its seagrass and mangroves, in protecting local marine life.

**History of Establishment**

Swallow Caye Wildlife Sanctuary was designated in 2002, specifically to provide greater protection to the manatee population of the Swallow Caye area. The main force behind the creation was the concern of local stakeholders, the community-based Friends of Swallow Caye, which has been promoting Swallow Caye Wildlife Sanctuary since the group’s establishment in 1996. The group lobbied for protective status for the area, with the development of a series of rules and regulations, in response to the increased boat and tourism activity in the Drowned Cayes area.

**Management Regime**

Swallow Caye Wildlife Sanctuary is currently under the mandate of the Forest Department, which works in partnership with the community based NGO - Friends of Swallow Caye (FOSC), under a co-management agreement. The group was organized to promote the designation of this area as a Wildlife Sanctuary, and works “to safe guard the future of manatees by reducing threats to their health and their habitat.” FOSC has active members from Belize City, Caye Caulker and Ambergris Caye, and an office located on Caye Caulker.
Marine Reserves
Marine Reserves

Marine protected areas are one of the most important conservation tools available to Belize to ensure the conservation of the marine environment – the internationally acclaimed Belize Barrier Reef Reserve system, with its protective barrier reef, pristine atolls, sheltered seagrass meadows and rich marine life. The Belize reef is recognized for its global importance through the designation of a serial World Heritage Site nomination of seven sites, and, like the terrestrial protected areas, contributes towards global goals and standards laid out under the Convention on Biological Diversity.

Belize has thirteen marine protected areas, eight of which are Marine Reserves, administered by the Belize Fisheries Department (Department of the Ministry of Agriculture and Fisheries). Management is either direct, by Fisheries Department staff, or in partnership with a co-management agencies (large NGOs - the Southern Environmental Association (SEA) and Toledo Institute for Development and Environment (TIDE)).

<table>
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<tr>
<th>Protected Area</th>
<th>Mgmt. / Co-mgmt</th>
<th>IUCN Category</th>
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</table>

2 Hol Chan Marine Reserve Amended / Regulations, 2008
3 Caye Caulker Marine Reserve Regulations, 2008
Bacalar Chico Marine Reserve covers approximately 15,530 acres (6,284 ha) of marine habitat within the Bacalar Chico Marine Reserve / Bacalar Chico National Park conservation unit, one of seven marine protected areas that form Belize’s World Heritage Site. It is situated at the northernmost tip of Ambergris Caye, and includes the most northerly part of the Belize Barrier Reef System, which runs parallel to the east facing shore for almost 1km, and is the only point where the reef meets the shoreline. To the west, the Marine Reserve includes part of the shallow, brackish Chetumal Bay, contiguous with the Corozal Bay Wildlife Sanctuary, and to the north, the marine protected area boundary runs along the Belize / Mexico international border.

**Physical Features**

Within the Marine Reserve, the barrier reef, with its spur and groove formations on the fore-reef and relatively unbroken reef crest, runs parallel to the coastline, forming a fringing reef that lies approximately 1km off-shore to the east of northern Ambergris Caye. It then meets the caye at Rocky Point - the only point at which the barrier reef meets the land within the Mesoamerican Reef region. Here, the unique geological formation of Pleistocene fossilized coral bedrock is exposed.

The back-reef and shallow lagoon, with sea grass and patch reefs, separates the reef from the coastline, both north and south of Rocky Point.

**Biodiversity**

This Marine Reserve is noted for its rich biodiversity and its geological importance, and has been designated as part of Belize’s World Heritage Site, a system of seven protected areas considered to represent the globally recognised qualities of Belize’s reef system. The area protects a number of species of international conservation concern, including the critically endangered goliath grouper, hawksbill turtle and critically endangered staghorn and elkhorn corals (*Acropora cervicornis* and *A. palmata)*.

The Rocky Point spawning aggregation site, located 1km offshore, provides ideal conditions for a number of commercially important species including black grouper, dog snapper, and horse-eye jack. The off-shore area is also recognised as an important conch nursery for both Belize and the adjacent Mexican fisheries sectors.

The east facing beaches are important for nesting turtles, with all three species – loggerhead, green and hawksbills - being reported as nesting in 2008 (BCMR Annual Report, 2008).
**Landscape Context**

This trans-boundary area, bordered to the north by Mexico, includes part of the Belize Barrier Reef, a major component of the Mesoamerican Reef that runs from the Yucatan to Honduras, and contributes to the viability of marine resources, including the commercially important fish stocks, lobster and conch.

This Marine Reserve is part of the combined Bacalar Chico Marine Reserve / National Park management unit. San Pedro, the primary stakeholder community, is located at the south end of Ambergris Caye. With a population of approximately 10,400, San Pedro relies primarily on tourism, and is primarily reef-focused.

**History of Establishment**

Bacalar Chico Marine Reserve was established in 1996 as part of Belize’s World Heritage Site, to protect Rocky Point for its geological importance, a conch nursery, and the Rocky Point spawning aggregation site.

**Management Regime**

A priority goal is to ensure the health of the fishery stock, with enforcement against illegal fishing and other illegal activities detrimental to the health of the flora and fauna. It was also established as a site for monitoring and research activities, and a venue for recreational activities, providing job opportunities for tour guides, at the request of tourism stakeholders in Sarteneja.

The protected area is considered to be within the IUCN Category IV – a Habitat/Species Management Area, with active management targeted at conservation through management intervention (IUCN, 1994). The Marine Reserve has clear zones embedded in the legislation that allow for extractive / non extractive use, and conservation protection, with use concentrating on fishing, tourism, and research.

Management responsibility for Bacalar Chico Marine Reserve is held by the Fisheries Department, which has established a staffed Fisheries Base on Middle Caye for site-level management of the area.

Blue Ventures, an international conservation volunteer organization based in the UK, provides assistance to the Fisheries Department through collaborative research and monitoring activities.

**CONSERVATION THREATS**

- Coastal Development
- Trans-boundary Fishing Incursions
- Tourism
- Unsustainable Fishing

**SITE INFORMATION**

- **Size:** 86,653 acres (35,067 ha)
  - Preservation Zone 638 acres (258 ha)
  - Conservation I Zone 1,573 acres (636 ha)
  - Conservation II Zone 1,987 acres (804 ha)
  - General Use Zone 11,379 acres (4,605 ha)
  - Spawning Aggregation Site 1,402 acres (567 ha)
- **Statutory Instrument:** SI 68 of 2001 / 136 of 2001
  - Original SI: SI 88 of 1996
  - Spawning Aggregation Site: SI 162 of 2003
- **IUCN Category:** IV
- **Management Authority:** Fisheries Department
- **Contact:** species@btl.net
- **Location:** Bacalar Chico Marine Reserve is situated at the northernmost tip of Ambergris Caye, and includes the only point where the reef meets the shoreline.
- **Uses:** Extractive and Non-extractive – fishing, tourism, and research
- **Management Plan:** Draft, 2004
- **Biodiversity Information:** Past assessments by Green Reef. Current collaboration with Blue Ventures.
- **Facilities (2009):** Visitors Centre, access boardwalk
- **Visitation (2009):** No data
- **On-site Staff (2009):** 1 site manager, 2 rangers, 1 biologist
Caye Caulker Marine Reserve lies to the east of the tourism island destination of Caye Caulker, 21 miles east of the mainland, and is part of the 9,000 acre (3,640 ha) Mesoamerican Barrier Reef System. With the associated Caye Caulker Forest Reserve, this management unit encompasses five habitats – mangrove, littoral forests, lagoon marshlands, sea grass beds and the coral reef, which runs north-south, parallel to the entire caye. The Marine Reserve is focused on the marine areas, and is divided into three zones – the Preservation, Conservation and General Use Zones.

**Physical Features**

The Marine Reserve lies on a submerged portion of the limestone Yucatan Platform, and includes part of the barrier reef, established on the upturned ridge of the first of a series of marine ridges that run parallel to the coast, resulting from the tilting of fault blocks in the geological history of Central America. The majority of the protected area falls within the Northern Shelf Lagoon, between the reef crest and the Caye Caulker shoreline.

The Marine Reserve is easily accessible from Caye Caulker, a popular tourism destination, and provides sheltered snorkeling and diving opportunities.

**Biodiversity**

This popular Marine Reserve stretches from the shallow sea grass beds of the reef lagoon, adjacent to Caye Caulker, to beyond the fore-reef and reef drop off. It includes both spur and groove and reef crest formations, as well as scattered patch reefs within the reef lagoon, with abundant marine life, providing opportunities for both snorkelling and diving.

Species of international concern include the critically endangered staghorn and elkhorn corals (*Acropora cervicornis* and *A. palmata*), as well as the critically endangered hawksbill and endangered green and loggerhead turtles. The vulnerable West Indian manatee use the Marine Reserve, as do bottlenose dolphins.
The Marine Reserve is a part of the marine protected areas system of Belize, and is particularly important to the economy of Belize, in its value as a tourism resource. It is also important for the environmental services it provides - in its role of maintaining the health of the reef and maintenance of local commercial species, and the protection of Caye Caulker from storm surges and erosion.

Caye Caulker, with an estimated resident population of 630 (AoS, 2007) is the closest stakeholder community, and is heavily dependent on the tourism attracted by the proximity of the adjacent reef.

Caye Caulker Marine Reserve was established following lobbying by the Siwa-ban Foundation and other Caye Caulker stakeholders from the early 1990’s onwards. The eventual designation of the area as a Marine Reserve occurred in 1998, as part of a single management unit, paired with the Caye Caulker Forest Reserve, ensuring the protection of the continuum of littoral forest through mangrove to reef lagoon, reef crest and fore reef.

Management responsibility for Caye Caulker Marine Reserve is held by the Fisheries Department, with significant input from the co-management partner - the Forest and Marine Reserve Association of Caye Caulker (FAMRACC).

Use of the Marine Reserve is regulated through zonation. The General Use Zone permits fishing by traditional users through a special license system. Catch and release sport fishing is also permitted.

The Conservation and Preservation Zones are both non-extractive. The Conservation Zone allows for non-extractive recreational use – primarily snorkeling and diving - with no commercial or sport fishing allowed. The Preservation Zone does not allow any activity (fishing or recreational), nor does it allow entrance to motor boats, except in emergencies.

**SITE INFORMATION**

- **Size:** 9.670 acres (3,913 ha)
  - Preservation Zone 1,442 acres (584 ha)
  - Conservation Zone 2,029 acres (821 ha)
  - General Use Zone 6,199 acres (2,509 ha)

- **Statutory Instrument:** SI 35 of 1998
- **Legislation of Zones:** SI 115 of 2008
- **Regulations:** SI 127 of 2008

- **IUCN Category:** VI
- **Management Authority:** Fisheries Department
- **Co-management Partner:** Forest and Marine Reserve Association of Caye Caulker (FAMRACC)
- **Location:** Caye Caulker Marine Reserve is situated directly east and north east of Caye Caulker.
- **Uses:** Extractive and Non-extractive – fishing, tourism, and research
- **Management Plan:** 2004 – 2009 (McRae, CZMAI)
- **Biodiversity information:** 2003 REA (McRae).
- **Independent researchers** (Greenfield, Smithsonian, WRISCS). Patch reef baseline data (University of Wisconsin). Biodiversity information is available within the management plan.
- **Facilities (2009):** No data
- **Visitation (2008):** 10,880
- **On-site Staff (2009):** 1 site manager, 1 ranger, 1 biologist, supported by FAMRACC and regional office in San Pedro
Gladden Spit and Silk Cayes Marine Reserve is world-famous for the whale sharks that congregate at the Gladden Spit promontory. For ten days after the full moon of each lunar cycle between March and June, the whale sharks gather, feeding on the spawn produced by thousands of fish that form the Gladden Spit spawning aggregation (SPAG). Many of these are commercially important species that support the traditional fishing industry in Belize.

The idyllic sand beaches of the Silk Cayes, the shallow clear waters, vibrant coral reefs and prolific sea grass provide habitats for many marine species. These islands are also an increasingly important tourism destination.

