

The Status of Protected Areas

in Belize

2009

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Acronyms and Abbreviations

BAS	Belize Audubon Society
BFD	Belize Fisheries Department
CBD	Convention on Biological Diversity
СВО	Community-based Organization
CCAD	Central American Commission on the Environment and Development
FAMRACC	Forest and Marine Reserve Association of Caye Caulker
FCD	Friends for Conservation and Development
FD	Forest Department
IUCN	International Union for the Conservation of Nature
LAMP	Long-term Atoll Monitoring Project
MBRS	Mesoamerican Barrier Reef System
MPA	Marine Protected Area
MR	Marine Reserve
NGO	Non-Governmental Organization
NPAPSP	National Protected Areas Policy and System Plan
PfB	Programme for Belize
PROARCA	Central American Environmental Program
SACD	Sarteneja Alliance for Conservation and Development
SATIIM	Sarstoon Temash Institute for Indigenous Management
SEA	Southern Environmental Association
TIDE	Toledo Institute for Environment and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
WWF	World Wildlife Fund

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 workshops and assessments. Thanks also go to Yvette Alonzo and the Board members of the Association of Protected Area Management Organizations, as well as Julie Stockbridge and Natalie Rosado of the Belize TNC office, for all their input and assistance, and to Eden Garcia for his input into the development of the marine indicators.

We would also like to thank Adam Lloyd (GIS Officer, Wildtracks), Katie Dyke, Adi Barash and Carol Chang (Wildtracks) for their assistance in the preparation of the assessment reports:

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EXECUTIVE SUMMARY

Belize has long been considered a leader in conservation within the Mesoamerican region, with the designation of 36% of its terrestrial area for conservation (including sustainable resource use) and 13 marine protected areas. Belize has at its heart the Maya Mountains Massif – one of the few remaining large, intact blocks of forest in Central America. The Belize Barrier Reef runs parallel to the shore, a valuable resource for traditional fishing communities and Belize's marine-based tourism industry, and encompassing some of the richest marine resources of the Mesoamerican Barrier Reef System. This global importance has been recognized through the declaration of seven of these marine sites as components of a serial World Heritage Site, in 1996.

With a wide range of increasing pressures and threats that include climate change, unsustainable extraction practices, increasing development impacts, and impacts from tourism, effective management of these protected areas is becoming more and more urgent if Belize is to continue to maintain its natural resources for critical environmental services, sustainable use, economic contribution to the Nation, and to meet its international commitments.

Management effectiveness has been recognized as a critical tool in the conservation of Belize's natural resources, and development of a national evaluation framework was included as one of the goals of the National Protected Areas Policy and System Plan initiative of 2004 (NPAPSP, 2005), in the form of a specific national monitoring tool (Young et. al., 2005).

Chapter One introduces the National Protected Areas System and the site-level and system level management units. This assessment looks at the management effectiveness of Belize's National Protected Areas System, represented by sixty-eight national protected areas and eight private protected areas, including the eight Marine Reserves¹ and eleven spawning aggregation sites, managed under the Fisheries Department of the Ministry of Agriculture and Fisheries. It also covers the forty-nine protected areas administered under the Forest Department of the Ministry of Natural Resources, as well as the seven Crown Land Bird Sanctuaries, identifying strengths and weaknesses of the system as a whole.

Chapter Two introduces the concepts of assessing management effectiveness, and past outputs from the first national assessment in 2006. It also presents the framework and methodology used. The assessment was conducted through a series of workshops and meetings, held between May and August, 2009, with representatives from the two management authorities

¹The management zones within any specific Marine Reserve are counted as a single protected area, not divided into several management units as is the case within the NPAPSP reports

and all co-management agencies. Site-level self-assessments were completed by protected area representatives for each of the terrestrial and marine protected area, to enable evaluation of the status of biodiversity within individual protected areas and across the protected area system. Information was also collated from protected area reports and management plans, and through meetings with specific protected area managers, staff and stakeholders, to address identified information gaps.

The data has been used to provide an overview of the state of protected areas in Belize today, with recommendations for improving future management effectiveness across the system. A series of individual protected area reports has also been produced, providing the assessment results per protected area, with site-level recommendations for use by protected area managers to assist in adaptive management.

Chapter Three presents the results from the biophysical indicators for both terrestrial and marine protected areas, highlighting those indicators of particular concern, and impacts (pressures and threats) across the national protected areas system. The terrestrial biodiversity indicators demonstrate that whilst the National Protected Areas System is considered to be generally fulfilling its role of maintaining representative ecosystems, watershed functionality and other environmental services, it is significantly challenged in the role of biodiversity protection for those species targeted for extraction (particularly commercial fish species, hicatee, game species, xaté, and those species with limited ranges or ecosystem niches, such as yellow headed parrots, scarlet macaws). National indicators suggest that the increasing human footprint within Belize, and the spread of unsustainable agriculture is starting to place external pressures on the terrestrial protected areas, exacerbated by the limited understanding in stakeholder communities of the important role these areas play in providing environmental services such as future water security.

In the marine sector, the indicators show that surveillance and enforcement units of the marine protected areas, in partnership with the Belize coastguard, are stretched in their role of ensuring sustainable use of Belize's marine resources, with fishermen not yet fully engaged in the management of the marine fisheries sector. Belize has seen the rapid decline of its fisheries stocks over the last seven years (Mumby, 2009), and coastal fishing communities are having to face the reality that the marine resources will not be able to support them in the future (SACD, 2009).

The political and logistical challenges of protecting Belize's resources from transboundary incursions, both in the terrestrial and marine environment, have also resulted in significant biodiversity loss over the last five years, with the threat of local extirpations in some cases.

Chapter Four presents the results from the National Management Effectiveness Monitoring Tool (Young et. al., 2005), highlighting the strengths of the System and those areas most in need of strengthening. It also presents the results for each of the seven indicator sections. The outputs

from the indicators of the National Monitoring Tool suggest that the national protected area system in Belize is considered to rate as **MODERATE** in the level of management effectiveness, averaging a score of 2.44 $(61.1\%)^2$ out of a possible 4.00 across the system. During the assessment process, a number of areas have been identified as in need of further strengthening.

Of the seven Indicator Categories, under which the 64 indicators are allocated, all seven rate as **MODERATE**, scoring between >2.00 and \leq 3.00 out of a possible 4.00. The strongest Indicator Category is identified as **Governance**, with a score of 2.76 (69.0%), though it is recognized that the indicators do not reflect the observed significant weaknesses in governance under central Government.

The weakest is identified as **Participation, Education and Socio-Economic Benefit**, with a score of 2.14 (53.6%), ranking at the lower end of MODERATE. Scores for individual indicators range from the highest - **Indicator 2.1: Legal Status** – with a score of 3.80 (95.0%) to the lowest - Indicator **3.12: Sustainable Use for Economic Benefits** – with a score of 1.38 (34.5%).

Belize is committed to the conservation and sustainable use of its natural resources through the effective management of its marine and terrestrial protected areas – the draft National Protected Area Policy seeks to ensure increased social and economic benefit while guaranteeing core protected area objectives (NPAPSP, 2005). However, analysis of the biodiversity and socio-economic outputs demonstrate a limited effectiveness of protected areas in fulfilling their primary mandates: biodiversity conservation and socio-economic benefit.

Strengths of the National Protected Areas System

- 1. Effective conservation of ecosystems, ecosystem functionality, and the provision of environmental services.
- 2. Broad, representative coverage of most ecosystems, on a scale considered sufficient to conserve most species in the long-term.
- 3. Strengthening of the effectiveness of the system through the National Protected Areas Policy and System Plan.
- 4. Strengths through partnerships between the Forest and Fisheries Departments and civil society.
- 5. Significant operational, technical and administrative capacity across the protected areas system.

² Microsoft Access was used for data analysis

Areas of Concern

Six overarching areas of concern related to the National Protected Area System have been identified during the assessment, and associated recommendations have been developed to address these, for strengthening of the System through increased management effectiveness.

- 1. Weak (Central) Governance
- 2. Inadequate Surveillance and Enforcement
- 3. Limited financial sustainability and viability
- 4. Limited formal, structured and legally valid agreements between GOB authorities and civil society conservation partners
- 5. Limited Government Support for progress in system-level planning & management
- 6. Decreasing biological connectivity between protected areas
- 7. Limited preparedness for the predicted impacts from climate change
- 8. No legal recognition / regulation of Private Protected Areas
- 9. Need for strengthening of site-level management

SUMMARY OF RESULTS

Strengths of the National Protected Areas System

- 1. Belize's protected area system is currently considered largely effective in conserving ecosystems, ecosystem functionality, and the provision of environmental services.
- 2. The design, extent and distribution of the protected area system ensures broad, representative coverage of most ecosystems, on a scale considered sufficient to conserve most species in the long-term.
- 3. The development of the National Protected Areas Policy and System Plan, and its subsequent implementation, is strengthening the effectiveness of the system.
- 4. The partnerships between the Forest and Fisheries Departments and civil society, through co-management agreements and other formalized agreements, has increased stakeholder participation and support for the protected areas system, and increased access to international funding sources for the conservation of biodiversity and for associated provision of opportunities for increased socio-economic benefits.
- 5. Significant operational, technical and administrative capacity exists across the overall management of the protected areas system, but is not evenly spread, or broadly prioritized in its application.

Areas of Concern and Recommendations

- 1. Weak (Central) Governance, whilst not assessed directly by the current Management Effectiveness Assessment Tool, currently poses one of the biggest threats to the individual protected areas and to the System as a whole. Significant limitations include:
 - Limited implementation of national legislation and policies, resulting in illegal allocation and subsequent de-reservation of lands within the Pas. This is now starting to affect:
 - critical size, and potentially minimum dynamic size for some systems
 - connectivity between protected areas and protected area blocks
 - environmental services including watershed protection
 - erosion of public understanding of the importance of the National Protected Areas System

- Limited Government commitment to the NPAS the NPAS is not perceived as a NATIONAL commitment by Government for Belize, which is further reflected in lack of adequate enforcement and public awareness, particularly within the terrestrial protected areas
- Short term political use of natural resources for example, in the allocation of short-term logging licenses and other concessions – contrary to the technical guidance of civil servants seeking to put in place long term sustainability mechanisms
- Limited political commitment to protecting Belize's natural resources and national security from trans-boundary incursions.