Physical Features

The primary focus of the Marine Reserve is one of the best developed sections of the Belize Barrier Reef, which runs along the ridge of the first of three northeast-southwest escarpments that lie parallel to the coastline. The third escarpment provides the foundation for Lighthouse Reef and Glover’s Reef atolls, and then extends south to intersect the Barrier Reef at Gladden Spit itself, forming a unique geological promontory that drops to a depth of 250 m to the east, resulting in the water current conditions required for the regionally important spawning aggregation site.

To the west, the shallow lagoon is protected behind the barrier reef, and is considered an excellent example of a barrier reef platform. Situated on this platform within the Marine Reserve are the Silk Cayes - three sand cayes (Northern, Middle and South Silk Caye) that change shape with each major tropical storm that sweeps the area.

Biodiversity

The Gladden Spit and Silk Cayes Marine Reserve encompasses some of the best formed examples of barrier reef structure in the region, with the core components of fore-reef (with extensive spur and
groove formation), reef-crest, and back-reef all being present. Sea grass beds, important for connectivity and for the maintenance of commercial species such as conch, lie in the shallow back-reef lagoon. These ecosystems support many marine species important for both the commercial fishing and tourism industries as well as eleven species of international concern (critically endangered, endangered or vulnerable – IUCN, 2008) – including the Hawksbill turtle and goliath grouper.

Gladden Spit has been identified as the highest priority spawning aggregation site in Belize (Heyman et al. 2002) and the largest in the ecoregion (Kramer and Kramer, 2002), supporting more than 30 species of fish, including grouper and snapper, each congregating in the thousands at full moon. This in turn attracts one of the largest predictable whale shark congregations in Belize, and in fact the Mesoamerican region, providing an important tourism resource for Placencia and other coastal communities of Belize.

**Landscape Context**

Gladden Spit and Silk Cayes Marine Reserve form part of the Belize Barrier Reef, lying within the regional Mesoamerican Barrier Reef System, which stretches for more than 1000 kilometres (625 miles) along the coast of Belize, Guatemala, Honduras and Mexico. The Marine Reserve also lies within the national system-level management unit of the Southern Belize Reef Complex, a seascapes planning unit that also includes South Water Caye, Laughing Bird Caye National Park and Sapodilla Cayes Marine Reserve.

The Marine Reserve acts as an important source (for larvae and adult fish) for national and regional populations of commercial finfish species, particularly for those species that congregate at the spawning
aggregation site at the Gladden Spit promontory. It also provides regulated use areas for lobster and conch, the traditional basis of Belize’s fishing industry.

The Marine Reserve provides an economic resource for fishermen from the northern and central fishing communities, focusing on lobster and conch, with some finfish, in the large General Use Zone of the protected area. A number of fishermen from the central fishing communities also have special licenses to access the spawning aggregation site itself, though this is strictly regulated, being confined to long-term traditional users, who also participate in monitoring of fish catches.

Tourism is based primarily out of Placencia, Hopkins, Seine Bight, Monkey River and Dangriga, with some visitation from Belize City and caye-based hotels in the area.

**History of Establishment**

Gladden Spit and Silk Cayes Marine Reserve (GSSCMR), was originally established in May 2000 following lobbying from Friends of Nature (FoN), a local, community based organization. It was designated as a Marine Reserve in 2003, principally for the protection of the Gladden Spit spawning aggregation site, the congregating whale sharks, and the tourism value of the Silk Cayes. The overlapping spawning aggregation site has seasonal protection under separate legislation, also designated in 2003, following concern at the declining populations of spawning fish at the congregations throughout Belize.

**Management Regime**

The Marine Reserve has clear zones embedded in the legislation that allow for extractive / non-extractive use, and conservation protection, with use concentrating on sustainable fishing, tourism, research and education. Since the signing of the first co-management agreement in 2001, management has been assisted through collaboration with Friends of Nature (FoN) – now the Southern Environmental Association (SEA). SEA is responsible for day-to-day management of the reserve, including activities such as patrols and fee collections, and has been working more closely with the Fisheries Department in 2008 and 2009 to improve management and scientific monitoring.

**SITE INFORMATION**

- **Size:** 26,000 acres (10,523 ha)
  - Conservation Zone: 378 acres (153 ha)
  - General Use Zone: 25,622 acres (10,370 ha)
  - Gladden Spit*: 1,280 acres (518 ha)
- **Statutory Instrument:** SI 95 of 2003
- **Spawning Aggregation Site SI 162 of 2003**
- **IUCN Category:** IV
- **Management Authority:** Fisheries Department
- **Co-management Partner:**
  - Southern Environmental Association (SEA)
- **Contact E-mail:** info@seabelize.org
- **Web site:** www.seabelize.org

**Location:** Gladden Spit and Silk Cayes Marine Reserve lies offshore, on the Barrier Reef, 36km east of Placencia, the primary point of access for visitors.

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

**Management Plan:** In prep. (2010)

**Biodiversity information:** SEA, WCS (whale sharks, commercial fish species); Heyman (spawning aggregations); Conservation International (MMAS) and various independent researchers.

**Facilities (2009):** Bathroom facilities, picnic tables on Middle Silk Caye.

**Tourism Visitation (2009):** 4,700

**On-site Staff (2009):** 1 head ranger, 2 rangers, supported by the SEA central office staff in Placencia

*Overlapping spawning aggregation site
Glover’s Reef Marine Reserve

Glover’s Reef Marine Reserve encompasses the southernmost of Belize’s three offshore atolls, and is considered not only the best developed biologically, but also to possess the greatest diversity of reef types (Dahl et. al. 1974). It was established as a Marine Reserve in 1993 to provide protection for both the physical and biological resources of the area, and is an important fishing ground for traditional conch and lobster fishermen, particularly from the northern coastal community of Sarteneja. In 1996, it was included as one of seven marine protected areas in Belize to be recognised for their global value, as part of Belize’s World Heritage Site.

Physical Features

The Marine Reserve encompasses all of Glover’s Reef Atoll, the most southerly of the three atolls of Belize, and is 35km in length and 7.5km wide, covering approximately 200km², extending out to the 100-fathom depth contour. Considered somewhat isolated from the Barrier Reef and the mainland, the Atoll sits on the third and most easterly of three tilted submarine escarpments, on a base of metamorphic rock overlain with calcareous siltstone and reef accumulation. This carbonate reef platform is thought to have been formed during the last interglacial era, in an area where limestone build-up has been at a rate equal to or greater than the speed of subsidence caused by the movement on the faults.

The atoll is surrounded by deep water on all sides, with depths of 300 to 400m to the north and west, and reaching 1000m to the east. The overall structure of the atoll includes the rim, lagoon, patch reefs, and channels, and provides a variety of sheltered habitats for marine biodiversity. The relatively deep lagoon is studded with approximately 850 patch reefs and pinnacles that rise to the surface. The peripheral reef, the rim of the Atoll, has six sand cayes that lie on the reef crest along its south-eastern edge, and is broken in only three places by deep channels, allowing for the tidal flow of water between the lagoon and the open sea.

Biodiversity

The Atoll is considered one of the highest priority areas in the Mesoamerican Caribbean Reef system, providing recruitment, nursery, feeding and dwelling areas for lobster, conch and finfish, and unique fish habitat in the interior lagoon (Kramer and Kramer, 2002). It is recognised for supporting extraordinarily high biological diversity and possessing the greatest range of reef types in the Caribbean Sea. The shallow, 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, and numerous species of coral (Walker et.
al., 2007). The benthic community of corals and sponges on the western wall of Glover’s Reef is considered among the most diverse and densely covered sites reported anywhere in the Caribbean, exhibiting 95% living cover and as many as 11 species per square meter (Gibson et. al., 2004).

Located at the north-eastern point of the Atoll is one of the Caribbean’s largest and last remaining viable Nassau grouper spawning aggregations in Belize, a spectacular biological phenomenon with cultural and economic importance that is severely threatened across the Caribbean (Gibson et. al. 2004). This spawning aggregation site is not only important for the maintenance of the endangered Nassau grouper, but also several other species of grouper and snapper (Kramer and Kramer, 2002). The littoral forest, considered the most threatened ecosystem in Belize, is well represented within the Marine Reserve, including on Middle Caye, providing habitat for the endemic Belize Atoll gecko (*Phyllodactylus insularis*), as well an important way-point for Neotropical migrants and nesting structure for resident birds.

**Landscape Context**

The Atoll is of economic importance to Belize as a lobster, conch and finfish resource for fishermen. The majority of the Glover’s Reef fishermen originate from Sarteneja, Dangriga and Hopkins, with a small number from Belize City. The Dangriga and Hopkins fishermen primarily use hand lines for finfish, whilst those from Sarteneja free-dive for Spiny Lobster and Queen Conch. Both of these species have declined since the early 1980’s, when the industry was at its peak, resulting in declining catches and incomes for the fishing stakeholders.

With its reputation for abundant large fish, spectacular reef, and extensive flats famous for bonefish and permit, Glover’s Reef is a popular tourism destination, providing an important resource for adjacent coastal communities - particularly for the Dangriga and Hopkins tourism stakeholders. The majority of visitors are divers, snorkelers, kayakers, and/or fly fishermen, generally hosted by one of the four low-key tourism operations based on the cayes, or on day trips originating from the mainland and other cayes.

**History of Establishment**

The approximately 86,653 acre Glover’s Reef Marine Reserve was established as a protected area in 1993, and encompasses the marine area of the Atoll, managed under the Fisheries Department of the Ministry of Agriculture and Fisheries. The Statutory Instrument was updated in 2001, and currently designates five different management zones: the General Use Zone, Conservation Zone, Wilderness Zone and Seasonal Closure Zone (covering the Nassau Grouper spawning aggregation area), each zone having regulations defining activities that can and can’t be done. The spawning aggregation site at north east Glover’s is also designated under a separate legislation (SI 162 of 2003) that provides protection for all the key identified spawning aggregation sites in Belize.
The protected area is considered to be within the IUCN Category IV – a Habitat/Species Management Area, with active management targeted at conservation through management intervention (IUCN, 1994). The Marine Reserve has clear zones embedded in the legislation that allow for extractive / non extractive use, and conservation protection, with use concentrating on fishing, tourism, and research.

Management responsibility for Glover’s Reef Marine Reserve is held by the Fisheries Department, which has established a staffed Fisheries Base on Middle Caye for site-level management of the area.

The Wildlife Conservation Society provides assistance to the Fisheries Department through collaborative research and monitoring activities, and hosts the Fisheries Base on Middle Caye. An active Advisory Committee assists the Fisheries Department with management recommendations, and is composed of representatives from the major stakeholder components.

**SITE INFORMATION**

- **Size:** 86,653 acres (35,067 ha)
  - Wilderness Zone 667 acres (270 ha)
  - Conservation Zone 17,488 acres (7,077 ha)
  - General Use Zones 64,668 acres (26,170 ha)
  - Seasonal Closure Zone* 3,830 acres (1,550 ha)
  - Spawning Aggregation* 1,779 acres (720 ha)
- **Statutory Instrument:** SI 137 of 2001
  - Original SI: SI 38 of 1993
  - Spawning Aggregation Site: SI 162 of 2003
- **IUCN Category:** IV
- **Management Authority:** Fisheries Department
- **Contact E-mail:** species@btl.net
- **Web site:** www.gloversreef.org

**Location:** Glover’s Reef Marine Reserve is located on the most southern of the three atolls that form part of the Barrier Reef System, and lies approximately 45 kilometres east of the Belize mainland (75km southeast of Belize City)

**Uses:** Extractive and Non-extractive – fishing, tourism, education and research
**Management Plan:** 2008 - 2013
**Biodiversity Information:** Wildlife Conservation Society is based on Middle Caye, and has ongoing and long term research projects in the Marine Reserve
**Facilities:** Ranger’s Station
**Visitation (2008):** 2,338
**Site Staff:** 1 site manager, 2 rangers, 1 biologist

* Seasonal Closure Zone and spawning aggregation site partially overlap the General Use Zone

**Neotropical Migratory Birds**

As with the other Atolls of Belize, Glover’s Reef is considered important as a migratory bird stopover refuelling point. Many thousands of migrants that have meandered off course end up on the Atoll cayes every spring and fall. Glover’s Reef is used as part of a straight line migration path down the Yucatan Peninsula coastline, through Ambergris Caye and then to Lighthouse Reef, Glover’s Reef, and Sapodilla Cayes, and from there to Guatemala and Honduras, where they again hook up with the mainland and its more extensive resources.
Hol Chan Marine Reserve

Hol Chan Marine Reserve is located about four miles south of San Pedro, on Ambergris Caye. The Marine Reserve encompasses 13,632 acres (5,517 ha) of ecologically linked coral reef, sea-grass meadows and coastal mangrove swamp habitats and is centered on the Hol Chan Channel (“Little Channel”), a natural break in the barrier reef. Combined with the associated Shark Ray Alley, where snorkelers can swim with congregations of nurse sharks and stingrays, this forms one of the most popular day trips in Belize.