Recommendations:

- The National Protected Areas Policy and System Plan should be fully adopted by all partners, and the National Protected Areas Commission, with a broad stakeholder composition, fully established as the authority responsible for implementation of the NPAPSP.
- The Forest Department, as the authority for terrestrial protected areas (and some in the marine sector) should be strengthened with significant increases in central budget allocations (and other financing mechanisms) to be better positioned to fulfil its mandate and better oversee the management of Belize's terrestrial protected areas system and natural resources therein, for the benefit of Belize.
- A national public awareness campaign by GOB to re-affirm its commitment to the NPAS, and the national benefits derived from it, as well as clarifying the roles and responsibilities of the co-managers in their support of the protected areas.
- Due process, as prescribed within the NPAPSP, should be fully implemented by central Government in decision-making processes relating to the NPAS and natural resources.
- That any development, concessions, permitting and license allocations follow due process, with increased collaboration, communication and transparency between Government Departments and co-management agencies
- Enforcement of Protected Area legislation and policies should be significantly strengthened as a matter of urgency.

 Surveillance and Enforcement is severely inadequate within the protected areas, and across the protected area system as a whole: illegal hunting, fishing and logging is causing significant declines in many species, with some indicator species having a VERY HIGH Level of Risk.

Recommendations:

- Strengthen enforcement of the Protected Area legislation, policies and implementation, including the establishment of two trained, equipped and armed Rapid Response Teams (one marine-based, one terrestrial) - tasked to support existing surveillance and enforcement personnel and processes.
- Increased fines and facilitated prosecution process for protected area infractions.
- Strengthened human resource management including increased capacitybuilding, equipping, support, and tackling of corruption at all levels
- 3. Limited financial sustainability and viability is a major weakness in the protected area system, particularly for the terrestrial protected areas, and is inadequately reflected with the current indicators of the management effectiveness assessment tool. The financial constraints for protected areas management by the Forest Department do not reflect the scope of its mandate protected area co-managers remain too dependent on grant fund, and grant-funding remains largely un-systematized and inefficient. 'Novel' funding mechanisms such as payment for environmental services (including carbon sequestration) remain largely untapped;

Recommendations:

- Greater investment in the Protected Areas Management Programme of the Forest Department should be prioritized within the budget of the MNREI.
- Protected areas co-managers should strengthen business planning and broaden marketable services available to develop a more diverse income base.
- Where practicable, grant funds (especially PACT) should be systematized to fill site and system-level gaps in management, and core operational costs, and / or identified gaps in management in core protected areas, with less focus on project based funding.

- Payment for Environmental Services (including carbon sequestration) should be established as a mechanism to provide financing and financial sustainability for protected areas management.
- 4. Limited formal, structured and legally valid agreements between GOB authorities (Forest & Fisheries Departments) and civil society partners (NGOs and CBOs) in conservation, hindering effective management of protected areas. The roles and responsibilities of the agencies have not been adequately defined, and the lack of security of investment limits the fund-raising scope of the co-managers. This also results in the general public having a limited understanding regarding the status, roles and management of co-managed protected areas.

Recommendations:

Support from the co-managers in managing protected areas should be strengthened through:

- The adoption of the proposed new Co-management Agreement, and increased awareness of and compliance with the roles and responsibilities therein.
- Strengthen Community Based Organizations and new co-managers through capacity building mechanisms, with increased technical support from GOB Authorities for weaker co-management bodies.
- Strengthened monitoring of management effectiveness to inform and guide oversight and direction by the relevant authorities in their support of comanagers.
- A national public awareness campaign by GOB, re-affirming its commitment to the NPAS, the national benefits derived from it, and recognizing the roles and responsibilities of the co-managers.
- 5. Limited Government Support for progress in system-level planning & management has been made since the 2006 assessment, under collaborative GOB / NGO initiatives. These initiatives, including 3 conservation action plans (for the Maya Mountains Massif, the Maya Mountains Marine Corridor, and the Southern Belize Reef Complex), have increased collaboration amongst management authorities, agencies and other stakeholders, and set in place processes to reduce duplication of effort and establish system level goals and activities. The GOB Golden Stream Watershed Initiative, implemented by the Ya'axché Conservation Trust (in partnership with Fauna & Flora International) has made significant progress in developing system level standards for management tools, and made system-level investments in infrastructure, linking

conservation and sustainable development through an integrated land management approach.

Recommendations:

- GOB authorities (Forest Department, Fisheries Department, National Protected Areas Commission) should re-confirm commitment to the implementation of system-level conservation action plans, and take the lead role in the process.
- The proposed structure for system-level management should be fully implemented and made fully operational.
- System-level investments, should be strengthened, as well as site-level investments, bringing benefits across a broader conservation landscape.
- National standards and tools for protected area management should be developed, refined and extended.

6. Decreasing biological connectivity between protected areas

As our understanding of biodiversity needs increases, so does our recognition of the critical need to maintain biological connectivity between the main blocks of protected areas, be they terrestrial or marine. Ongoing dereservation along the periphery of many protected areas (e.g. eastern Sibun Forest Reserve and western Manatee Forest Reserve) is now severely threatening continued biological corridor functionality. The absence of policies or legislation to regulate land-use change within identified biological corridor routes is resulting in increased fragmentation and the likely eventual need to re-create biological corridors that were still largely intact until very recently. Similarly in the marine sector, if fishing pressure between protected areas effectively creates near-dead zones for certain commercial species, then ecological connectivity is lost.

Recommendations:

- Fully adopt and implement the National Protected Area Policy and System Plan, including mandating the National Protected Areas Commission to implement it
- Establish and implement unambiguous land-use policies or legislation to operationalize identified biological corridors

- Strengthen intra- and inter-departmental communication and collaboration to harmonize policy development and implementation to regulate development activities within identified biological corridors
- Strengthen and extend current research on the extent of barriers to biological connectivity between Marine Protected Areas
- Apply the outputs from that research to develop policies / legislation to govern maintenance of marine biological connectivity as appropriate
- 7. Limited integration of Private Protected Areas. The process of formalization, commitment and recognition of Private Protected Areas is not yet standardized or structured. Shipstern Nature Reserve, established in 1987, is Belize's first private protected area and has been considered a *de facto* private protected area for many years yet it has no legal commitment or formal agreement with the Government of Belize. Rio Bravo Conservation and Management Area, another long-established and successful private protected area, has established a memorandum of understanding with the Government of Belize. Gallon Jug is almost certainly Belize's most effective terrestrial reserve in terms of biodiversity conservation, yet it is not considered part of the National Protected Areas System. As prescribed by the NPAPSP, the process of integration and recognition of private protected areas should be formalized and structured as is being addressed by the Belize Association of Private Protected Areas (BAPPA) in collaboration with the Forest and Fisheries Departments.

Recommendations:

- The proposed amendments to the National Parks System Act to recognize and integrate qualifying private protected areas should be passed into law, once approved by the Forest Department and the Fisheries Department,
- BAPPA should lobby and assist owners of key private protected areas to legally commit their reserves through the revised legislation, in collaboration with the Forest and Fisheries Departments, and other partners in conservation.
- The status of biodiversity within all committed PPAs should be assessed, and lessons learnt in successful biodiversity conservation examined for possible application to national protected areas with lower Ecological Integrity scores.

8. Limited preparedness for the predicted impacts from Climate Change

Climate change poses significant and varied threats to the protected area system, has already resulted in severe coral bleaching events, and has arguably been responsible for increased storm events and associated damage to the reef, forest structure, agricultural areas and loss of life. Despite accepted theory and evidence, protected area managers (both marine and terrestrial) remain largely uninformed and unaware of the extent and severity of these predicted impacts, and as such are unprepared for the implementation of mitigation strategies and actions. Whilst the need to identify and maintain resilient reefs has been integrated into marine protected area system to allow species range changes over time has not yet entered conservation planning efforts – thus leaving the long-term viability of species and even ecosystems at increased risk from climate change.

The critical need for maintenance of forest cover on the east-facing slopes of the Maya Mountains Massif to ensure water security for the southern coastal plain is not yet considered a priority in local or national Government.

Recommendations:

- Develop scenarios for the likely impacts of climate change on terrestrial protected areas over the next 25 and 50-year periods, and initiate the process of adaptive management in this regard.
- Increase national awareness of climate change predictions for Belize and the role protected areas will play in the future in the maintenance of critical environmental services such as water security for the people of Belize
- Strengthen capacity amongst marine protected area managers in the field of climate change, its projected impacts and timescales, and mitigation strategies (associated with resilient species, etc.) that should be developed and implemented.
- Strengthen capacity of the terrestrial protected areas system to respond to climate change through increasing awareness of climate change issues and of the mitigation strategies (particularly the importance of connectivity) that should be developed and implemented.

9. Need for strengthening of site-level management

A number of additional specific areas of site-level management have been identified in the assessment as requiring some strengthening:

 Greater focus on the primary mandate of biodiversity conservation\ maintenance of physical features

- Significant strengthening in human resource management, reducing low staff satisfaction, and increasing focus on human resource requirements
- Capacity building and training in use of protected area management tools (management plans, operational plans, biodiversity monitoring, limits of acceptable change/carrying capacity, standard administration practices, conducting socioeconomic surveys etc.) and the use and importance of monitoring and evaluation for measuring success
- Strengthened wildlife identification skills among protected areas staff particularly of key indicator species, with strengthening of biodiversity monitoring programmes, and an increased understanding of the importance of biodiversity monitoring
- Increased integration of participation by local stakeholders in management decisions, even in an advisory capacity

Assumptions, Limitations and Constraints

This assessment is designed to provide information on strengths and weaknesses at the system level, to guide future investments in strengthening of protected area management effectiveness. The overall assessment does not seek to compare one individual protected area with another, nor rate individual protected area managers on their management effectiveness. However, as a self-assessment, it relies on the integrity and knowledge of the individual assessors when completing the assessment form. As the information outputs are also valid at site-level, a series of sub-reports have been produced to facilitate input of the assessment into the adaptive management process at site level. It is important to recognize that the National Management Effectiveness Assessment Tool, as it currently stands, focuses on whether processes are in place, and less on whether these processes are being effectively implemented or are achieving the desired objectives. The results of the assessment clearly support the observation that the two (processes and outputs) do not necessarily go hand in hand. This shortcoming is being addressed in the revision of the assessment tool.

It was found necessary to make a series of assumptions prior to analyzing the data, to ensure standardization across all assessments:

- 1. That the protected areas administered under the Government of Belize have the protection of biodiversity and the involvement of and benefits to local communities as key components to their long term goals, as stated in the NPAPSP
- 2. Where visitation is not permitted (Nature Reserves), exclusion of visitors and management of scientific researchers is sufficient for visitor management, other illegal visitation being covered under enforcement legislation
- 3. That stakeholder participation in management is necessary for all protected areas for long term viability
- 4. That stakeholder recognition of natural resources is essential for the continued viability of the National Protected Areas System, and therefore education and awareness activities are a priority component of management of all protected areas
- 5. That monitoring and evaluation are essential activities in the effective management of all protected areas
- 6. That site-specific patrols and infrastructure, however minimal, are required for the effective management of protected areas
- 7. That all national protected areas are strengthened with the input of an Advisory Committee composed of key stakeholders
- 8. That when conducting biodiversity assessments, all protected area management organizations conduct their assessments to the same, high standards
- 9. Where no information is available for a process indicator³, an indicator is given a default score of '1'

³ From Young et. al., 2005

The Biodiversity Indicators are being used for the first time, and as such, are considered a guide rather than a scientifically accurate national assessment, to be refined to assess management effectiveness in conserving the biodiversity of the protected area. The results for the terrestrial protected areas demonstrated a need to strengthen identification of key species, and understanding of the roles of the protected areas within the landscape context.