Physical Features

The protected area lies on a submarine extension of the Yucatan Platform, a drowned low-relief limestone platform that forms the reef lagoon, stretching from the Belize coastline to the reef crest and drop off. The Marine Reserve itself includes part of this platform, extending to the fore-reef, Boca Ciega, a collapsed sink hole and associated cave system within Zone C, being characteristic of this limestone landscape. It also includes the Hol Chan Channel, with a width of 23m and near vertical sides that drop to a depth of 10m.

The Marine Reserve is divided into four zones, Zones A, B, and C each representing a specific ecosystem, and Zone D covering Shark Ray Alley:

Zone A: Coral Reef (non-extractive) 640 acres (259 ha)
Zone B: Sea-grass Beds (multiple use) 5,376 acres (2,176 ha)
Zone C: Mangroves (multiple use) 6,336 acres (2,564 ha)
Zone D: Shark Ray Alley (multiple use) 1,280 acres (518 ha)

In October 2008, the reserve was expanded to include all the area to the south, including Cangrejo Caye, to stretch from the southern tip of Ambergris Caye to a half km past the last mangrove caye.

Biodiversity

Whilst Hol Chan Marine Reserve is more important for its touristic value than for its relative contribution to the conservation of marine resources in Belize, it still maintains representative populations of marine species, and protects a continuum of ecosystems from the mangroves to the reef drop. The presence of impressive shoals of large fish also provides proof of the functionality of marine protected areas.

Fore-reef, reef crest, back reef, and reef lagoon are all represented, as well as the connection between reef, sea-grass and mangrove ecosystems, so important for different life stages of many species. The highly developed spur and groove formations, combined with the large fish, healthy corals and ease

SPECIES OF INTERNATIONAL CONCERN

**Critically Endangered**
- Staghorn Coral: Acropora cervicornis
- Elkhorn Coral: Acropora palmata
- Hawksbill Turtle: Eretmochelys imbricata
- Goliath Grouper: Epinephelus itajara

**Endangered:**
- Loggerhead Turtle: Caretta caretta
- Green Turtle: Chelonia mydas
- Nassau Grouper: Epinephelus striatus
- Star Coral: Montastraea annularis
- Star Coral: Montastraea faveolata

**Vulnerable**
- Rainbow Parrotfish: Scarus guacamaia
- Queen Triggerfish: Balistes vetula
- Hogfish: Lachnolaimus maximus
- Cubera Snapper: Lutjanus cyanopterus
- Mutton Snapper: Lutjanus analis
- West Indian Manatee: Trichechus manatus

HCMR Management Plan, 2002 / IUCN, 2010
of accessibility have led to this being one of the primary tourism destinations in Belize.

Shark Ray Alley provides a tourism resource centred on a congregation area for habituated nurse sharks and southern stingrays that gather to be fed. The mangrove cayes support good populations of all three species of mangroves and of their mangrove associates.

Landscape Context

Hol Chan Marine Reserve is part of the Belize Barrier Reef and therefore the larger Mesoamerican Reef, and plays a role in the protection of commercial and non-commercial species. Of more importance within the local landscape, however, it provides substantial employment opportunities for local guides and tourism developments in stakeholder communities – primarily San Pedro and Caye Caulker, but also Belize City, and increasing visitation is becoming a growing concern. Also of concern is potential trans-boundary contamination from Corozal Bay / Chetumal Bay, a large estuarine system that enters the reef in the general area of Hol Chan. Partial protection is offered by the presence of Bulkhead Shoals, at the south end of Corozal Bay Wildlife Sanctuary, where shallow waters act as a sediment trap.

History of Establishment

Hol Chan Marine Reserve was established as the first marine protected area in Belize, in July 1987, following ongoing recommendations for its protection from international NGOs (primarily FAO and New York Zoological Society) and local stakeholders since the early 1960’s. In 1999, Shark Ray Alley, a very popular tourism resource in the adjoining sea grass and reef area south of the Reserve, was included to provide protection for the sharks and rays that gather at the feeding point. Since its establishment, the Marine Reserve has been expanded to include mangrove cayes threatened by development.

Management Regime

Hol Chan Marine Reserve is under the jurisdiction of the Fisheries Department of the Ministry of Agriculture and Fisheries, with the establishment of a Board of Trustees in 1994 for the ‘purpose of directing and managing the affairs of the Reserve’ (SI 170 of 1994). As a Marine Reserve, it is managed for a combination of regulated extractive and non-extractive uses. It falls under IUCN Category II (a habitat management area managed mainly for conservation through management intervention).

The Marine Reserve allows for extractive and non-extractive use, with Zone A being non-extractive, but Zones B, C and D (excepting the localized areas of Shark Ray Alley and Amigos del Mar Dive Wreck) allowing recreational and commercial fishing under special license from the Fisheries Administrator.

SITE INFORMATION

Size: Total: 13,632 acres (5,517 ha)
Statutory Instrument: SI 116 of 2008
  Original SI: SI 57 of 1987
  Regulations: SI 107 of 1988
  Amendment: SI 101 of 1999
  Amendment: SI 114 of 2008
  Amendment: SI 116 of 2008
  Establishment of Board of Trustees: SI 170 of 1994
IUCN Category: II
Management Authority: Fisheries Department / Hol Chan Trust Fund
Contact E-mail: species@btl.net or hcmr@btl.net
Location: Hol Chan Marine Reserve is located at the south end of Ambergris Caye, in northern Belize, approximately 4km south of the town of San Pedro
Uses: Extractive and non-extractive – recreational and commercial fishing (under special license), tourism, education and research
Management Plan: 2002 (Young et. al.)
Biodiversity information: Information is available within the management plan (Young et. al., 2002). Ongoing monitoring by Hol Chan staff.
Facilities (2009): Hol Chan Office / Visitor’s Centre (San Pedro)
Visitation (2008): 66,908 visitors
On-site Staff (2009): 2 rangers on site, supported by a site manager, biologist and administrative staff based on San Pedro
Port Honduras Marine Reserve

Port Honduras Marine Reserve, in the southern coastal waters of Belize, is a semi-estuarine system that stretches from Monkey River to beyond Rio Grande, extending approximately 8 kilometres out to sea. It contains a diverse set of ecosystems – coastal and tidal wetlands, coral reef, extensive sea-grass and mangrove, but excludes the approx 140 cayes lying within the overall area. An important resource for local fishermen, the Marine Reserve has also been highlighted for its relatively high value as a fish nursery area, and its role in maintaining the viability of local manatee populations.

Physical Features

The Marine Reserve lies in a coastal basin with estuarine characteristics, into which six watersheds flow. Although much of the Reserve waters exceed 5m in depth, two shallow banks run parallel to the shore, providing a base for many of the cayes, and which act as sediment traps, preventing much of the riverine sediment from reaching the coral reefs. Close inshore the water are generally quite turbid, beyond the shallow banks the water has far greater clarity.

The waters of the Marine Reserve exhibit pronounced haloclines – layering of waters with different concentrations of salinity. This vertical layering of the water column is particularly pronounced in areas where the rivers enter the Bay, with the less dense surface waters from the rivers lying on top of the denser seawater. Mixing of these layers is limited by the shallow banks, protecting the inshore waters from significant offshore wave-action, and salinity can vary from freshwater to over 30 ppt.

Biodiversity

Port Honduras Marine Reserve is considered important in its protection of significant fisheries, mangrove communities, coastal and tidal wetlands, birds, manatees, sea turtles and reef. The coastline is fringed by mangroves, which provide important ecosystem functions, including the provision of high levels of organic input to the system, the filtering of water as it enters the Marine Reserve, and the provision of an important habitat for prop root communities.

The Marine Reserve does not include the 138 cayes lying within the overall area, the majority of which remain undeveloped and provide important mangrove habitats for fish nurseries. Some are used by birds for nesting – magnificent frigatebirds, brown pelicans, and sooty terns among them, and hawksbill turtles are known to use the beaches of the Snake Cayes as nesting sites. Some mangrove clearance has taken place, posing sedimentation threats to the reserve. The extensive sea-grass beds surrounding many of the cayes (and being part of the reserve) are considered to provide critical nursery habitat for many commercial and non-commercial marine species, and important feeding grounds for the West Indian manatee. In the waters surrounding the Snake Cayes, near-shore fringing reefs provide habitat for reef organisms. These are unique in Belize as mid-lagoonal reefs, with characteristics of both inshore reef and offshore barrier reef environments. These reef areas underwent extensive bleaching in 1998, losing up to 40% of coral cover, but have since recovered.
As an integral part of the Maya Mountain Marine Corridor, the Port Honduras Marine Reserve focuses on the conservation of marine biodiversity, with connectivity to the landscape through the six watersheds that empty into it. This landscape includes the coastal wetlands, the matrix of private protected areas managed under TIDE and Ya’axché Conservation Trust, and the mosaic of mangrove, lagoon and savannas of Payne’s Creek National Park.

The functions of the coastal basin and the extensive sea-grass beds in filtering and settling out sediments and nutrients is critical for maintaining the health of the barrier reef – particularly that of the adjacent Sapodilla Cayes Marine Reserve, one of Belize’s seven protected areas that, combined, form the Belize’s World Heritage Site.

The Port Honduras area has only limited human settlement on its shores, concentrated primarily in Punta Gorda, the district capital, and the much smaller coastal community of Punta Negra. The predominant use of the coastal waters has traditionally been fishing, with a shift to tourism as Toledo has developed recognition as a tourism destination. Of much greater impact recently have been the fishing incursions by residents of Honduras and Guatemala, with increased pressure on finfish, conch and lobster, as well as overharvesting of sea cucumbers.

Also of concern is the high probability of development occurring on the cayes within the marine protected area, with the associated loss of mangrove habitat, and impacts of sedimentation and reduced water quality.

The Marine Reserve was established in 2000, following a number of studies that demonstrated its importance for its unique values and in terms of national requirements for biodiversity protection (BCES, 1990).

Port Honduras Marine Reserve is managed by the Toledo Institute for Development and Environment, in partnership with the Belize Fisheries Department, the administrative body.

It is considered equivalent to IUCN Category IV: an area of sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.
Sapodilla Cayes Marine Reserve, part of Belize’s Barrier Reef World Heritage Site, is the most southern of the marine protected areas in Belize, and encompasses the southern-most tip of the Belize Barrier Reef. Covering an area of 38,595 acres (approximate 15,619 ha), the Marine Reserve surrounds fourteen privately-owned palm-fringed sand or mangrove cayes, some considered to be among the most scenic within Belize.

The distinctive hook-shaped reef structure forms the end of the Belize Barrier Reef, and is unique within the Caribbean region (Kramer and Kramer, 2002). Here, coral biodiversity is at its highest in Belize, although impacts from increasing visitation and from agricultural runoff from the coastline to the south are thought to be reducing the viability of the coral and its ability to recover following bleaching.