Whilst, given the very limited and coarse nature of the data available for the biodiversity indicators (especially for the terrestrial protected areas), a rigorous and comprehensive statistical analysis cannot be supported, the assessment does provide a structured analysis of the available data, giving an overview of the status of biodiversity across the protected areas system. It also provides an opportunity to compare the effectiveness of biodiversity conservation across different management regimes, and across different categories of protection.

The coarse scale of the biodiversity indicators, coupled with significant variations in the capacity of those conducting the self-assessment, limit the ability to compare the biodiversity values per protected area. Additionally, several terrestrial protected area managers did not have access to data on enough species indicators to be able to include the respective protected area in the assessment, and current lack of technical knowledge leads to erroneous application (generally over-generous) of the current scoring system. These observations further demonstrate the need to strengthen the capacity of protected areas managers (Government and co-management agencies) and staff in many areas of biodiversity conservation – from basic identification skills to the effective implementation of the national biodiversity monitoring protocols as they are developed. Access to reliable quantitative and qualitative data from structured biodiversity monitoring, coupled with capacity-building of assessors should reduce the "data-noise" currently resulting from the subjective interpretations of some assessors.

Status of the Biodiversity

Results from the biodiversity assessments have been subdivided into terrestrial and marine, and focus on the status of a number of key indicator species and ecosystems.

The biodiversity indicators for the terrestrial protected areas of Belize a total average score of 2.28 (57.0%, **GOOD**), and those for the marine protected areas score rather better at 2.52 (63.0%, **GOOD**), giving an overall average of 2.41 (60.1%, **GOOD**).

Terrestrial Protected Areas

The terrestrial protected areas average a score of 2.28 out of 4.00⁴ (57.0% - at the lower end of **GOOD**) for the status of the biodiversity - *populations are reduced, but should recover with limited human intervention* (TNC⁵). However, if taken in the context of the historical status ten to fifteen years ago, prior to the current expansion of the human footprint and Guatemalan incursions, these results are not considered to represent the actual significant decline seen across the system over the longer term, and further strengthening of the tool to reflect this is recommended. This is supported by reports of the rapid decline of key species such as white-lipped peccary, which have disappeared from the Gales Point / Manatee area (GPWSCMC, pers. com; Walker and Walker, in prep), and have declined by an estimated 90% in the Chiquibul area, (FCD, pers. com.; N. Bol, pers. com. M. Kelly, pers. com.; Walker and Walker, 2008), indicative of overall trends seen across the protected areas system in the results from this assessment.

Several terrestrial species are identified as at risk of national extinction as a result of illegal extraction from Belize's protected areas. There is therefore an urgent and critical need to strengthen management effectiveness, particularly in surveillance and enforcement, across the entire terrestrial protected areas system.

Species of International Concern average a Status Score of 2.33 (58.3% - **GOOD**), though the Level of Risk to these species is considered **HIGH**, with a score of 1.77 out of a possible 4.00⁶. Two species – the Central American river turtle ('hicatee') and the yellow-headed parrot are both rated as having a **VERY HIGH Level of Risk** by protected area managers, and are considered in danger of national extirpation (Table 14, Table 17).

Species identified as of National Conservation Concern average a Status Score of 2.23 (58.3%), rating as **GOOD**, but also have a **HIGH** Level of Risk, scoring 1.63. Three indicator species rate as

⁴ Scores are out of 4.00

⁵ TNC, 2007. Conservation Action Planning Handbook: Developing Strategies, Taking Action and Measuring Success at Any Scale.

⁶ Level of risk is calculated from the status and trend scores. Risk score: Very High ≤1.00; High >1.00 – 2.00; Medium >2.00 – 3.00; Low >3.00

having a **VERY HIGH Level of Risk**— scarlet macaw, white-lipped peccary and ocellated turkey. The latter two are heavily hunted in the areas in which they occur, and all three have the potential to face local extirpation (Table 15, Table 17).

Marine Protected Areas

Overall, the marine protected areas of Belize average a score of 2.52 (63.0% - **GOOD**) for ecological integrity, defined by the MBRS as *"lying within an acceptable range of variation, even though human intervention may be necessary to maintain it"* (Corrales, 2004) (Table 19).

The marine protected areas are considered to be more effective in the protection of biodiversity from direct anthropogenic impacts, with greater Government investment in staff and biodiversity monitoring, although precipitous declines in marine turtle populations and spawning aggregations have occurred, both prior to and following the establishment of the marine protected areas and associated legislation. Belize's coral reefs are considered to be in declining health, as demonstrated under the Healthy Reefs Initiative assessment, with only 3% of Belize's reefs considered in Good condition, and 0% in Very Good condition, over 140 survey sites (Healthy Reefs, 2008), with the combined impacts of climate change, poor fishing practices and coastal development, against which the management of the marine protected areas is largely defenseless. Loss of live coral cover is severe in Belizean (and global) waters (Healthy Reefs Initiative, 2008, 2009 assessment trend data), with near-extirpation of some species. Even as early as 1998, Glovers Reef Atoll, for example, had experienced a 75% reduction in coral cover, a 99% loss in cover of Acropora spp., and a 315% increase in algae cover (McClanahan & Muthiga 1998). Coral health is considered to have been over-rated in a number of the protected area assessments in terms of impact on coral viability, when compared with these other assessments.

Marine Species of International Concern average a score of 2.22 (55.5% - GOOD), with an average Level of Risk scored as 1.83 (HIGH) (Table 22). The critically endangered goliath grouper and commercially important spiny lobster are both considered as at VERY HIGH risk. Six species – all three marine turtles, the Nassau grouper, queen triggerfish and hogfish – are all rated as at HIGH risk. Species of National Conservation Concern average a similar score of 2.57 (GOOD), with an overall Level of Risk of MEDIUM. Lobster and conch, the two primary commercial species on which Belize's fishing industry is based, are identified as at HIGH risk across the system, with scores of 1.00 and 1.39 respectively (Table 25).

Impacts on the Protected Areas

Impacts across the Terrestrial Protected Areas System

Seventeen key impacts were identified across the terrestrial protected areas. The greatest impacts on the terrestrial protected areas in terms of geographical spread are hunting, logging and transboundary impacts, which affect more than 40% of the 35 protected areas for which there is available data (Figure 4; Table 18).

Impacts across the Marine Protected Areas

A total of eleven key impacts were identified across the marine protected areas of Belize, each impacting at least one, or as many as 11 of the 13 marine protected areas (Figure 11). The greatest national threats were identified as overfishing / illegal fishing, coastal development and tourism impacts (Table 26). It should however be noted that the validation exercise indicates that the impacts from climate change are far greater and more widespread than as assessed by most marine protected area managers – and should have been rated within the top four threats by all protected area managers. The majority of marine protected area managers focus on immediate, visible threats.

National Indicators

Under the National Protected Areas Policy and System

Plan, management effectiveness is evaluated through the **Monitoring Package for Assessing Management Effectiveness of Protected Areas** (Young et. al. 2005), based on seven different indicator categories:

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

Critical terrestrial pressures and threats

High Hunting Logging Transboundary Impacts Fishing Agricultural Incursions Fire Adjacent Land Use Change Visitor / staff security Extraction of NTFP Nestling Theft for Pet Trade Pollution Agricultural Runoff Low Development Impacts

Critical marine pressures and threats



Overall, protected areas in Belize are considered to rate as **MODERATE** in their level of management effectiveness, averaging a score of 2.41 out of a possible 4.00 $(60.3\%)^7$, with a number of protected areas identified as in need of significant strengthening.

It should be noted that the assessment tool, in its current form, focuses on whether management capacity, infrastructure and processes are in place, less so on whether these process are fully implemented, or achieving their objectives, and whether the protected area management is effective in protecting the natural resources and environmental services.

Validation has demonstrated that outputs are not always in line with processes, and that the actual scores for some management areas should be significantly lower – observations that are guiding the revision of the assessment tool.

The results are presented in a number of ways:

- Status of Biodiversity
- Results by Management Category
- Results by Management Regime
- Results by Indicator Category
- Results by Individual Indicator
- Results by Protected Area
- Results of WCPA Global Indicators

⁷ Data was analysed using Microsoft Access

Results by Management Category

Six management categories are recognized by the National Protected Areas Policy and System Plan, and defined by legislation. A seventh category, private protected areas, has also been included within the assessment, for the eight private protected areas recognized by the Government of Belize.

When assessed by management category:

- All management regimes have average ratings of MODERATE, scoring above 2.00 (50.0%)
- Natural Monuments, administered in the most part under an agreement between Forest Department and co-management partners, have the highest management effectiveness rating, at the lower end of VERY GOOD, with an average score of 3.03 (75.7%), reflecting the strong framework of management processes that are in place



- The second highest management effectiveness rating is for the Marine Reserves, managed under the Belize Fisheries Department and, in many cases, a co-management partner, which rate at the top end of **MODERATE**, with an average score of 2.90 (72.5%), reflecting the investment in human resources and equipment, and presence of management processes.
- Protected areas administered directly under the Forest Department rate at the lower end of MODERATE, averaging an overall score of 2.21 (55.3%).
- The strongest management sub-category under the Forest Department is that of the Natural Monuments, which rate as VERY GOOD (the only sub-category to have this rating), scoring 3.02 (75.5%). The weakest management sub-category is that of the Forest Reserves, with an average score of 2.14 (53.5%).

 Private protected areas are also considered to have a level of management effectiveness rated as MODERATE, averaging a score of 2.54 (63.5%)

Results by Management Regime

Six management regimes are recognized under the assessment, defined by the structure of the different management partnerships, from direct management by Government entities to comanagement partnerships with NGOs and CBOs and logging concession agreements.



When assessed by management regime:

- Protected areas managed directly under the Fisheries Department have the highest average management effectiveness score - 3.02 (75.4%), rating as VERY GOOD, reflecting the Government investment in staff, equipment and operational costs
- Protected areas managed directly under the Forest Department have the lowest management effectiveness score - 1.74 (43.4%), rating as FAIR, reflecting the limited investment from central Government
- Protected areas managed through co-management agreements between NGOs/CBOs and the Fisheries Department rate as MODERATE in their level of management effectiveness, averaging a score of approximately 2.79 (69.7%). There is little difference

between NGO co-management partnerships (which score 2.79) and that with a CBO (2.78), reflecting the level of support co-management partners receive from the Fisheries Department.