The littoral forest provides an important connectivity point for migrating birds, as they travel south to their wintering areas, whilst the sandy beaches attract both nesting turtles and human visitors, the latter accessing the area from Punta Gorda as well as from communities on the Guatemalan and Honduran coastline.

**Physical Features**

The reef structure is considered geomorphologically unique in this region as the area lies on a fault line and has been shaped by the influence of tectonic activity. The outer portion of the reserve is characterized by shallow water reefs which occur as a fringe around the cayes, with water depths often less than 15 feet. The drop-off east of the cayes is gently sloping, in contrast to the near vertical walls further north and surrounding the outer coral atolls. The lagoon area is characterized by silt, sand and shallow sea-grass beds.

Hunting Caye provides a base for the reserve staff, and a research facility for the University of Belize and visiting students and researchers. Also based here are staff of Fisheries Department, and an outpost of the Belize Defence Force/Coast Guard.

**Biodiversity Evaluation**

The Sapodilla Cayes Marine Reserve has been designated as one of seven components of the Belize Barrier Reef Reserve System - World Heritage Site, in recognition of the uniqueness of its contribution to Belize’s reef
system. The waters of the Marine Reserve provide protection for at least twenty three species of international concern, recognized under the IUCN Red List as Critically Endangered, Endangered or Vulnerable (IUCN, 2010), including five species of coral, three species of turtle, fourteen species of fish and the vulnerable West Indian manatee. A number of the cayes have been highlighted for their historical importance in provided nesting sites for Hawksbill and Green Turtles, important to the survival of these species within the region. Whilst nesting populations are currently considered to be stable, they are greatly reduced compared to historical records.

The Marine Reserve is considered a high ecoregional priority (Kramer and Kramer, 2002), with its unique reef formation and the high diversity of species in the area. Also adding to its importance is the presence of three spawning aggregation sites (Nicholas Caye, Rise and Fall Bank and Seal Caye), important for the Nassau Grouper, and for the national and regional viability of several commercial fish species, though the general trend of spawning populations at the aggregation sites is considered to be decreasing.

The cayes, whilst privately owned and, to a lesser or greater extent, developed, still support some mangrove, littoral forest and herbaceous beach vegetation, important for migratory birds.

Landscape Context

Sapodilla Cayes Marine Reserve lies within the Mesoamerican Barrier Reef System, and is a component of the system-level management unit of the Southern Belize Reef Complex, a seascape planning unit that also includes South Water Caye, Gladden Spit and Silk Cayes Marine Reserves and Laughing Bird Caye National Park.

The Sapodilla Cayes have long been used by Guatemalans, Hondurans and to a lesser extent by Belizeans for swimming, snorkelling, diving and fishing. Despite their remoteness, these cayes are easily accessible by sea, and there is increasing tourism visitation from Punta Gorda. There is also ongoing annual visitation by small cruise ships, with some facilities in place.

Tourism and commercial fishing stakeholders form the main stakeholder components using the Sapodilla Cayes. Whilst fishing has been declining due to unsustainable practices, tourism is becoming increasingly important in generating income for the Toledo District, considered to have the highest level of poverty in Belize. Local fishermen from Monkey River, Punta Negra and Punta Gorda have been operating within the reserve area from temporary camps on the cayes for approximately 30 years. Whilst the Sapodilla Cayes were once considered a prime fishing area, illegal fishing activity by Belizean and foreign fishermen has resulted in catches in the area being reduced significantly (Nightingale, 2001).
The Sapodilla Cayes Marine Reserve was first officially declared through Statutory Instrument 117 of 1996 under the Fisheries Act (Amended 1983), as part of its inclusion in the designation of Belize’s World Heritage Site. The area was also highlighted by the Sea Turtle Recovery Action Plan (Smith et al. 1992), which pushed for the protection of the area due to its critical importance for Hawksbill Turtle nesting. This has more recently been revised (SI 50 of 2009) to update the management zones for the area.

The Marine Reserve has clear zones embedded in the legislation that allow for extractive / non-extractive use and conservation protection, with use concentrating on tourism, research, education and sustainable fishing. Since the signing of the first co-management agreement in February 2001 with the Toledo Association for Sustainable Tourism and Empowerment (TASTE), management has been through collaboration with Fisheries Department. More recently, following an amalgamation of TASTE and Friends of Nature to form the Southern Environmental Association (SEA), management has been between Fisheries Department and SEA, with SEA being responsible for day-to-day management of the reserve, including activities such as patrols and fee collection and scientific monitoring.

**Lionfish Invasion**

The lionfish (*Pterois volitans*), a highly invasive species, was first reported in Belize in 2008, at Turneffe Atoll. Believed to have originated from escapees in Florida, this species has been spreading through the Caribbean, and was first reported from SCMR in late 2009. Numbers have increased exponentially, with concerns for local fish stocks. This species, a voracious predator, is now found in reef, seagrass and mangrove habitats, feeding on juvenile fish of almost all species, including the commercially important grouper and snapper, as well as parrotfish, key herbivores that help to prevent algal build-up on the reef.
South Water Caye Marine Reserve

South Water Caye Marine Reserve, with its exceptional barrier reef structure, sheltered, clear waters and dazzling array of corals, is the largest Marine Reserve in Belize, covering an area of 117,875 acres (approximately 47,700 hectares). The area is of particularly high ecological value, and has high touristic and educational value, with easy access and caye-based accommodation attracting many divers, snorkelers and student groups. A number of research and education facilities are also located in the area, including the long term Smithsonian Institute research facility at Carrie Bow Caye.

Physical Features

The physical characteristics of the Marine Reserve are highly complex, ranging from the 9km stretch of almost unbroken barrier reef in the north, lying on the first of three fault line escarpments that run parallel to the coast of Belize, to the maze of patch reefs, faros, and pinnacles in the south. The inner-reef platform is dotted with numerous cayes, some formed on mangrove peat, others from coral outcrops and sand deposition. In the southeast of the protected area lie hundreds of sand bores, some of which break the surface, rising from water depths of 15m and are generally separated by narrow, deep channels 20 to 30 meters across.

This complexity is driven in the south by karstic processes, which impacted the underlying limestone when the area was exposed by lower sea levels, resulting in the unusually steep-sided faros in the Pelican Cayes area. The Victoria Channel in the south connects to the Inner Channel in the vicinity of Crawl Caye, and with depths of between 30 to 44m, gives deepwater frontage to the Pelican Cayes and other sand and mangrove cayes.

Biodiversity Evaluation

The Marine Reserve has been highlighted as an ecoregional conservation priority for its particularly rich biodiversity (Kramer and Kramer, 2002; Arrivillaga et. al, 2008), and as such, is included as a component of Belize’s World Heritage Site.

The northern section of Barrier Reef running from Tobacco Caye to South Water Caye is considered one of the most highly developed examples of barrier reef structure in the region, with extensive spur and groove formation (Kramer and Kramer, 2002). The sheltered waters and oceanic mangrove systems of the Pelican Cayes in the southern area of the Marine Reserve have been identified as one of the most diverse marine
systems within the western hemisphere, supporting a number of endemic species, and species new to science (Smithsonian CCRE Reports, 1997 - 2007).

The shallow northern back-reef lagoon between the reef crest and Tobacco Range supports nationally important nursery areas for the queen conch, whilst the mangroves of Twin Cayes, Tobacco and Blue Ground ranges, and the Pelican Cayes are considered particularly important for the sustainability of commercially important species for the entire reef system – not just the Marine Reserve itself. The mangroves and sea-grass beds provide critical nursery habitat for juvenile Caribbean spiny lobster and many commercial finfish species, forming the foundation of Belize’s fishing industry.

The Marine Reserve is also of great importance for many species of international conservation concern, including the critically endangered hawksbill turtle \( (Eretmochelys imbricata) \) and goliath grouper \( (Epinephelus itajara) \), and the endangered green and loggerhead turtles \( (Chelonia mydas \) and \( Caretta caretta) \) (IUCN, 2008). A number of the cayes have historically provided nesting sites for hawksbill and green turtles, though in recent years, tourism developments have severely reduced the size and suitability of these beaches. Several bird nesting colonies are also located within the boundaries of the marine reserve, including Man O’ War Caye, a crown reserve in its own right, and a colony nesting site for both the magnificent frigatebird \( (Fregata magnificens) \) and the brown booby \( (Sula leucogaster) \). The many exposed reef and sand cayes also provide nesting sites for several tern species - bridled terns \( (Sterna anaethetus) \), least terns \( (Sterna antillarum) \) and roseate terns \( (Sterna dougallii) \) among them.

### Landscape Context

South Water Caye Marine Reserve is a priority area of the regional Mesoamerican Barrier Reef System, and at national level has a significant impact on both the traditional lobster and conch capture fisheries and increasing local tourism industry.

The General Use Zone is utilized by fishermen from the coastal communities of Sarteneja, Dangriga, Hopkins, Riversdale and Placencia. Fishermen target finfish, spiny lobster \( (Panulirus argus) \) and queen conch \( (Strombus gigas) \), free diving throughout the shallow protected lagoon or using long lines in the deeper channels and on the fore-reef, especially near
Tobacco Caye. The importance of South Water Caye Marine Reserve to the national conch stocks is well documented with high densities of juvenile conch reported in 2006 and 2007 reflecting the presence of extensive conch nursery areas in the shallow northern back-reef areas.

Whilst there are no permanent communities within the Marine Reserve, the cayes have a long history of use as recreational retreats by local coastal communities as far back as the early 1900's. This use for recreation continues today, and the Marine Reserve provides substantial employment opportunities through tourism and tourism developments, both within the Marine Reserve and in Dangriga, Hopkins and Sittee River.

**History of Establishment**

South Water Caye Marine Reserve was originally established in 1996 (SI 118 of 1996) in recognition of the exceptional integrity of the marine ecosystems, and its national, regional and international importance. This was further strengthened by its inclusion in the Belize Barrier Reef Reserve System World Heritage Site. The statutory instrument has recently been revised (SI 50 of 2009) to strengthen zoning and include nationally-owned cayes that lie within the Marine Reserve.

**Management Regime**

The Marine Reserve combines regulated extraction and non-extractive uses, “...for the protection, wise use, understanding, and enjoyment of the natural resources of South Water Caye Marine Reserve in perpetuity”. Management responsibility is held by the Fisheries Department, under the Protected Area Management Programme. An active Advisory Committee assists Fisheries Department with management recommendations, composed of representatives from the major stakeholder components.
Private Protected Areas

Black Howler Monkey
Community Baboon Sanctuary
Officially Recognized Private Protected Areas

Seven private protected areas (PPAs) are currently recognized as part of the National Protected Areas System. Of these, Aguacate Lagoon was the only non-participatory PPA, the management group expressing little interest in being part of the National Protected Areas System.

<table>
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<tr>
<th>Private Reserves</th>
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<tr>
<td><strong>Name</strong></td>
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<tr>
<td>Community Baboon Sanctuary</td>
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<tr>
<td>Golden Stream Corridor Preserve</td>
</tr>
<tr>
<td>Monkey Bay Wildlife Sanctuary</td>
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<tr>
<td>Rio Bravo Conservation &amp; Management Area (RBCMA)</td>
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<tr>
<td>Runaway Creek</td>
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<tr>
<td>Shipstern Nature Reserve</td>
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<tr>
<td>TIDE Block 127</td>
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It should be noted that whilst some of these recognized Private Protected Areas have no formal or legal commitment to remain under conservation management, there are other private landholdings which are critical to the National Protected Area System, are considered to be extremely effective in biodiversity conservation (e.g. the Gallon Jug property) and which are not yet recognized within the system. Formal adoption and implementation of proposed legislation, to govern and regulate private protected areas, should normalize these inconsistencies.
The Community Baboon Sanctuary is a community initiative that was established to protect the Yucatan black howler monkeys (known as ‘baboons’ in Creole) of the Bermudian Landing area, whilst also promoting sustainable tourism within the Belize River Valley communities. Over 200 private landowners from eight villages have pledged to use sustainable land use practices, including conserving the forested edges of their lands, to provide connectivity for the howler monkeys.

**Physical Features**

The Community Baboon Sanctuary lies within the Belize River Watershed, on the northern Yucatan platform, and follows the course of the river through the human and natural landscape. The alluvial soils provide fertile farmland for the communities that lies within the flood plain.

The Sanctuary includes a matrix of ecosystems, including agriculture and communities, with riverine forest along the Belize River itself.

**Communities of the Community Baboon Sanctuary**
- Big Falls
- St. Paul’s
- Willow’s Bank
- Double Head Cabbage
- Bermudian Landing
- Isabella Bank
- Scotland
- Half Moon
- Flowers Bank

**Community Baboon Sanctuary: Human Landscape Context**

Elevation: 0m - 25m above sea level
Geology: Miocene - Pleistocene limestone
Annual Rainfall Regime: 80 - 100” (2032 – 2540mm)
The Sanctuary boasts the highest density of the Endangered Yucatan black howler monkey in Belize, and was established primarily to provide an environment in which both humans and the Yucatan black howler monkey can co-exist, with limited conflict. The black howler monkey (*Alouatta pigra*) is found only in Belize, southern Mexico and north eastern Guatemala, and is listed as Endangered (IUCN, 2010), with the species population declining through habitat loss and capture for the pet trade.

This species is characteristically found in the riparian forests of river banks, and much of the outreach and management actions are focused on the protection of habitat connectivity for the, the focal species – primarily within the riparian forest along the Belize River, on which the Reserve is centred. The Sanctuary encompasses five habitats along the banks of the river, including short-grass savanna, pine savanna, disturbed shrub-lands, broadleaf riparian forest on alluvial soils and broadleaf forest on calcareous soils (the central-eastern variant). The reserve also includes active agriculture, with landowners being committed to leaving trees for monkey foraging and movement.

The forested and riparian ecosystems set aside for the howler monkeys also provides habitat for other species, such as the green iguana, white-lipped peccary and Morelet’s crocodile. The critically endangered Central American river turtle still occurs within the reserve, as does the endangered Baird’s tapir and vulnerable mahogany and Spanish cedar. Approximately 250 species of birds have been recorded in the Reserve. The endangered yellow-headed parrot is characteristic of the pine forests, and enters the communities when fruit trees are producing.
The Sanctuary encompasses a patchwork of ecosystems – both natural and anthropogenic, running along both sides of the Belize River. It is considered an important link within the Mesoamerican Biological Corridor, in the maintenance of forested corridors, as well as a model for community grass roots collaboration towards conservation and sustainable development.

History of Establishment

Bermudian Landing has long been a focus of primate researchers, particularly Rob Horwich. This interest was the initial driving force behind the establishment of the Community Baboon Sanctuary, through voluntary commitments, signed by local private landowners, and with financial and capacity building assistance from outside organizations.

Management Regime

The current body overseeing the Community Baboon Sanctuary is the Women's Conservation Group. Management of each private parcel within the Sanctuary is voluntary, and focused on maintenance of forest by the Belize River and tributary streams, and between fields, providing forest connectivity for the howler monkeys.

The Yucatan Black Howler Monkey

The Yucatan black howler monkey (Alouatta pigra), endemic to a small area of the Yucatan Peninsula, Belize and the Peten, is listed as Endangered (IUCN, 2003), with this species expected to experience a decline approaching 60% over a period of three generations (30 years), based on past and current rates of habitat decline and continued hunting for food and capture for pets.

In Belize, Black howler monkeys were decimated by a yellow fever epidemic in 1956/1957 that swept through the population throughout most of the Country. With the increasing human footprint, fragmentation of forest, loss of forest connectivity and hurricane impacts from Hurricane Iris in 2001, the recovery of this species has been slow.
Block 127

Block 127, an 9,232 acre parcel owned, managed by the Toledo Institute for Development and the Environment (TIDE), provides a critical link within the Golden Stream Corridor, lying between the Golden Watershed Corridor Preserve, (managed by Ya’axché Conservation Trust), and the Port Honduras Marine Reserve (managed by TIDE), maintaining connectivity and watershed functionality between the Maya Mountains Massif and the barrier reef.

**Physical Features**

Block 127 is situated on the flat, southern coastal plain of the Toledo District, and extends inland from the coastline. The western boundary follows the lower reaches of the Golden Stream, whilst the southern boundary follows the coastline.

**Biodiversity**

The area has a combination of sand and calcareous soils supporting a range of lowland ecosystems, transitioning from the lowland evergreen broadleaved forest to the mixed mangrove scrub and riverine mangrove of the coastal zone. It includes much of the southernmost riverine forest of the Golden Stream on its western boundary, with pine stands on the sandier soils to the east, and a large, brackish inundation area in the coastal red mangrove flats.

The area is important for maintaining the connectivity along the watershed, providing habitat for species such as collared and white-lipped peccary, and Baird’s tapir, as well as the larger cat species – both jaguar and puma. The West Indian manatee (listed as Vulnerable, IUCN, 2010) is known to enter the lower reaches of both the Deep River and the Golden Stream.

**SPECIES OF INTERNATIONAL CONCERN**

- **Critically Endangered**
  - Central American Dermatemys mawii River Turtle (Hickatee)*
- **Endangered**
  - Yucatan black howler monkey Alouatta pigra
  - Yellow-headed parrot Amazona oratrix
  - Baird’s tapir Tapirus bairdii
  - Giant spotted zamia Zamia variagata

*IUCN, 2010

*Possibly no longer in Block 127
Block 127, the first of TIDE’s series of Private Protected Lands (PPL), plays a critical role in the functionality of the Golden Stream Corridor, providing the final connectivity between the adjacent Ya’axché Conservation Trust’s Golden Stream Corridor Preserve to the north and the marine environment of Port Honduras Marine Reserve to the south-east. The southern boundary stretches from the mouth of the Golden Stream to the mouth of Deep River, connecting the Golden Stream Corridor with the adjacent Payne’s Creek National Park and Port Honduras Marine Reserve.

**History of Establishment**

Block 127 is one of a series of lands privately owned by TIDE, and purchased and protected in 2001 to maintain ridge-to-reef connectivity. Originally Crown Land, it was acquired from Government through a Debt for Nature Swap with the U.S. government via the U.S. Tropical Forest Conservation Act, and assisted by the Nature Conservancy.

**Management Regime**

Block 127 is managed as a private protected area by the Toledo Institute for Development and Environment. It is considered equivalent to IUCN Category IV: an area subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.

**The West Indian Manatee**

The Belize coast is home to the largest population of West Indian manatee in the Caribbean, with a population estimated at between 800 and 1,000 individuals (Auil, pers. com.), although the population size may now be falling as a result of significantly increased impacts from boat traffic. Historically the manatee has been hunted for meat, with bone middens discovered on archaeological sites, and in the 17th century, it was taken to provide food for privateers and explorers (Self-Sullivan and LaCommare, 2004). Today, the Antillean manatee is considered threatened throughout its range, and is listed as ‘Vulnerable’ (IUCN, 2008), but is fully protected under the Wildlife Act.

Belize has established a Marine Mammal Stranding Network to provide rapid response to manatee strandings, with orphaned calves cared for at the Manatee Rehabilitation Centre.
The Golden Stream Corridor Preserve (GSCP), situated in Toledo District, is a 14,970 acre private protected area located within the system-level Maya Mountain Marine Corridor (MMMC) management unit. The protected area encompasses one of the few remaining expanses of rare lowland tropical broadleaf forest and serves as a vital conservation corridor linking the extensive, intact forests of the Maya Mountains Massif to the north, through the TIDE Private Land Block 127 to the south-east, and to the Port Honduras Marine Reserve, part of the Mesoamerican Reef. The protected area not only protects many endangered, critical, and endemic species of flora and fauna, but is also a functional corridor, with mammals and birds of the limestone uplands moving along the riparian and forest corridor during dry season, seeking water. It is also important as an instrument of biological exchange between Belize’s terrestrial and marine ecosystems.

**Physical Features**

The Golden Stream Corridor Preserve is located along the Golden Stream River, one of seven watersheds that disburse into the Port Honduras Marine Reserve, part of the Mesoamerican Reef. Of the various watersheds located within the MMMC, the Golden Stream Watershed is widely considered to be the highest priority, not only because of the critical biodiversity it contains, but also because it has the greatest potential to function as a viable demonstration of a working conservation corridor. The freshwater and nutrients of the forested Golden Stream Watershed feed into the mangrove forests and sea grasses of the coast, thus integrating these globally significant terrestrial and aquatic ecosystems.

The GSCP lies within the southern Belize Basin, an eastern continuation of the southern Petén Basin of Guatemala. The oldest rocks within the protected area are white to light grey limestone that outcrop as ridges and hills in the westernmost part of the reserve, uplifted along a Northeast – Southwest trending reverse fault. Extending east of this fault all the way to the coast, the landscape surface is composed of a complex matrix of sedimentary rocks - siltstones, sandstones and conglomerates. The fault boundary formed between the older limestone and more recent conglomerates is thought to be the result of the impact of a meteor in the northern Yucatan.

**Biodiversity**

Reinforcing its significance as a critical biological corridor, the GSCP provides protection to 17 identified major ecosystems which support an abundance of floral and faunal diversity. In addition to the 147 plant species so far identified, there are also a reported 19 amphibian, 20 fish, and 54 reptile species. Over 300 species of bird have been recorded on the property, many of which rely on the protected area for critical breeding or migration resources. The preserve provides food, shelter and protection for at least 59 mammal species, including the endangered Central American spider monkey and Baird’s tapir, as well as other characteristic species of the forested lowlands. The Critically Endangered Central American river turtle (the ‘hickatee’) has been recorded in the Golden Stream, though recent surveys did not show conclusive proof that it still exists here. The Vulnerable West Indian manatee has also been recorded from the protected area, entering the Golden Stream occasionally, in search of fresh water.

**SPECIES OF INTERNATIONAL CONCERN**

<table>
<thead>
<tr>
<th>Critically Endangered</th>
<th>Dermatemys mawii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central American River Turtle</td>
<td>Amazona oratrix</td>
</tr>
<tr>
<td>(Hickatee)</td>
<td>Zamia variegata</td>
</tr>
<tr>
<td>Endangered:</td>
<td>Tapirus bairdii</td>
</tr>
<tr>
<td>Yucatan black howler monkey</td>
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<tr>
<td>Yellow-headed parrot</td>
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<tr>
<td>Zamia sp.</td>
<td></td>
</tr>
<tr>
<td>Baird’s tapir</td>
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</tbody>
</table>
Landscape Context

The Golden Stream Corridor Preserve forms part of a strategic, biological corridor with the more southerly Tide Block 127, linking the steep forested slopes of the Maya Mountains to the vital mangrove coasts of southern Belize and plays a critical role in protecting the Golden Stream watershed, reducing negative impacts on the Port Honduras Marine Reserve. The Golden Stream Corridor Preserve is part of a larger landscape – the Maya Golden Landscape, consisting of both protected and non-protected lands. To the north lie the protected areas of the Maya Mountain Marine Corridor, including the Columbia River Forest Reserve, Bladen Nature Reserve and Deep River Forest Reserve. The Golden Stream itself, protected by GSCP, ultimately feeds into the Port Honduras Marine Reserve to the southeast, the link to the coastal ecosystems being formed by the TIDE Block 127. This private protected area, managed by TIDE, is also contiguous with Payne’s Creek National Park, maintaining the important coastal mangroves of Port Honduras Marine Reserve.

The Golden Stream Corridor Preserve is not untouched by local human presence. The Southern Highway bisects the protected area from the northeast boundary for approximately 4 km to the Golden Stream River. The buffer communities include the Mopan and Kekchi communities of Golden Stream, Indian Creek, and Medina Bank. The people of these villages are still dependent on the resources of the reserve for their livelihoods and survival, such as food, shelter, and medicine. They also rely on the maintenance of a healthy forest and watershed for environmental services and ecological processes, including clean air and water.