Protected areas managed through co-management agreements between NGOs / CBOs and the Forest Department differ greatly. Management effectiveness of protected areas under NGO co-management average at the higher end of MODERATE, with a score of 2.91 (71.8%). Co-management with CBOs rates as FAIR, with an average score of 1.98 (49.4%).

Results by Indicator Categories

Seven Indicator Categories provide the framework for the management effectiveness assessment. All Indicator Categories fall between 2.00 and 3.00, rating as MODERATE. No Indicator Category rates as VERY GOOD.



The strongest Indicator is identified Category as Governance, with a score of 2.76 (69.0%). However, the assessment tool in its current form is not considered to adequately evaluate governance - whilst weak central governance poses one of the greatest threats to the National the Protected Areas System, indicators for governance are focused on site level governance, indicating far stronger governance at system level than is the reality.

The weakest Indicator Category is identified as Participation, Education and Socio-Economic Benefit, with a score of 2.14 (53.6).

Indicator Categories

Poor: ≤ 1.00	Fair: > 1.00 - 2.00
Moderate: >2.00 – 3.00	Very Good: >3.00

Results by Individual Indicators

Sixty-four Indicators are used to provide data for the management effectiveness assessment, organized into the seven Indicator Categories.

Strengths of Belize's Protected Areas System

Six indicators score as **VERY GOOD** (4.00) - the strengths of the protected areas in Belize lie in the strong legislative

Indicator	Score	%
2.1 Legal: Legal Status	3.80	95.0
5.3 Administrative Autonomy	3.22	81.0
2.2 Legal: Boundary Survey and Demarcation	3.03	76.0
7.3 Financial Management	3.02	75.0
5.1 Protected Areas Objectives	3.00	75.0
5.5 Operating Procedures: Board of Directors	3.00	75.0

framework under which the protected areas are established, and on the donor-driven focus over the last five years on improving the administrative framework – organizational structure and capacity of management / co-management organization, financial management and operating procedures.

However:

2.1 Legal: Legal Status: The Indicator does not reflect the ease of de-reservation.

5.3 Administrative Autonomy: This level of autonomy may present challenges, resulting with greater oversight and coordination needed.

7.3 Financial Management: The indicators reflect presence of processes, not actual management outputs – which validation shows to be considerably lower.

Areas Requiring Strengthening

Twelve indicators rate as **FAIR** or **POOR**, scoring 2 or below, and are therefore identified as requiring significant strengthening. The weakest indicator across the system is Indicator 3.2: Sustainable Use for Economic Benefit.

Indicator	Score	%
3.12 Benefits: Sustainable Use for Economic Benefits	1.38	34.0
3.6 Participation: Local Actors Leading Management	1.52	38.0
5.4 Advisory Committee	1.74	44.0
6.6 Human Resource Assessment	1.79	45.0
4.6 Research Programme	1.84	46.0
1.9 Traditional Knowledge	1.90	48.0
1.12 Scientific Research Activities	1.93	48.0
1.3 Inventory of Archaeological Resources	1.98	49.5
3.9 Existence of Capacity Building Strategy	1.98	49.5
1.6 Inventory: Tenures and Claims	2.00	50.0
2.4 Tenure Claim Conflict Resolution	2.00	50.0
4.2 Operational Planning	2.00	50.0



Indicators (see overleaf)

Ranked Indicators averaged across the protected areas system

Poor: ≤ 1.00	Fair: > 1.00 - 2.00
 Moderate: >2.00 – 3.00	 Very Good: >3.00

Non-Biodiversity Indicators (Young et. al. 2005)				
1. Resource Information	3. Community Participation and Benefits	5. Governance		
1.1 Physical Environment	3.1 Communication Activities	5.1 Protected area objectives		
1.2 Biotic Environment	3.2 Stakeholder Engagement	5.2 Co-management agreements		
1.3 Cultural and Archaeological Resources	3.3 Educational Activities	5.3 Administrative autonomy		
1.4 Social, Cultural, and Economic Context	3.4 Dissemination of Knowledge and Information	5.4 Advisory Committee		
1.5 Resource Use and Occupancy	3.5 Level of Stakeholder Participation in Management	5.5 Board of Directors		
1.6 Tenures and Claims	Benefits	5.6 Inter-organizational mechanisms		
1.7 Conservation Target	3.6 Local Actors Leading Management			
1.8 Systematic Threat Assessment	3.7 Volunteer Activities	6. Human Resources		
1.9 Traditional Knowledge	3.8 Strength of Social Capital			
1.10 Information Management Systems	3.9 Capacity Building Strategies	6.1 Qualified Site Manager		
1.11 Environmental Monitoring Activities	3.10 Socio-Economic Benefits Strategy	6.2 Site Manager Availability		
1.12 Functional Scientific Research Activities	3.11 Extent of Local Economic Benefits	6.3 Administrative Staff Availability		
	3.12 Sustainable Use for Economic	6.4 Technical, Scientific, and Professional Staff		
2. Resource Management	3.13 Employment in activities related to the	Availability		
	protected area	6.5 Operations Staff Availability		
2.1 Legal: Legal Status	3.14 Local Recognition of Protected Area Benefits	6.6 Human Resource Assessment		
2.2 Legal: Boundary Survey and Demarcation		6.7 Training and Development		
2.3 Legal: Permit, and Approval Processes	4. Management Planning	6.8 Staff Satisfaction		
2.4 Tenure Claim Conflict Resolution				
2.5 Guidelines and Best Management Practices	4.1 Management Plan Implementation	7. Financial and Capital Management		
2.6 Natural Resource Management	4.2 Operational Plan Implementation			
2.7 Protection: Surveillance Activities	4.3 Regulation and Zoning Implementation	7.1 Funding Adequacy		
2.8 Protection: Enforcement Activities	4.4 Guidelines and Best Management Practices	7.2 Revenue Generation		
2.9 Visitor and Tourism Management Activities	4.5 Long Term Management Needs Identification	7.3 Financial Management		
2.10 Visitor and Tourism Monitoring Activities	4.6 Program Monitoring and Evaluation	7.4 Infrastructure Adequacy		
		7.5 Equipment Adequacy		
		7.6 Internal Access Adequacy		
		7.7 Signage Adequacy		
		7.8 Maintenance Adequacy		



Indicators

Indicators averaged across the protected areas system

Indicator Sections			
Section One:	Resource Information		
Section Two:	Resource Administration, Management and Protection		
Section Three:	Participation, Education and Socio-Economic Benefit		
Section Four:	Management Planning		
Section Five:	Governance		
Section Six:	Human Resources		
Section Seven:	Financial and Capital Management		

Results per Protected Area

When assessed per protected area, ten protected areas (12.1%) rate as **VERY GOOD**, based on the non-biodiversity indicators, scoring above 3.00 (75%) in terms of overall management effectiveness (Table 29).

Seventeen protected areas (20.5%) are highlighted as either requiring on-site management and/or co-management partnerships, or substantial input in terms of capacity building of comanagement partners, and human and financial resources. A further four (Aguas Turbias National Park, Monkey Caye Forest Reserve, Grants Works Forest Reserve and Aguacate Lagoon private protected area) each score an average of 1.00, with little or no information available. Of these, Aguas Turbias National Park has been identified as in need of significant management strengthening. The other three are highlighted as requiring investigation as to whether they still fulfill a role within the protected areas system, either currently or in the future.



Protected Area

Management Effectiveness per Protected Areas in Belize

Poor: ≤ 1.00	Fair: > 1.00 - 2.00
Moderate: >2.00 – 3.00	Very Good: >3.00



Effectiveness of Biodiversity Conservation Outputs vs. Processes

Relationship between processes and effective biodiversity conservation⁸

Twenty nine protected areas supplied sufficient data for inclusion within this assessment of the relationship between National Indicators (Young et. al., 2005) and Biodiversity Indicators (as

⁸ There is a significant gap in the above results. Those protected areas that have weak management and no monitoring in place had no available data, and are therefore not represented in this assessment, but would be expected to score in the bottom left quadrant.

selected under this assessment). For those protected areas that supplied the biodiversity status data, biodiversity scores have been plotted against the processes score (from the 64 indicators):

- Protected areas falling within the top left quadrant score weakly in terms of management processes, but have moderately healthy biodiversity – these are protected areas that should focus management more on establishing and implementing better management processes
- Protected areas falling in the bottom right quadrant score quite strongly in management processes, but quite weakly in biodiversity status – these are protected areas that should focus management more on strengthening biodiversity status
- Protected areas scoring in the top right quadrant score quite well in both management processes and biodiversity
- No protected areas fall in the bottom left quadrant which would reflect weakness in both areas. This, however, is more a reflection of lack of data, as no data was available for those protected areas with weak management and no biodiversity monitoring in place

The precise position of each protected area's score against another cannot be exact with the resolution of data available, but the plot does show general trends:

- Marine Reserves under the Fisheries Department generally have stronger management processes and better biodiversity scores than those under the mandate of the Forest Department, though this difference may also be a reflection of the need to include ecosystem indicators for the terrestrial protected areas
- Private protected areas generally fall within the ranges of moderate for both management processes and biodiversity, except for Rio Bravo Conservation Management Area that scores very highly in both

Summary Results: Global (WCPA) Indicators

When the individual indicator results are aligned with the six WCPA Conceptual Framework Evaluation Elements, the protected areas system of Belize rates as **MODERATE**, with an overall score of 2.13 (60.3%). No Evaluation Element is rated as **VERY GOOD** (>75%), but neither do any score less than 2.00 (50% - **FAIR / POOR**).



Poor: ≤ 1.00	Fair: > 1.00 - 2.00
Moderate: >2.00 – 3.00	Very Good: >3.00

• The strongest Evaluation Element is identified as Context, with a score of 2.51 (62.7%).

 The evaluation elements in greatest need of strengthening (scoring <55%) are identified as Impacts and Results:

Impacts: the outcomes and the extent to which they achieved objectives – with an overall score of 2.01 (50.1%).

Results: the implementation of management programmes and actions and delivery of products and services such as socio-economic benefits – with an overall score of 2.15 (53.8%).

Under the WCPA framework, the evaluation elements are spread across three broad themes...socio-economic, administrative

and biophysical, with each indicator allocated to an Evaluation Element, and to a theme. Administrative Indicators are identified as the strongest WCPA indicator area, and Socio-Economic Indicators as the weakest, scoring 2.13 (53.2%). In a recent WCPA report (Leverington et. al., 2008), it is suggested that a sound level of management will score 67% or above, indicating that significant strengthening of management effectiveness is needed across Belize's protected areas – particularly in the terrestrial sector.