History of Establishment

The Golden Stream Corridor Preserve consists of a series of private properties held and managed by Ya’axché Conservation Trust since its inception in 1998. The purchase of these lands was catalysed by the Mesoamerican Biological Corridor programme (MBCP) in 1998, with its designation as the south-eastern node of the MBC system in Belize. The first 9,554 acre (3,386 ha) parcel of the Golden Stream Corridor Preserve was purchased with support from Fauna and Flora International’s (FFI) Arcadia Fund. The second ‘Manatee Creek’ parcel was bought in March 2004 and funded jointly by FFI’s Arcadia Fund and the Grassvalley Foundation from the Channel Islands, UK, increasing GSCP’s area by 5,416 acres (2192 ha), to a total of 14,970 acres (6,058 ha). GSCP was formally recognized as an integral part of Belize’s protected area system by the Ministry of Natural Resources and the Environment in 2002.
The GSCP is a private protected area owned and managed by Ya’axché Conservation Trust, based on an integrated landscape management approach, which focuses on balancing social and economic issues equally with those of conservation. Overall, the management of the GSCP falls primarily under its sustainable land-use management programme which focuses on the 302,258 acre Maya Golden Landscape. In this, it is supported by community outreach and livelihood, advocacy and institutional governance and management programmes. Ya’axché is governed by a seven member Board of Directors (BoD). Three of the seats on the Board are filled by a representative from each of the three primary communities with which Ya’axché works.

### SITE INFORMATION

- **Size:** 14,970 acres (6,058ha)
- **Date of Establishment:** 1998
- **IUCN Category:** II
- **Management Authority:** Private
- **Management Body:** Ya’axché Conservation Trust
- **Contact E-mail:** info@yaaxche.org
- **Web site:** www.yaaxche.org

**Location:** Golden Stream Corridor Preserve is located on the southern coastal plain in the south of Belize, in Toledo District, stretching from the Maya Mountains towards the southern coast, along the Golden Stream.

**Uses:** Non-extractive – education and research; Extractive- local sustainable harvest

**Management Plan:** In prep (2010)


**Facilities (2010):** Field station, nursery, greenhouse, bunkhouse, fire observation tower

**Visitation (2010):** 1000 per year

**On-site Staff (2009):** 1 Protected Areas Manager, 1 Head Ranger, 9 Rangers

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**A new Species for Belize – the Coffeus Rain Frog**

The Critically Endangered Coffeus Rain Frog (*Craugastor coffeus*), previously known only from small populations in northwest Honduras, has recently been discovered in southern Belize - making it Belize's second critically endangered terrestrial vertebrate, along with the Morelet's treefrog. Globally, the most threatened taxon, amphibians are experiencing precipitous declines and extinctions in the region, though populations in Belize appear to remain relatively healthy - despite the presence of the chytrid fungus that is associated with most global declines.
Established in 1990 for wildlife conservation, education and to contribute towards biological connectivity within central Belize, Monkey Bay Wildlife Sanctuary was amongst the first of the private protected areas to be established in Belize. Readily accessible on the Western Highway, Monkey Bay is a popular destination for US study groups and backpackers alike.

**Physical Features**

Annual rainfall ranges from 60-80", with the Reserve lying within the Sibun River Watershed of the coastal plain. The land slopes gently from approx 40m elevation at the north, to less than 10m at the southern end where it abuts the Sibun River and the Monkey Bay National Park.

The northern and southern portions of the Reserve lie on Recent Pleistocene limestone, with a wide band of Paleocene-Eocene limestone running east-west through the middle of the property.

**Biodiversity**

The Reserve provides direct connectivity between short-grass savanna habitat with shrubs on the poor sandy soils in the northern portion, with broad-leaved lowland shrubland and seasonal broad-leaved lowland forest in the central area. This gives way to deciduous lowland riparian shrubland along the Sibun River. Abundant figs and bri-bri along the river bank provide habitat for numerous riparian species including the endangered Baird’s tapir, and common iguanas. The critically endangered Central American river turtle is still present in the Sibun, and the endangered Yucatan black howler monkey has been successfully re-introduced immediately south in the National Park.

A bird inventory has been developed for the Reserve, listing over 220 species.

**Landscape Context**

Monkey Bay Wildlife Sanctuary provides biological connectivity across the Sibun River from the Monkey Bay National Park, and the Manatee Forest Reserve to the south. It had been planned that this northwards connectivity would form a central link in the planned Central Belize Biological Corridor, but with the development of the Mahogany Heights community immediately north of the Reserve, on the northern side of the Western Highway, biological connectivity has now been largely severed. The proposed route for the Biological Corridor has now therefore shifted eastwards to the Runaway Creek Nature Preserve another private protected area, which along with the Peccary Hills Reserve provide stepping stones in the only...
remaining corridor route that is still forested. Monkey Bay is becoming increasingly bounded by mechanized agriculture to the west, north, and even east.

Stakeholder communities include La Democracia (pop. 400), St. Matthew’s Village (600) and Mahogany Heights (550). The development of the Mahogany Heights community has brought with it increased incursions into both the Monkey Bay Wildlife Reserve and the adjoining National Park.

**History of Establishment**

Purchased by the current owner in 1975, the Reserve was established in 1990 for wildlife conservation and environmental education, with a focus on hosting largely US-based educational visits.

**Management Regime**

Owned by Monkey Bay Wildlife Sanctuary, a non-profit company, the private protected area is managed as a non-extractive reserve for wildlife conservation and environmental conservation. Management costs are supported through the provision of field educational trips for international student groups.

### KEY CONSERVATION THREATS

- Illegal pet trade – parrot poaching
- Illegal logging
- Illegal hunting
- Fire
- Gravel extraction

### SITE INFORMATION

**Size:** 1,150 acres (465ha)  
**Date of Establishment:** 1990  
**IUCN Category:** IV  
**Management Authority:** Private  
**Management Body:** Monkey Bay Wildlife Sanctuary (non-profit company).  
**Contact E-mail:** mbay@btl.net  
**Web site:** www.monkeybaybelize.org  
**Location:** Monkey Bay Wildlife Sanctuary is located on the coastal plain, between the Western Highway to the Sibun River.  
**Uses:** Non-extractive - tourism, education and research  
**Management Plan:** Plan includes zoning and regulations, but needs updating.  
**Biodiversity Information:** Available data limited.  
**Bird inventory 2007**  
**Facilities (2010):** Field stations, office and accommodation  
**Visitation (2008):** 600  
**On-site Staff (2009):** 2 Directors, 1 Site Managers, 1 Education Officer, 1 Head Ranger, 6 Operation Staff
As the largest private protected area in Belize, the Rio Bravo Conservation and Management Area (RBCMA) is held in trust by Programme for Belize (PfB) through a unique agreement with the Government of Belize. Recognized as playing a critical role in Belize’s protected areas system, RBCMA also provides essential connectivity as part of the La Selva Maya forest node, connecting it with the other protected areas of Belize.

Established as a model for private conservation initiatives, RBCMA has attracted several significant investments towards the development of financial sustainability, and today generates a significant portion of its management costs through a certified sustainable timber harvesting operation within a portion of the Reserve. PfB has two field stations, one in the northwest at La Milpa, and the other, Hill Bank on the bank of New River Lagoon.

**Physical Features**

Stretching from the Labouring Creek Tributary of the Belize River to the south, New River Lagoon to the east, and the Guatemalan Border to the west, the RBCMA includes Cretaceous limestone of the Yucatan Platform to Paleocene-Eocene limestone on the Rio Bravo Hills to the northwest. Elevation ranges from 3m to 220m at the highest point, with the majority of the property (>80%) lying on the flat Northern Coastal Plain below 100m elevation. The escarpment of the Rio Bravo Hills rises up in the northwest of the Reserve, with a few hilltops standing above the 200m contour. The eastern areas of the Reserve are relatively poorly drained, and encompass extensive wetlands.

Annual rainfall ranges from 40-80”, with the Reserve straddling portions of three watersheds: Rio Hondo, New River and the Belize River.

**Biodiversity**

As the second largest protected area in Belize, the RBCMA encompasses 18 natural ecosystems – the most extensive being *Tropical evergreen broad-leaved lowland forest on calcareous soils*, *Tehuantepec-Petén variant*, and *Deciduous broad-leaved lowland riparian shrubland of the plains*. Ecosystems range from freshwater lagoons and wetlands, to pine savanna habitats in the southeast to tall forests in the northwest. Traditionally well protected as part of the Belize Estates property, and subsequently under Gallon Jug Industries, then under the management of Programme for Belize, the RBCMA forests harbour some of the best remaining timber resources in Belize (including the vulnerable mahogany and Spanish cedar) – indicative of better forest management and protection practices over the last century or more.

<table>
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<tr>
<th>SPECIES OF INTERNATIONAL CONCERN</th>
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<tbody>
<tr>
<td><strong>Critically Endangered:</strong></td>
</tr>
<tr>
<td>Central American River Turtle</td>
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<tr>
<td>Dermatemys mawii</td>
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<tr>
<td><strong>Endangered:</strong></td>
</tr>
<tr>
<td>Yucatan Black Howler Monkey</td>
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<tr>
<td>Alouatta pigra</td>
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<tr>
<td>Geoffroy’s Spider Monkey</td>
</tr>
<tr>
<td>Ateles geoffroyi</td>
</tr>
<tr>
<td>Sabrinus Rain Frog</td>
</tr>
<tr>
<td>Craugastor sabrinus</td>
</tr>
<tr>
<td>Baird’s Tapir</td>
</tr>
<tr>
<td>Tapirus bairdii</td>
</tr>
<tr>
<td>Yaxnik</td>
</tr>
<tr>
<td>Vitex gaumeri</td>
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<tr>
<td><strong>Vulnerable</strong></td>
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<tr>
<td>Spanish Cedar</td>
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<tr>
<td>Cedrela odorata</td>
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<tr>
<td>Great Curassow</td>
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<tr>
<td>Crax rubra</td>
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<tr>
<td>Mahogany</td>
</tr>
<tr>
<td>Swietenia macrophylla</td>
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<tr>
<td><strong>IUCN, 2010</strong></td>
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</tbody>
</table>

Elevation: 3m - 220m above sea level  
Geology: Undifferentiated Cretaceous limestone  
Recent Pleistocene  
Miocene-Pleistocene limestone  
Paleocene-Eocene limestone  
Annual Rainfall Regime: 40 - 80” (1016 – 2032mm)
The biodiversity of the RBCMA has been more extensively studied than that of most other protected areas of Belize, and the area is known to include over 240 species of trees, 400 species of birds and 70 species of mammal. The critically endangered Central American River turtle occurs within the Reserve, though recent surveys of New River and New River Lagoon failed to locate any specimens (Rainwater, pers. com.) – probably reflecting the precipitous collapse of ‘hicatee’ populations throughout the Country as a result of unsustainable harvesting occurring into this area too. The endangered yellow-headed parrot still breeds on the pine savannas within the Reserve, aided by the implementation of a species recovery plan. The endangered Yucatan howler monkey, Geoffroy’s spider monkey, Baird’s tapir and the Sabrinus rain frog occur within the Management Area – the latter being the most northerly known population of this species, and beyond its published range limit in the northern Maya Mountains Massif.

The globally and nationally vulnerable great curassow is present in the private protected area, as are the ocellated turkey and crested guan – both of which are considered nationally vulnerable.

**Landscape Context**

As part of the Selva Maya, Rio Bravo has biological connectivity with the Maya Biosphere Reserve of Guatemala and the Calakmul Biosphere Reserve of southern Mexico. The Selva Maya represents one of the largest remaining tracts of forest in Mesoamerica, with Rio Bravo forests being amongst the least impacted. In Belize, these forests are contiguous with those of the Gallon Jug Estate (a non-formalized, but registered private protected area), and with those of the Yalbac Hills – also currently being considered for protection. Together, these forests represent a huge area with very limited public access (and therefore very limited encroachment), and harbour the most viable remaining populations of game species such as the white-lipped peccary, crested guan, great curassow, white-tailed deer and ocellated turkey - species that have suffered sharp declines throughout much of the rest of their ranges in Belize in recent years.

In Guatemala, biological connectivity between La Selva Maya and the Chiquibul Montañas Mayas Biosphere Reserve has largely been lost through extensive encroachment, development, and the establishment of numerous communities in and between the protected areas. Regionally, biological corridor functionality through the region can only be maintained in Belize, with Rio Bravo forming a critical role – linking the Guatemalan and Mexican protected areas southwards to the Spanish Creek National Park and the newly created Jaguar Corridor, from where biological connectivity still largely remains to the Maya Mountains Massif. This retained connectivity is no accident - Programme for Belize has acquired additional lands since the initial purchase and donations, specifically to maintain biological connectivity with other protected areas in Belize.

The RBCMA represents the largest significant forest in northwest Belize, largely bounded to the north by extensive Mennonite agricultural lands, with agriculture reaching close to the boundary of the Reserve as far east as the New River Lagoon shoreline.

**KEY CONSERVATION THREATS**

- Uncontrolled burning of savannah
- Illegal cultivation (Marijuana) in the broadleaf forest area.
- Illegal pet trade – parrot poaching
- Illegal logging
Established in 1988 by Programme for Belize, the Rio Bravo Conservation and Management Area (RBCMA) has grown to its current 259,207 acres through a number of extensions since the initial purchase of approx 110,000 acres from the Gallon Jug Industries. Close to 95,000 acres of this extension came through the donation of contiguous lands by Coca Cola Foods Inc., and additional tracts were subsequently purchased to provide biological connectivity as part of the Central Belize Biological Corridor.

Purchased as private properties to “To conserve the biodiversity of Belize and to promote sustainable use of forest resources... and... to demonstrate that conservation and development can be compatible”, the RBCMA is managed by Programme for Belize (PfB) a Belize NGP. PfB entered into a Memorandum of Agreement with the Government of Belize holding and managing the land in trust for the people of Belize. The MoA commits the land to conservation management, irrespective of ownership. Management of these systems in addition to the actual protection program makes the core of the Rio Bravo management plan. The sustainable timber harvesting and the ecotourism adds as a management tool and serves as the major revenue generating arm which complements projects and grants.

**SITE INFORMATION**

- **Size:** 259,206 acres (104,897ha)
- **Date of Establishment:** 1988
- **IUCN Category:** IV
- **Management Authority:** Private
- **Management Body:** Programme for Belize
- **Contact E-mail:** pfbel@btl.net
- **Web site:** www.pfbelize.org

**Location:** The RBMCA is situated in the west of Belize, on the northern coastal plain.

**Uses:** Non-extractive - tourism, education and research; Extractive - Sustainable timber production

**Management Plan:** 2006 – 2010 (5th management plan)

**Biodiversity Information:**

- **Facilities (2010):** 2 Field stations, central office in Belize City
- **Visitation (2010):** 1000 per year
- **On-site Staff (2009):** 2 Site Managers, 9 Rangers, 1 Biologist, 1 Forester, 1 Assistant Forester, 4 Forestry Field Staff, supported by an extensive administration and tourism network
Runaway Creek Nature Preserve was established as a bird-banding site under the Birds Without Borders avian research programme, and purchased and established as a private protected area in 1998 by the Milwaukee Zoological Society. It is an accessible reserve, and has focused largely on training in avian research. Ownership is now in the process of transfer to the Foundation for Wildlife Conservation – established by the Reserve’s founder.

**Physical Features**

The topography is dramatic, with savannas occurring on the flat coastal plain in the southwest of the reserve, and broad-leaved forest cloaked limestone hills rising abruptly to 120m. The flatlands occur on Recent Pleistocene, and the hills are comprised of Paleocene-Eocene rock.

The northern portion of the Reserve lies within the Sibun River watershed, and the southern portion is within that of the Manatee River.

**Biodiversity**

Five ecosystems occur within the Reserve, grading from short-grass savanna, through broad-leaved lowland forest on poor or sandy soils, to lowland broad-leaved hill forest on steep karstic hills. Riparian forest on alluvial soils, and riparian shrubland also occur on the property. Mechanized agriculture (citrus) existed in the northwest of the Reserve.

Species of global conservation concern include the critically endangered Central American river turtle, the endangered Baird’s tapir, Yucatan black howler monkey, spider monkey, and fiddlewood, and the vulnerable great curassow mahogany and Spanish cedar.
Extensive bird-banding research, focusing on migratory birds, has been undertaken within the Reserve. A total of 315 species of birds have been recorded in the reserve.

**Landscape Context**

Runaway Creek, and the adjacent Peccary Hills Reserve, play a critical role both nationally and regionally in connectivity: primarily in the maintenance of connectivity between the Maya Mountains Massif and La Selva Maya. Direct connectivity with the Manatee Forest Reserve, to the south, has been lost through boundary realignments of the latter – though functional connectivity remains through the contiguous habitats. The Peccary Hills Reserve abuts Runaway Creek on the eastern boundary, and in turn abuts the Peccary Hills National Park to the east.

Stakeholder communities include La Democracia, Mahogany Heights and Freetown Sibun. Runaway Creek is bounded to the west by extensive agricultural development, primarily citrus.

**History of Establishment**

Originally purchased and established as a reserve in 1998 by the Milwaukee Zoological Society, the Reserve’s founder Gil Boese established the non-profit Foundation for Wildlife Conservation – which aims to purchase the lands for continued conservation management.

**Management Regime**

Now managed by the non-profit Foundation for Wildlife Conservation, Runaway Creek is managed as a conservation area and used for research and education. It is perhaps best known as for the avian research conducted by Birds Without Borders.
Shipstern Nature Reserve

Shipstern Nature Reserve, one of the first nationally recognized private protected areas, lies on the northern, flat limestone of the Yucatan platform. Including land both north-west and south-east of Shipstern Lagoon, the largest lagoon system in the country, it provides protection for Yucatan dry forest, saline lagoons, mangroves, wetlands and Yucatan endemic species.

Physical Features

The flat, north east of Belize is considered a continuum of the Yucatan peninsula, a marine platform that was uplifted to form a low lying limestone plain. There is little topographical relief apart from gentle undulations which are directly related to the topography of the upper bedrock. Typical limestone characteristics such as sinkholes, caves and natural wells are found throughout the Shipstern area. The soil cover varies from 0 - 60cm, and the top of the limestone bedrock is frequently exposed at the surface.

The reserve lies within the Shipstern watershed, and includes land on both sides of Shipstern Lagoon, a major focal point of the area, which stretches for approximately 20km from the north eastern point of Belize to the south west. This shallow lagoon system is a matrix of open expanses of water linked by small channels lined with mangrove and savanna. Water depth varies with changing seasons and weather conditions, but is consistently shallow. In some channels the water reaches depths of over 2 metres, but in the open areas, normal depths range from 60 – 80 centimetres to as shallow as only a few centimetres barely covering thick deposits of fine silt.

Biodiversity

Encompassing a wide range of ecosystems, from saline mudflats and mangrove savanna to seasonal and dry forests, Shipstern Nature Reserve is recognized as a critical component of the Protected Areas System and Mesoamerican Biological Corridor, filling a number of highlighted critical gaps in ecosystem coverage for Belize. Shipstern Nature Reserve is identified in the national gap assessment as the only protected area in the country supporting seasonal and dry forests typical for the Yucatan Peninsula - the Tropical evergreen seasonal lowland forest on calcareous soils, Yucatan variant (Meerman, 2005). This is characterized by the presence of Yucatan endemics such as the Kuka palm (Pseudophoenix sargentii) and Yucatan Jay (Cyanocorax yucatanicus). The kuka palm, occurs only in the Shipstern area in mainland Belize, and in Bacalar Chico on Ambergris Caye, and is threatened in its limited Mexican range by rapid tourism development.

The protected area lies in one of Belize’s Important Bird Areas lagoon system supports nesting cayes for reddish egrets, white ibis, roseate spoonbills and boat billed herons, and two nationally important colonies of wood storks, whilst the forested areas provide habitat for forest all five of Belize’s cats, as well as, over 290 species of birds, including keel-billed toucans and the vulnerable great curassow. The swamp pools provide habitat for Morelet’s crocodiles and a variety of freshwater turtles.

SPECIES OF INTERNATIONAL CONCERN

| Endangered: | Vitex gaumeri |
| Tapirus bairdii |

| Vulnerable: |
| Crax rubra |
| Cedrela odorata |
| Pouteria belizensis |

| Species of International Concern |

| Endangered: |
| Tapirus bairdii |

| Vulnerable: |
| Crax rubra |
| Cedrela odorata |
| Pouteria belizensis |

IUCN, 2010
Landscape Context

Shipstern Nature Reserve is part of a network of protected areas – both national and private protected areas, with Corozal Bay Wildlife Sanctuary to the east, and beyond that, Bacalar Chico Marine Reserve and National Park, and Fireburn Reserve (private) to the south. It is considered a core area of the north east biological corridor, though increasing agricultural expansion, particularly by the Mennonite farming community of Little Belize, threatens the integrity of the corridor link to Fresh Water Creek Forest Reserve and Honey Camp National Park. The increasing agricultural footprint of Little Belize is also cause for concern as it extends into the wetlands draining into the southern end of Shipstern Lagoon, with the potential for impacts from agricultural runoff.

Both Chunox and Sarteneja, two of the primary stakeholder communities, have expanding agricultural areas that are gradually extending into the buffering forest adjacent to the Nature Reserve.

History of Establishment

Situated in the north east of Belize, Shipstern was established as the first nationally recognized private protected area (as Shipstern Wildlife Reserve) in 1987. The name was amended to Shipstern Nature Reserve following transfer of ownership in 1989, with management falling under the Shipstern Nature Reserve (Belize) Ltd, later registered as a non-profit organization, in 2006. The area consists of four separate parcels: the majority of the original Shipstern Reserve (19,286 acres), along with more recent extensions - the Xopol area (1531 acres), Mahogany Park (37 acres) and the Northern Biological Corridor extension (approx 4,000 acres) to the south east).

Management Regime

Shipstern Nature Reserve (Belize) Ltd was registered as an NGO in 2006, and has a Board of Directors of three that supervises operations, while site-level management is carried out by the Executive Committee consisting of the Manager, the Administrator and the ITCF Coordinator. At the site level, the Reserve is managed by a staff of nine. As a private reserve, the management regime of Shipstern is defined by the management organization with a management regime similar to that of a National Park.
References


Ervin, J. (2003) WWF: Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) Methodology WWF Gland, Switzerland


Heyman W. and N. Renquena, (2003). Fish Spawning Aggregation Sites in the MBRS Region: Recommendations for Monitoring and Management, MBRS


IUCN Red List (Downloaded 2009)


McField et. al. (2007) . Healthy Reefs for Healthy People


Ministry of Natural Resources (2002). Belize National Report to the World Summit on Sustainable Development


Mumby P. (2009). Fishing Down the Food web (Open letter to Belize Fisheries Department)


TEEB (2009). The Economics of Ecosystems and Biodiversity for National and International Policy Makers – Summary: Responding to the Value of Nature


World Resources Institute (2005). Belize Coastal Threat Atlas (Draft)


World Resources Institute (2005). Belize Coastal Threat Atlas (Draft)

Annexes
## Summary of Protected Area Designation, Goals and Scores

<table>
<thead>
<tr>
<th>Protected Area</th>
<th>Legislated Goals</th>
<th>IUCN category</th>
<th>Primary Protected Area Vision / Goal</th>
<th>Bio Score</th>
<th>NI Score</th>
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<tbody>
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<td><strong>National Parks</strong></td>
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</tr>
<tr>
<td>Aguas Turbias</td>
<td>For the protection and preservation of natural and scenic values of national significance for the benefit and enjoyment of the general public</td>
<td>II: Natural areas of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation detrimental to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.</td>
<td>To maintain trans-boundary connectivity within the Maya Forest of Calakmul-Rio Bravo.</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Bacalar Chico</td>
<td>V: An area of land with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.</td>
<td>To provide protection for the physical and biological resources of north Ambergris Caye, which includes a wide range of interdependent habitats in a region targeted for extensive further development.</td>
<td>2.00</td>
<td>1.61</td>
<td></td>
</tr>
<tr>
<td>Billy Barquedier</td>
<td>II: Natural areas of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation detrimental to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities</td>
<td>To protect watersheds, biodiversity, And for the potential for generating tourism revenue for the local economy.</td>
<td>2.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chiquibul</td>
<td></td>
<td></td>
<td>A core area of protection of biological diversity within the Chiquibul Forest and is recognized.</td>
<td>2.25</td>
<td>2.87</td>
</tr>
</tbody>
</table>
opportunities, all of which must be environmentally and culturally compatible.