Evaluation Elements Summarized			
	Average	%	
	Score	effective	
Socio Economic Indicators	2.13	53.2	
Administrative Indicators	2.56	64.2	
Biophysical Indicators	2.32	58.1	
OVERALL	2.41	60.3%	

Biophysical Indicators in this context refers to outputs from the National Management Effectiveness Tool indicators (Young et. Al., 2005), not to the Ecological Integrity indicators for biodiversity status

Despite the development of the NPAPSP, bringing in a framework of processes that addresses many of the weaknesses identified in the 2006 management effectiveness assessment, there has not been a significant improvement in protected area management effectiveness at national level. However, as more protected areas develop management plans, and system-level planning begins to guide site-level activities, a structured framework should gradually come into place within which protected area managers are able to work more effectively.


INTRODUCTION TO THE NATIONAL PROTECTED AREAS SYSTEM

Wildtracks, 2009 1

1. INTRODUCTION TO THE NATIONAL PROTECTED AREAS SYSTEM

Belize has an impressive record of establishing protected areas, with a total of 83 marine and terrestrial reserves, spawning aggregation sites, crown reserve cayes supporting important bird colonies, archaeological reserves, and recognized private reserves. Whilst Belize can claim to have almost 2 million acres of national lands within the terrestrial protected areas system and over 620,000 acres of marine environment, there has been no comprehensive analysis of management effectiveness to date across the entire system, and no indication of the conservation status of these protected areas.

At one end of the scale are areas considered as functional conservation units with the structure and human resources to meet many of their objectives and goals. At the other end of the spectrum are reserves that lack on-site management, presence or infrastructure, and can only be considered as 'paper parks^{9'} within the system – those not fulfilling the objectives for which they were established, and characterized by reduced levels of natural resources, illegal incursions for natural resource extraction, land clearance and settlement. Without an understanding of broad scale barriers to management effectiveness, it is challenging for the Forest and Fisheries Departments, the two authorities/administrative bodies, to identify and coordinate strategies to strengthen the protected areas system under their mandate. Assessing management effectiveness is an essential part of the

management cycle, providing this understanding at the national level, whilst also enabling site-level managers to focus on site level management areas requiring further input and focus.

This review covers the 49 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 11 spawning aggregation sites, 7 bird colonies and 8 private protected areas recognized under the National Protected Areas System These encompass nine different categories, dependent on the protected area category under which they are designated. Of these, two protected areas under the Forest Department (Grants Works and Monkey Caye Forest Reserves), and one private protected area (Aguacate Lagoon), are considered to no longer perform their function within the system, with a default score of 1.00 overall. A fourth protected area – Aguas Turbias National Park – also scores 1.00, and will need significant strengthening to be effective in fulfilling its role.

Protected Area Categories

Forest Department

- Forest Reserves (17)
- National Parks (17)
- Natural Monuments (5)
- Nature Reserves (3)
- Wildlife Sanctuaries (7)

Fisheries Department

- Marine Reserves (8)
- Spawning Aggregations (11)

Other

- Bird Nesting Colonies (7)
- Private Protected Areas (8)

⁹ Definition of paper park: "A legally established protected area where experts believe current protection activities are insufficient to halt degradation." (WWF, 2009)



1.1 National Protected Area System Framework

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.



1.2 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 under the mandate of the Forest Department established for extractive use, with several being managed for timber extraction under long term (40 year) license agreements.

The seven Bird Sanctuaries 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).

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.

Forest Reserves

For the protection of forests for management of timber extraction and / or the conservation of soils, watersheds and wildlife resources

Seventeen Forest Reserves were identified under the NPAPSP (Meerman, 2005), of which five are managed directly by the Forest Department, nine are managed through long-term logging concessions, one is managed under a co-management agreement (lapsed) and two are considered to be defunct. (Table 1).

Table 1: Forest Reserves					
Name	IUCN Category	Gazetted	Management / Co-Management Partner	Acres	
Caye Caulker	VI	1998/28	FAMRACC (Lapsed)	94	
Chiquibul	VI	1995/54	Bull Ridge Company / FD	147,823	
Columbia River	VI	1997/115	FD	148,303	
Deep River	VI	1990	Gomez and Sons / Wood Depot / FD	67,305	
Fresh Water Creek	VI	2001/66	FD	33,393	
Grants Works	VI	1989/95	FD (Considered Defunct)	7,906	
Machaca	VI	1998/86	FD	3,096	
Manatee	VI	1959	FD	103,908	
Mango Creek (1)*	VI	1989/62	Wood Depot / FD	10,803	
Mango Creek (4)	VI	1989/62	Wood Depot / FD	19,072	
Maya Mountain	VI	1997/114	Sellars / FD	41,730	
Monkey Cay	VI	1996/130	FD (Considered Defunct)	1,654	
Mountain Pine Ridge	VI	2000/112	Pine Lumber Company / FD	106,353	
Sibun	VI	1977	Madera Development Group / FD	106,393	
Sittee River	VI	1977	New River Enterprises / FD	92,317	
Swasey-Bladen	VI	1989/90	Yong/FD	14,779	
Vaca	VI	2003/137	FD	34,887	

*Mango Creek (3) and Mango Creek (4) were identified by the Forest Department as no longer contributing towards the protected areas system during the 2006 assessment. This assessment confirms this.



Map 2: Terrestrial Protected Areas managed under the Forest Department

National Parks

For	the	protection	and	preservatio	n of	natural	and	scenic	values	of	national	significance	for	the
ben	efit d	and enjoym	ent o	f the genera	l pul	blic								

Table 2: National Parks					
Neme	IUCN	Carattad	Management /		A
Name	Category	Gazetted	Co-Management Partner		Acres
Aguas Turbias	II	1994/44	Forest Department		8,750
Bacalar Chico	V	1996/89	Green Reef	Prosp*	11,145
Billy Barquedier			Steadfast Tourism and		
	II	2001/176	Conservation Association		1,639
			(STACA)	Lapsed	
Chiquibul		1995/55	Friends for Conservation and		264 003
		1555755	Development	Current	204,003
Five Blues Lake		1994/52	Friends of Five Blues Lake		4 061
		1004/02	National Park	Lapsed	4,001
Gra Gra Lagoon	II	2002/86	Friends of Gra Gra Lagoon	Lapsed	1,320
Guanacaste	II	1994/46	Belize Audubon Society	Current	58
Honey Camp	II	2001/65	Forest Department		7,772
Laughing Bird Caye		1996/94	Southern Environmental		10 120
		1550/54	Association	Interim	10,120
Mayflower Bocawina		2001/139	Friends of		7 854
		2001/100	Mayflower/Bocawina	Prosp*	7,004
Monkey Bay	II	1994/45	Guardians of the Jewel	Prosp*	2,122
Noj Kaax H'Men Elijio		2001/177	Itzamna Society / BDF		12.657
Panti				Prosp*	,,
Payne's Creek			Toledo Institute for		
	II	2004/149	Development and		36,421
			Environment (TIDE)	Current	
Peccary Hills			Gracie Rock Reserve for		
			Adventure, Culture and Eco-	D	10,744
		4004/44	Tourism (GRACE)	Prosp*	
		1994/41	Friends of Rio Blanco	Lapsed	94
Sarstoon-Temash		1001/12	Sarstoon Temash Institute		44.055
		1994/42	for Indigenous Management	Lawaad	41,855
St. Hormon's Plus Hole	<u>н</u>	1096/100	(SATIIIVI) Rolizo Audubon Society	Lapsed	665
St. Herman S Blue Hole	II	1980/109	Belize Audubon Society	Current	665
Prospective co-manageme	ent organisa	uon			

Of the seventeen National Parks administered under the Forest Department, four are managed under current agreements signed with full co-management partners, seven are managed under lapsed co-management agreements, and one is managed under an interim agreement. Six of the remaining seven are currently under FD management, with organizations expressing interest in taking on the role of co-management. Two National Parks (Aguas Turbias and Honey Camp) remain under Forest Department management, with no prospective co-managers (Table 2). Laughing Bird Caye National Park – is assessed

as a marine protected area. Signing of co-management agreements has been postponed, awaiting the new co-management agreement currently being developed, so few co-managers have the security of current agreements.

Natural Monuments

For the protection and preservation of national features of national significance

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

Table 3: Natural Monuments						
Name	IUCN Category	Gazetted	Management / Co-Management Partner		Acres	
Actun Tunichil Muknal	la	2004/15	Belize Audubon Society / IoA / FD	Current	457	
Blue Hole	Ш	1996/96	Belize Audubon Society / FD	Current	947	
Half Moon Caye	П	1982/30	Belize Audubon Society / FD	Current	9,771	
Thousand Foot Falls	Ш	2004/79	FD		1,290	
Victoria Peak	III	1998/47	Belize Audubon Society / FD	Current	4,841	

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 (Table 4). Two of these are under co-management agreements – one with Belize Audubon Society (Tapir Mountain), and one, Bladen, with an interim co-management agreement with Ya'axché Conservation Trust. The third, Burdon Canal, currently has no co-management partner, and is considered a paper park.

Table 4: Nature Reserves					
Name	IUCN Category	Gazetted	Management / Co-Management Partner		Acres
Bladen	la	1990/66	Ya'axché Conservation Trust	Interim	99,674
Burdon Canal	la	1992/88	FD		5,255
Tapir Mountain	II	2004/15	Belize Audubon Society	Current	6,300

Wildlife Sanctuaries

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

There are seven Wildlife Sanctuaries within the protected areas system (Table 5), 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 5: Wildlife Sanctuaries					
Protected Area Name	IUCN Category	Gazetted	Co-Management Partner		Acres
Aguacaliente	IV	1998	Aguacaliente Management Team	Prosp*	5,468
Cockscomb Basin	IV	1997/113	Belize Audubon Society	Current	122,260
Corozal Bay	IV	1998/48	Sarteneja Alliance for Conservation and Development (SACD)	Prosp*	180,508
Crooked Tree	IV	1984/95	Belize Audubon Society	Current	36,479
Gales Point	IV	1998/92	Gales Point Wildlife Sanctuary Community Management Committee	Prosp*	9,097
Spanish Creek	IV	2002/87	Rancho Dolores Development Group	Prosp*	6,001
Swallow Caye	IV	2002/102	Friends of Swallow Caye	Lapsed	8,972
*Prospective co-management organisation					

Bird Sanctuaries

For the protection of nationally important bird nesting colonies

Seven Bird Sanctuaries have been established under the Lands Act for the protection of key bird nesting and roosting sites (Table 6). These are not fully integrated into the National Protected Areas System, unless located within or near an active protected area.