<table>
<thead>
<tr>
<th>Protected Area</th>
<th>Within the Greater Chiquibul/Maya Mountains Region for its intrinsic natural and cultural values, whilst contributing to national development, regional security and cooperation, and enhancing and maintaining its ecological integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five Blues Lake</td>
<td>To protect the natural resources and biodiversity for future generations, and provide socio-economic benefits for St. Margaret’s village</td>
</tr>
<tr>
<td>Gra Gra Lagoon</td>
<td>To maintain its value in terms of conserving biodiversity, providing critical ecological services, and contributing to the local economy and social well-being through recreational use</td>
</tr>
<tr>
<td>Guanacaste</td>
<td>To promote understanding of nature and the environment, in order to provide recreation opportunities and foster respect for the park and its personnel, whilst maintaining the biological integrity of the area</td>
</tr>
<tr>
<td>Honey Camp</td>
<td>To prevent further land allocations and de-reservation, and to attempt restoration of the reportedly severely impacted biodiversity of the lagoons.</td>
</tr>
<tr>
<td>Laughing Bird Caye</td>
<td>To protect the unique biodiversity associated with the Laughing Bird Caye faro, and to manage, protect and promote the sustainable use of Laughing Bird Caye National Park for the benefit of present and</td>
</tr>
</tbody>
</table>
Mayflower Bocawina | To protect the natural habitat of the area and the archaeological site located within it, as well as providing opportunities for tourism and recreation-related activities. | 1.76
---|---|---
Monkey Bay | To compliment the Monkey Bay Wildlife Sanctuary in creating a wildland corridor across the Sibun Watershed | 2.56 1.24
Noj Kaax H’Men Elijio Panti | For the Preservation and Conservation of the Natural Resources, Cultural patrimony and community Development | 2.20 2.66
Payne’s Creek | The maintenance of biodiversity within the Payne’s Creek National Park. | 3.09
Peccary Hills | | 2.61
Rio Blanco | Was requested by Santa Elena and Santa Cruz to protect a unique waterfall and popular swimming spot | 2.16
Sarstooven-Temash | To safeguard the ecological integrity of the Sarstooven-Temash region and employ its resources in an environmentally sound manner for economic, social and spiritual well being of its indigenous people | 3.22 3.48
St. Herman’s Blue Hole | To conserve natural and cultural resources for ecosystem values, education, and recreation through collaboration with relevant stakeholders. | 2.75
### Natural Monuments

<table>
<thead>
<tr>
<th>Name</th>
<th>Purpose</th>
<th>Management and Purpose</th>
<th>Area</th>
<th>Visitor Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actun Tunichil Muknal</td>
<td>For the protection and preservation of national features of national significance</td>
<td>Ia: Protected area managed mainly for science To protect and preserve a natural geological feature and allow for visitation</td>
<td>2.48</td>
<td></td>
</tr>
<tr>
<td>Blue Hole</td>
<td></td>
<td>III: Protected area managed mainly for conservation of specific natural features To protect and preserve natural resources and nationally significant natural features of special interest or unique characteristics to provide opportunities for interpretation, education, research and public appreciation for the benefit of current and future generations, within a functional conservation area.</td>
<td>1.14</td>
<td>3.34</td>
</tr>
<tr>
<td>Half Moon Caye</td>
<td></td>
<td>II: Protected area managed mainly for ecosystem protection and recreation. To protect and preserve the aesthetic values</td>
<td>1.54</td>
<td>3.35</td>
</tr>
<tr>
<td>Thousand Foot Falls</td>
<td></td>
<td>III: Protected area managed mainly for conservation of specific natural features To protect the aesthetic values</td>
<td>2.82</td>
<td></td>
</tr>
<tr>
<td>Victoria Peak</td>
<td></td>
<td>To maintain biodiversity, cultural resources and watershed areas within a functional conservation area, as an integral part of the National Protected Areas System</td>
<td>3.13</td>
<td></td>
</tr>
</tbody>
</table>

### Nature Reserve

<table>
<thead>
<tr>
<th>Name</th>
<th>Purpose</th>
<th>Management and Purpose</th>
<th>Area</th>
<th>Visitor Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladen</td>
<td>For the protection of biological communities or species, and the maintenance of natural processes in an undisturbed state</td>
<td>Ia: Protected area managed mainly for science For the protection of nature be it biological communities or species and to maintain natural processes in an undisturbed state in order to have an ecologically representative example of the natural environment available for scientific study, monitoring, education and the maintenance of genetic resources</td>
<td>2.64</td>
<td>2.92</td>
</tr>
<tr>
<td>Burdon Canal</td>
<td></td>
<td>Ia: Protected area managed mainly for science</td>
<td></td>
<td>1.32</td>
</tr>
<tr>
<td>Tapir Mountain</td>
<td></td>
<td>II: Protected area managed mainly for ecosystem To retain in perpetuity a portion of the northern Maya Mountain foot-</td>
<td>2.34</td>
<td></td>
</tr>
</tbody>
</table>
### Wildlife Sanctuaries

<table>
<thead>
<tr>
<th>Name</th>
<th>Protection and Recreation</th>
<th>Protection Area Management</th>
<th>Area and Type</th>
<th>Area and Management</th>
<th>Threats to Manatees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aguacaliente</td>
<td>For the protection of nationally significant species, biotic communities or physical features</td>
<td>IV: Protected area managed mainly for conservation through management intervention</td>
<td>To safeguard the future of manatees by reducing threats to their health and their habitat.</td>
<td>1.60</td>
<td>2.26</td>
</tr>
<tr>
<td>Cockscomb Basin</td>
<td></td>
<td></td>
<td>To maintain biodiversity, cultural resources and watershed areas within a functional conservation area, as an integral part of the National Protected Areas System</td>
<td>3.13</td>
<td></td>
</tr>
<tr>
<td>Corozal Bay</td>
<td></td>
<td></td>
<td>To protect the significantly important population of West Indian manatee, as part of a bi-national initiative</td>
<td>1.54</td>
<td>2.24</td>
</tr>
<tr>
<td>Crooked Tree</td>
<td></td>
<td></td>
<td>To maintain biological integrity and traditional cultural resources within a functional conservation area, as an as effective RAMSAR site, and as an integral part of the National Protected Areas System</td>
<td>2.25</td>
<td>2.88</td>
</tr>
<tr>
<td>Gales Point</td>
<td></td>
<td></td>
<td>To protect and maintain the natural resources of the Gales Point Wildlife Sanctuary as an integral part of the National Protected Areas System</td>
<td>2.90</td>
<td>1.91</td>
</tr>
<tr>
<td>Spanish Creek</td>
<td></td>
<td></td>
<td>To protect biodiversity and abundant flora and fauna in and around the protected area, and to generate income within the community</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swallow Caye</td>
<td></td>
<td></td>
<td>To safeguard the future of manatees by reducing threats to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine Reserve</td>
<td>Their health and their habitat.</td>
<td>Type of Protected Area Management</td>
<td>Area of Focus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacalar Chico</td>
<td><em>For the special protection of the aquatic fauna and flora of such areas and to protect and preserve the natural breeding grounds and habitats of aquatic life, and to allow for the natural regeneration of aquatic life in areas where such life has been depleted.</em></td>
<td>IV: Protected area managed mainly for conservation through management intervention</td>
<td>To provide protection to the physical and biological resources of north Ambergris Caye, which includes a wide range of interdependent habitats, in a region targeted for extensive further development. 2.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caye Caulker</td>
<td></td>
<td>VI: Protected area managed mainly for the sustainable use of natural ecosystems</td>
<td>To protect marine and island wildlife and habitats at risk at Caye Caulker 2.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gladden Spit and Silk Cayes</td>
<td></td>
<td>IV: Protected area managed mainly for conservation through management intervention</td>
<td>To protect the spawning aggregation and whale sharks of Gladden Spit, the idyllic Silk Cayes and key reef ecosystems within the multi-zoned marine reserve 3.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glover’s Reef</td>
<td></td>
<td></td>
<td>To provide protection for the physical and biological resources of Glover’s Reef, in order to maintain and sustain these resources for the benefit of current and future generations. 2.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hol Chan</td>
<td></td>
<td>II: Protected area managed mainly for ecosystem protection and recreation.</td>
<td>Protection of recreational (especially Hol Chan Channel and Shark Ray Alley) and fishing resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port Honduras</td>
<td></td>
<td>IV: Protected area managed mainly for conservation through management intervention</td>
<td>To protect the physical and biological resources of the reserve 2.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapodilla Caye</td>
<td></td>
<td></td>
<td>To protect the southern terminus of the Belize Barrier Reef, as part of the World Heritage Site designation 2.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Water Caye</td>
<td></td>
<td></td>
<td>To protect the exceptional integrity of the marine ecosystems, and provide for the wise use,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Protected Areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>----------------------------------------</td>
<td>-----------------------------------------------------------------</td>
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<td>-----------------------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Community Baboon Sanctuary</td>
<td>To protect habitats for the black howler monkeys</td>
<td>2.40</td>
<td>2.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golden Stream Corridor Preserve</td>
<td>To protect Belize’s Southern Biological Corridor and the Golden Stream Watershed from alternative large-scale agriculture/aquaculture.</td>
<td>1.58</td>
<td>3.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monkey Bay Wildlife Sanctuary</td>
<td>To serve as a model of private land stewardship while conserving and protecting land and biodiversity in ways that accrue benefits to land owners and local communities</td>
<td>1.90</td>
<td>2.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rio Bravo Conservation and Management Area</td>
<td>To conserve the biodiversity of Belize and promote the sustainable use of Forest reserves, and to demonstrate that conservation and development can be compatible</td>
<td>3.56</td>
<td>3.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runaway Creek Nature Preserve</td>
<td>To protect the flora and fauna of Central Belize and form part of the biological corridor between the Selva Maya and Maya Mountains Massif</td>
<td>2.73</td>
<td>1.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shipstern Nature Reserve</td>
<td>For the protection and conservation of the Yucatan dry forest ecosystem, saline lagoons, mangroves, wetlands and Yucatan endemic species</td>
<td>2.33</td>
<td>2.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIDE Private Protected Lands</td>
<td>Conservation of biodiversity and sustainable use of natural resources in Southern Belize</td>
<td>2.67</td>
<td>2.35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bird Sanctuaries
### 2011 - Directory of Protected Areas in Belize

<table>
<thead>
<tr>
<th>Area</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monkey Caye</td>
<td>For the protection of nationally important bird nesting colonies</td>
</tr>
<tr>
<td>Little Guana Caye</td>
<td></td>
</tr>
<tr>
<td>Los Salones</td>
<td></td>
</tr>
<tr>
<td>Bird Caye</td>
<td></td>
</tr>
<tr>
<td>Un-Named</td>
<td></td>
</tr>
<tr>
<td>Man of War</td>
<td></td>
</tr>
<tr>
<td>Dubloon Bank</td>
<td></td>
</tr>
</tbody>
</table>