Table 6: Bird Sanctuaries				
Protected Area Name	Gazetted	Status		
Monkey Caye	1977	Mixed species colony. No management. Current status unknown		
Little Guana Caye	1977	Just south of the Corozal Bay Wildlife Sanctuary southern boundary. Interest in management from Green Reef/SACD (Green Reef produced a		
Los Salones	1977	Management Plan in 1999). Included in SACD patrol route. Colonies still active. Current conflict with Los Salones, which has recently been granted to a private owner.		
Bird Caye	1977	Mixed species colony situated in Northern Lagoon. GPWSCMC have voice		
Un-Named	1977	capacity for effective management. Colonies still active		
Man of War	1977	Frigatebird colony managed by BFD as part of South Water Caye Marine		
		Reserve. Included in current management plan (2009). Colony still active		
Dubloon Bank	1977	Woodstork colony on caye in inland lagoon surrounded by private land		
		(Philip de la Fuente). Current status unknown		



Map 3: Crown Land Bird Sanctuaries

1.3 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 review of management effectiveness 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) (Table 7).

Table 7: Marine Protected Areas in Belize					
Protected Area	Mgmt. / Co-mgmt	IUCN Category	SI	Area (Acres)	
Bacalar Chico National Park & Marine Reserve	Fisheries Dept.	IV	88 of 1996	15,766	
Blue Hole Natural Monument	Forest Dept. / BAS	===	96 of 1996	1,023	
Caye Caulker Marine Reserve	Fisheries Dept. / FAMRACC	VI	35 of 1998 ²	9,670	
Corozal Bay Wildlife Sanctuary	Forest Dept.	IV	48 of 1998	180,509	
Gladden Spit and Silk Cayes Marine Reserve	Fisheries Dept. / Friends of Nature	IV	95 of 2003	25,978	
Glover's Reef Marine Reserve	Fisheries Dept.	IV	70 of 1996	86,653	
Half Moon Caye Natural Monument	Forest Dept. / BAS	Ш	30 of 1982	9,771	
Hol Chan Marine Reserve	Fisheries Dept.		57 of 1987 ²	3,813	
Laughing Bird Caye National Park	Forest Dept. / Friends of Nature	II	94 of 1996	10,119	
Port Honduras Marine Reserve	Fisheries Dept. / TIDE	IV	9 of 2000	100,000	
Sapodilla Caye Marine Reserve	Fisheries Dept / TASTE	IV	117 of 1996	38,594	
South Water Caye Marine Reserve	Fisheries Dept.	IV	118 of 199610	117,875	
Swallow Caye Wildlife Sanctuary	Forest Dept. / FOSC	IV	102 of 2002	8,972	

¹⁰ Revised, 2009

The Fisheries Department has the mandate to sustainably manage and develop Belize's fishing sector, under the Fisheries Ordinance, Chapter 133, of 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 these are managed directly by the Fisheries Department, as Marine Reserves, whilst the remaining three are managed with co-management partners. Marine Reserves established under the Fisheries Department have clear 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) – the majority of the sites known within Belize waters (Table 8). 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.

Table 8: Spawning Aggregation Sites Protected under SI 161 of 2003					
Protected Area	Location / Affiliated Management Unit	Adjacent to / within MPA	Area (Acres)		
Rocky Point	Bacalar Chico Marine Reserve / BFD / Green Reef	Yes	1,402		
Dog Flea Caye	Turneffe / BFD	No	1,424		
Caye Bokel	Turneffe / BFD	No	1,402		
Sandbore	Lighthouse Reef / FD / BAS	No	1,288		
South Point Lighthouse	Lighthouse Reef / FD / BAS	No	1,378		
Emily / Caye Glory	South Water Caye Marine Reserve / BFD	No	1,351		
Northern Glover's	Glover's Reef / BFD	Yes	1,779		
Gladden Spit	Gladden Spit and Silk Cayes Marine Reserve/ BFD/SEA	Yes	1.280		
Rise and Fall Bank	Sapodilla Cayes Marine Reserve / BFD / SEA	Yes	4,250		
Nicholas Caye	Sapodilla Cayes Marine Reserve / BFD / SEA	Yes	1,664		
Seal Caye	Sapodilla Cayes Marine Reserve / BFD / SEA	Yes	1,600		

Five marine protected areas have also been established under the National Parks System Act (1981), and fall under the mandate of the Forest Department (1 National Park, 2 Natural Monuments and 2 Wildlife Sanctuaries). The five marine protected areas under the mandate of the Forest Department are non-extractive, providing full protection to the natural resources under the legislation, with use concentrating on tourism, research and education (Table 9). Zoning within the protected areas is set out

within the site level management plans, as opposed to the legislated statutory instruments used by the Fisheries Department. All five are managed with co-management partners. Forest Department does, however, recognize that in some cases, there has been ongoing traditional use of natural resources, and that this needs to be taken into account during management planning, and is seeking to revise the legislation under the NPAPSP to permit such activities, if properly regulated and monitored.

Table 9: Marine Protected Areas Categories under the National Parks System Act				
Category	Purpose	Permitted Activities		
National Park Laughing Bird Caye National Park	for the protection and preservation of natural and scenic values of national significance for the benefit and enjoyment of the general public	Research, education, tourism		
Natural Monument Half Moon Caye Natural Monument Blue Hole Natural Monument	for the protection and preservation of natural features of national significance.	Research, education, tourism		
Wildlife Sanctuary Corozal Bay Wildlife Sanctuary Swallow Caye Wildlife Sanctuary	for the protection of nationally significant species, biotic communities or physical features.	Research, education, tourism		

The marine protected areas and protected spawning aggregation sites are spread across Belize's portion of the Mesoamerican Barrier Reef System, from Corozal Bay Wildlife Sanctuary and Bacalar Chico Marine Reserve in the north to Port Honduras Marine Reserve and Sapodilla Cayes in the south (Maps 1 and 2). They cover a range of ecosystems (Map 3), with the majority of the protected areas providing protection to representative coral reef and seagrass, whilst Corozal Bay Wildlife Sanctuary is more representative of the shallow coastal estuarine systems, important as nursery areas for commercial finfish species, elasmobranches and West Indian manatee.



Map 5: Location of Marine Protected Areas of Belize



Map 6: Location of Protected Spawning Aggregation Sites of Belize



Map 7: Broad Ecosystems of Marine Protected Areas of Belize

1.4 Private Protected Areas

Officially Recognized Private Protected Areas

Eight private protected areas are currently recognized as part of the National Protected Areas System (Table 10). Of these, Aguacate Lagoon was the only non-participatory private protected area, the management group expressing little interest in being part of the National Protected Areas System.

Table 10: Private Reserves					
Name	IUCN Category	Management Body	Acres		
Aguacate Lagoon ¹¹	IV	Spanish Lookout	284		
Block 127	IV	TIDE	9,232		
Community Baboon Sanctuary	IV	Private	12,980		
Golden Stream	IV	Ya'axché Conservation Trust	15,038		
Monkey Bay	IV	Private	1,150		
Rio Bravo C&MA	IV	Programme for Belize	259,206		
Runaway Creek	IV	Birds Without Borders /ASF	7,124		
Shipstern Nature Reserve	IV	ITCF	20,332		

It should be noted that many of these recognized Private Protected Areas have no formal or legal commitment to remain under conservation management (the exception being Rio Bravo Conservation and Management Area, which has a formal Memorandum of Understanding with Government). There are also other private landholdings critical to the National Protected Area System, that 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, and is being facilitated by the Belize Association of Private Protected Areas (BAPPA) and Ya'axché Conservation Trust.

¹¹ Non participatory and recommended for removal as a recognized Private Protected Area.



Map 4: Recognized Private Protected Areas

1.5 System Level Management

Whilst to date, the management of the majority of the protected areas has been at site-level, several protected area managers have recently increased collaboration through participation in the development of system-level Conservation Action Plans. These recognize that resources exist in a larger landscape beyond the boundaries of the protected areas themselves, and set out discrete goals and objectives at system rather than site-level, increasing management effectiveness through the development of mechanisms for collaboration for surveillance and enforcement and biodiversity monitoring, protection and management. Three such system-level units are currently being established to increase management effectiveness by reducing overlap and maximizing on synergies (Table 11; Maps 5, 6, 7, 8). The Southern Belize Reef

Complex (Map 8) encompasses South Water Caye Marine Reserve, Gladden Spit and Silk Cayes Marine Reserve, Laughing Bird Caye National Park and Sapodilla Cayes Marine Reserve, transcending administrative categories. The Maya Mountain Marine Corridor is also based on





landscape connectivity, but focuses on watershed functionality and incorporates both terrestrial and marine components. The Maya Mountain Massif is focused on the fourteen protected areas of the forested mountains.

System Level Management Unit	Protected Areas			
Maya Mountains Massif Total number of pas: 14 Total pa area: 1,260,800 Total landscape area:1,260,800 acres	Bladen Nature Reserve; Chiquibul Forest Reserve; Chiquibul National Park; Cockscomb Basin Wildlife Sanctuary; Columbia River Forest Reserve; Deep River Forest Reserve; Maya Mountain Forest Reserve; Mountain Pine Ridge Forest Reserve; Noj Kaax Me'en Elijio Panti National Park; Sibun Forest Reserve; Sittee River Forest Reserve; Victoria Peak Natural Monument; Vaca Forest Reserve; (also includes Caracol Archaeological Site / IoA)			
Maya Mountain Marine Corridor Total number of pas: 10 Total pa area: 619,933 acres Total landscape area:729,630 acres Total seascape area:100,000 acres	Bladen Nature Reserve, Cockscomb Basin Wildlife Sanctuary, Columbia River Forest Reserve, Payne's Creek National Park, Deep River Forest Reserve, Golden Stream Corridor, Block 127, Maya Mountain Forest Reserve, Port Honduras Marine Reserve, Swasey Bladen Forest Reserve (also includes Num Li Punit Archaeological Site / IoA)			
Southern Belize Reef Complex Total number of pas: 4 (including Spawning Aggregation Sites Total pa area: 182,447 acres Total seascape area:779,682 acres	Laughing Bird Caye National Park; South Water Caye Marine Reserve, Gladden Spit and Silk Cayes Marine Reserve, Sapodilla Cayes Marine Reserve Spawning Aggregations: Rise and Fall Bank, Nicholas Caye, Seal Caye, Gladden Spit Bird Sanctuary: Man O' War Caye			
Total Area: 2,870,112 acres Total Number of protected areas (PAs): 23 Total Area of protected areas (PAs): 2,063,180 acres				

Table 11: System Level Management Units

Another Landscape-scale planning initiative that has made significant contributions to system-level planning is that of the Golden Stream Watershed Initiative, which has developed system-level standards for management tools, and made system-level investments in infrastructure – linking conservation management with sustainable development through an integrated land management approach in Southern Belize.



Map 6: System Level Planning – Maya Mountains Massif



Map 7: System Level Planning – Maya Mountains Marine Corridor



Map 8: System Level Planning – Marine Protected Areas of the Southern Belize Reef Complex

1.6 International and Regional Commitments

Belize is a signatory to the Convention on Biological Diversity which provides a number of recommended activities for effective conservation by country signatories, including a number specifically relevant to management effectiveness, falling under Goal 4.2 of the Convention of the Parties 7 (COP-7):

- The development and adoption of appropriate methods, standards, criteria and indicators for evaluating the effectiveness of protected area management and governance, taking into account the IUCN-WCPA framework for evaluating management effectiveness, and other relevant methodologies, for adaptation to the Belize context
- The implementation of management effectiveness evaluations of at least 30 percent of Belize's protected areas by 2010, and of Belize's National Protected Areas System (a review of the protected areas under the administration of the Forest Department was conducted in 2006)
- The inclusion of information resulting from the evaluation of protected area management effectiveness in national reports under CBD
- The implementation of key recommendations arising from the effectiveness evaluations, as an integral part of adaptive management strategies

The 2006 national management effectiveness assessment (Walker and Walker, 2006) was aligned with the WCPA framework, to facilitate the integration of the data into the global assessment of protected area management being conducted by IUCN / WCPA, as part of Belize's commitment as a signatory of the CBD.

Belize, as a signatory to the World Heritage Site Convention under UNESCO, is also required to ensure effective management of those seven sites that contribute towards Belize's serial World Heritage Site. UNESCO provides a toolkit based on the WCPA framework to assist country partners in measuring their effectiveness at managing the natural resources.

At the regional level, Belize is also a signatory to a number of conventions and agreements that seek to increase standardization in monitoring methods and indicators between countries in Central America...of relevance to the monitoring of management effectiveness are:

 the Central American Commission for Environment and Development (CCAD), which aims to have a functioning monitoring system in place covering all national protected area systems in Central America by 2010, in line with the Convention on Biological

Diversity (CBD) framework for implementation developed at the seventh Conference of Parties (COP7).

- the Tuxtla I (1991) and Tuxtla II (1996) agreements of regional cooperation between Mexico and the Central American region.
- the Cartagena agreement for the protection of the marine environment in the Wider Caribbean
- the Mesoamerican Barrier Reef System plan (MBRS), a programme of the CCAD, has provided a supporting framework for synoptic monitoring, capacity building and collaborative relationships between marine protected are managers. This programme has also developed a regional monitoring effectiveness tool to which this assessment has been aligned.



ASSESSMENT OF PROTECTED AREAS IN BELIZE

Wildtracks, 2009 27

2.0 Assessing Protected Areas in Belize

Assessing management effectiveness provides a mechanism for protected area managers at national and site level to assess how effective their strategies and management activities are in achieving the goals and the objectives of the protected area. It provides a snapshot of how the protected area system or individual protected area is doing, reviewing strengths and weaknesses, and adapting management strategies towards more effective biodiversity conservation.

2.1 Assessing Management Effectiveness

Protected areas are one of the most important conservation tools available to Belize's efforts towards the goals laid out under the Convention on Biological Diversity. However unless these protected areas are managed effectively, they will not fulfill their objectives of biodiversity conservation, environmental management and the protection of cultural heritage.

The importance of evaluating management effectiveness was identified in the early 1980's, and was included in the IUCN World Conservation Strategy in 1984. More recently, in 1992, it has been recognized by the Fourth World Parks Congress as one of four main global priorities for protected areas. Based on the outcomes of the Congress, the IUCN World Commission on Protected Areas (WCPA) developed a conceptual framework that is now recognized as the international base standard for evaluating management effectiveness (Hockings et. al. 2000). Evaluation of protected area management effectiveness has also been incorporated into the framework for implementation towards biodiversity targets for 2010 by the Conference of the Parties to the Convention on Biological Diversity in 2004, as stipulated in Goal 4.2 (Figure 2; CBD, 2004).

Goal 4.2: To evaluate and improve the effectiveness of protected area management

Target: By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties.

COP-7 Convention on Biological Diversity, 2004

Figure 2

This monitoring system, developed by the Regional Environmental Program for Central America (PROARCA), uses the internationally recognized World Commission on Protected Areas (WCPA) conceptual framework and guidelines, based on the evaluation of effectiveness of planning

elements within the framework – context, planning, inputs, processes, results and impacts. This methodology has been used as a basis in the development of national evaluation programmes for measuring management effectiveness in Costa Rica (1999), Honduras (2000), Guatemala (2001), Nicaragua (2001), Panama (2002), El Salvador (2003) and Belize (2006).

2.2 Past Assessments of Management Effectiveness in Belize

The first system level assessment of management effectiveness in Belize focused on the marine protected areas, and was completed for the Coastal Zone Management Authority and Institute in 2000, (CZMAI, 2000), using the WWF methodology. This identified the legislative background to marine protected area management as being sound, but also identified administrative weaknesses, and a lack of cohesive long-term objectives for management within the marine protected area system as a whole. Overall, the assessment showed that marine protected areas being co-managed by non-Governmental organizations were more effective than those managed by Government, with the recognition of the need for institutional capacity building at Government level – a requirement subsequently largely filled by the Mesoamerican Barrier Reef System programme. This has brought greater cohesion and standardization of procedures to the marine protected areas within Belize, and a standardized management effectiveness monitoring protocol for use by all marine protected areas within the MBRS.

The status of marine biodiversity and the effectiveness of marine biodiversity monitoring has also been assessed more recently (Garcia et. al., 2008) using the results of the MBRS synoptic monitoring programme, and highlighted gaps and opportunities for improving management of the marine protected areas and the marine resources.

During the development of the National Protected Areas Policy and System Plan (NPAPSP), a management capacity assessment was carried out on eight of Belize's protected areas (Launchpad, 2005), the results of which again suggested that focused private agencies and non-governmental agencies with site-specific commitment, and with access to external funding have greater management effectiveness than management from within Government, which has to work with a wider scope of authority, a larger number of priorities and an ever decreasing set of resources. Major gaps identified through this assessment included limited financial planning, limited capacity building systems, and limited mechanisms for resource protection, as well as a lack of consistency of management across the national system.

A number of individual marine protected area managers have also conducted internal assessments of management effectiveness to assist in site-specific adaptive management. The strategic framework provided by the MBRS project for the marine protected areas was referenced in the development of a cohesive management framework under the National Protected Areas System Plan, targeted at addressing many of the recognized weaknesses within

the protected areas system in Belize. This includes a national management effectiveness monitoring programme (Young et. al., 2005), developed under the National Protected Areas Policy and System Plan to provide a standardized framework for monitoring.

The first full assessment of management effectiveness of national protected areas administered under the Forest Department was conducted in 2006 (Walker and Walker, 2006), using the NPAPSP management effectiveness tool (Young et. al., 2005). This preliminary analysis assessed the management effectiveness in each of the seven indicator areas identified by Young et. al. (2005), both at site and national level for those protected areas administered under the Forest Department. The first national assessment conducted using this protocol was considered as a learning process, and a means to test the validity of the indicators for the different protected area categories to assist in improving the protocol. The results of this first assessment did, however, appear to provide a reasonably reliable baseline against which application of future assessments could be compared. The 2006 assessment, which focused only on the protected areas managed by Forest Department, the major limitations to management effectiveness were identified (Table 12).

Identified limitations to effective management		Current Status (2000)
(2006 Assessment)		current status (2009)
1.	Limited recognition of protected area benefits by stakeholder communities, and therefore lack of support	Still a limitation. There has been some improvement, generally due to specific projects targeted at increasing awareness. A number of NGOs, for example, have been working to increase awareness of stakeholder communities of the Maya Mountains Massif, focusing on watershed functionality and water security, and WWF have recently completed a project quantifying the economic benefits of the reef to Belize. Little of this information, however, appears to be assimilated or understood at Government level, resulting in increasing threats to the protected areas system.
2.	Limited finance for adequate staffing, infrastructure and equipment needs, limiting effective management	Still a limitation. The current global economical situation has resulted in fewer funding opportunities for management and co-management organizations in Belize, and the reduction / loss of support from a number of the larger international organizations, which have been key in funding landscape scale funding initiatives. Management organizations still have limited capacity for the development of financing mechanisms from user fees, provision of services, concessions, etc.
3.	Limited biodiversity protection in the majority of protected areas, with an urgent need for strengthening of surveillance and enforcement	Deteriorated. This situation in terrestrial protected areas has deteriorated since the 2006 assessment – game species are being illegally poached throughout most of the protected areas, parrot and macaw chicks are illegally taken and nesting trees destroyed. Most protected area managers are considered to over-rate their effectiveness in enforcement. Few are effective in more than a core area of the pa. For the marine protected areas, apart from some notable exceptions located adjacent to tourism centres, illegal fishing continues in many no-take zones – reducing the effectiveness of the reserves in protecting and replenishing fish stocks.
4.	Limited understanding of protected area managers of conservation planning, how to maximize management planning, and the use and importance of monitoring and evaluation for measuring success	Improved. Broad stakeholder involvement in conservation planning for management plan development has greatly increased understanding amongst NGO and CBO staff and community stakeholders since the 2006 assessment. System level initiatives, such as the conservation planning for the Maya Mountains Marsif, the Maya Mountains Marine Corridor, and the Southern Belize Reef Complex, have further strengthened this area. Several management bodies are now routinely using their management plans in programme and operations development, and measurement of success.

Identified limitations to effective management (2006 Assessment)		Current Status (2009)
5.	The need for capacity building and training for many protected area managers in use of protected area management tools (from operational and management planning to biodiversity monitoring, limits of acceptable change/carrying capacity, standard administration practices, conducting socio-economic surveys etc.)	Improved. There has been significant capacity building in some areas, including development and use of management and operational plans. Training in biodiversity monitoring remains sporadic, focusing mostly on commercial marine fish, bats, birds, and amphibians. Training under the Mesoamerican Barrier Reef System (MBRS) programme has been the most extensive to date. Few organizations have yet reached the level of establishing and implementing limits of acceptable change or carrying capacity. The use of socio-economic surveys, particularly in fishing communities, has increased – but with little coordination, resulting in duplication of effort and survey-fatigue.
6.	Currently, the majority of protected areas are managed re- actively rather than pro-actively	Improved. Whilst this generally remains the case, a significant number of protected area managers are now becoming more pro-active – largely through implementation of management and operational plans, etc. Fire-management, through the use of prescribed burns, is perhaps the clearest example of pro-active management within the terrestrial protected areas.

Table 11: 2006 / 2009 Status Comparison

2.3 Objectives of the 2009 Assessment

This assessment provides an overview of the effectiveness of management all protected areas recognized under the National Protected Areas System – not only those under the mandate of the Forest and Fisheries Departments, but also officially recognized private protected areas., and identifies common strengths and weaknesses across Belize's marine and terrestrial protected areas. It focuses on highlighting the current status of the biodiversity, providing an overview of identified management gaps, and requirements for more effective management and biodiversity protection. It also presents a series of recommendations for short and long term strategic actions at both site and national level, for strengthening protected area management effectiveness within Belize's National Protected Areas System.

2.4 Participants

This review of management effectiveness covers Belize's 13 marine and 44 terrestrial protected areas under the administration of the Fisheries and Forest Departments, as well as private protected areas and crown cayes. Many of these are managed in partnership with co-management agencies, including large NGOs such as Belize Audubon Society, Friends for Conservation and Development, the Southern Environmental Association, Toledo Institute for Development and Environment, and, smaller community-based organizations, such as the Friends of Swallow Caye and the Sarteneja Alliance for Conservation and Development, and long term logging concession holders (Annex 1). All managers and co-managers participated in the assessment workshops, with follow-on meetings where information gaps existed.

2.5 Framework and Methodology

The assessment was conducted through a series of workshops and meetings, held between May and August, 2009, with representatives from the two management authorities and all co-management agencies. Site-level self-assessments were completed by protected area representatives for each of the terrestrial and marine protected areas, to enable evaluation of the status of biodiversity within individual protected areas and across the protected areas system. Information was also collated from protected area reports and management plans, and through meetings with specific protected area managers, staff and stakeholders, to address identified information gaps.

2.5.1 Biophysical Status

Whilst the National Monitoring Tool (Young et. al., 2005) recommends using the TNC Conservation Action Planning (CAP) process to assess the biophysical indicators, this assessment has adopted a simpler methodology – a modified version of the biophysical assessment protocols from the MBRS

Manual for the Rapid Evaluation of Management Effectiveness in Marine Protected Areas of Mesoamerica (PROARCA, 2004) for the terrestrial environment, with additional indicators addressing the status of key species (Annex 4). A similar series of biodiversity indicators¹² were also selected and assessed for each marine protected area, to provide information on the effectiveness of the strategies and activities in conserving the biodiversity values of the individual protected areas (Annex Five). A modified version of the biophysical assessment protocols from the MBRS Manual for the Rapid Evaluation of Management Effectiveness in Marine Protected Areas of Mesoamerica (PROARCA, 2004) was used to assess the biodiversity status of both marine and terrestrial protected areas.

Indicator species were selected based on one or more of the following criteria:

- a) They are species of international concern (appearing on the IUCN redlist)
- b) They are species of national conservation concern
- c) They are critical marine ecosystems
- d) They are considered important indicators under the Healthy Reefs Initiative¹³,
- e) They are considered important commercial species

Once selected, indicators were incorporated into the assessment form (Annex 4), and the form circulated for review prior to the stakeholder workshops. Each protected area manager was then asked to complete the section within the assessment that dealt with the status of the biodiversity indicator species. These were specific to terrestrial or marine protected areas, with additional timber species indicators for Forest Reserves managed under timber concession.

Only those protected area managers with sufficient biodiversity information were able to complete this section¹⁴, so not all protected areas are currently represented within the biodiversity assessment. In a few instances, erroneous species presence was given by managers (and subsequently removed during the validation process), and some protected area managers gave overly generous ratings for some species – ratings that were re-assessed during validation.

The final indicator selection was made based on the level of information available across the system.

 Terrestrial Protected Areas: 17 indicator species (species of concern, commercial species, and species flagged for their touristic importance) were selected to provide an overview of the status of the biodiversity across the terrestrial protected areas

¹² Indicator selection was also based on the amount of data available across the protected areas system per indicator – those with minimal data were removed from the initial list

¹³ developed with additional input from Eden Garcia (University of Belize) and Julie Stockbridge (The Nature Conservancy)

¹⁴ 29 protected areas were considered to have sufficient, valid information for inclusion in the biodiversity assessment

Marine Protected Areas: Twenty one indicator ecosystems and species (species of concern, commercial species, and species flagged for their touristic importance) were selected to provide an overview of the status of the biodiversity across the marine protected areas.

Ecosystem and species indicators
have each been assessed in terms of
broad viability, using a scale of Poor
to Very Good, rated from Poor to
Very Good, allocated a score from 1
to 4 based on this rating (Table (a)),
then expressed as a percentage for
compatibility with other monitoring
tools. Results have been averaged
across the marine and terrestrial
protected areas within which the
indicator has been assessed.Rating
RatingEcosystem and species indicators
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Following the workshop, the data was Table (a): Bi incorporated into the project TNC, 2007) spreadsheet (Excel) per protected area, and analyzed.

indung	00010	1101190 (70)
Very Good. Doesn't need human	Л	N7E%
intervention	4	~13/6
Good : Populations reduced, but		
should recover with limited human	3	>50 – 75%
intervention		
Fair Populations will decline if there	2	>25 - 50%
is no human intervention	2	25 - 50%
Poor Populations are in danger of		≤ 25%
disappearing from the area, even with	1	
human Intervention		

Table (a): Biodiversity indicator rating scale (adapted fromTNC, 2007)

Status Score: The Status Scores for each indicator were averaged across the protected areas within which they occurred. This provided the Status Score, as demonstrated by the indicators of International Concern.

Trend Score: The Trend Score is calculated from the trend data provided by the protected area assessments. These individual scores are then averaged across the system to provide an insight into the system-level trend of the indicator species population.

Level of Risk Score: The Level of Risk Score is calculated by adding the status and trend scores together for each indicator.

Trend	Allocated Score	
Population increasing	+1	
Population stable	0	
Population decreasing	-1	
Population extirpated	n	
from area	-2	

Table (c): Trend Scores

As with the status scoring, it is important to recognize the very limited nature of the data currently available, and the inherent limitations of analysis. Data is inadequate to examine the severity or rate of trends, and much more detailed monitoring data is needed in order to adequately inform adaptive management, but this first attempt to look at the system-level population trends of indicator species does highlight species that are in perilous decline. It should be noted that extirpations largely reflect recent (last 20-30 years) losses, site-level extirpations occurring prior to that period (e.g. the scarlet macaw used to have a far wider geographic range in Belize, Wright, et. al. 1959) are not reflected.

The Level of Risk is then calculated as a simple addition of status and trend scores, highlighting those species considered most at risk, and therefore requiring the greatest conservation effort. The outputs can be designated a 'Level of Risk' based on the following ratings (Table (d)).

Level of Risk	Score
Very High	≤1.00
High	>1.00 - 2.00
Medium	>2.00 - 3.00
Low	>3.00

Table (d): Trend Scores

2.5.2 National Non-Biodiversity Indicators

The management effectiveness assessment uses the **Monitoring Package for Assessing Management Effectiveness of Protected Areas** (Young et. al, 2005) - the national protocol developed under the National Protected Areas Policy and System Plan, including the minor refinements that were made for its implementation in the 2006 assessment). This provides a framework for reporting on progress of protected area management towards achieving the national objective of a functional protected area system, through effective management of the protected areas. It does this through a series of 64 indicators (Figure 3), organized into 7 indicator categories:

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

The protocol makes the assumption that if an organization achieves all management functions, this will automatically result in the desired outcomes, and that strengthening management functions should improve effectiveness, and therefore the probability of achieving the desired outcomes. It is, however, acknowledged that many external factors may also affect management effectiveness over which managers have little or no control. This includes vulnerability to hurricanes, shifts in the socio-economic landscape, climate change impacts and political shifts in focus.
1. Resource Information	4. Management Planning			
 1.1 Inventory: Physical Environment 1.2 Inventory: Biotic Environment 1.3 Inventory: Cultural and Archaeological Resources 1.4 Inventory: Social, Cultural, and Economic Context 1.5 Inventory: Resource Use and Occupancy 1.6 Inventory: Tenures and Claims 1.7 Site Assessment: Conservation Target 1.8 Site Assessment: Systematic Threat Assessment 	 4.1 Management Plan 4.2 Operational Plan 4.3 Regulation and Implementation of Management Zones 4.4 Identification of long term Management Needs 4.5 Program Monitoring and Evaluation 4.6 Research Planning 			
1.9 Traditional Knowledge 1.10 Information Management Systems	5. Governance			
1.11 Environmental Monitoring Activities 1.12 Scientific Research Activities	5.1 Protected Areas Objectives 5.2 Co-Management Agreements			
2. Resource Administration, Management and Protection	 5.3 Administrative Autonomy 5.4 Operating Procedures: Advisory Committee 5.5 Operating Procedures: Board of Directors 5.6 Uptersensities of Machanisms 			
2.1 Legal: Legal Status 2.2 Legal: Boundary Survey and Demarcation	6. Human Resources			
 2.3 Legal: Permit, and Approval Processes 2.4 Tenure Claim Conflict Resolution 2.5 Guidelines and Best Management Practices 2.6 Natural Resource Management 2.7 Protection: Surveillance Activities 2.8 Protection: Enforcement Activities 2.9 Visitor and Tourism Management Activities 2.10 Visitor and Tourism Monitoring Activities 3. Participation, Education, and Socio-Economic 	 6.1 Site Manager Preparation 6.2 Site Manager Availability 6.3 Admin Staff Availability 6.4 Technical, Scientific, and Professional Staff Availability 6.5 Operations Staff Availability 6.6 Human Resource Assessment 6.7 Training and Development Strategies 			
Benefits	7. Financial and Capital Management			
 3.1 Communication Activities 3.2 Stakeholder Engagement 3.3 Educational Activities 3.4 Dissemination of Knowledge and Information 3.5 Participation: Level of Stakeholder Participation in Management 3.6 Participation: Local Actors Leading Management 3.7 Participation: Volunteer Activities 3.8 Participation: Strength of Social Capital 3.9 Participation: Capacity Building Strategies 3.10 Benefits: Extent of Socio-Economic Benefits Strategy 3.11 Benefits: Extent of Local Economic Benefits 3.12 Benefits: Sustainable Use for Economic Benefits 3.13 Benefits: Employment in activities related to the protected area 3.14 Benefits: Local Recognition of Protected Area Benefits 	 7.1 Funding Adequacy 7.2 Revenue Generation 7.3 Financial Management 7.4 Infrastructure Adequacy 7.5 Equipment Adequacy 7.6 Internal Access Adequacy 7.7 Signage Adequacy 7.8 Maintenance Adequacy 			

Figure 3: Indicator Categories and Indicators of the National Monitoring Package (adapted in 2009 from Young et.al., 2005)

2.5.3 Limitations and Constraints

Young et. al. (2005) recommended site level assessment of outcomes should be through use of the 5-S system – an involved process requiring significant technical and biological knowledge of the protected areas, not generally available to protected area managers. This is unrealistic in the context of Belize's terrestrial protected areas at this point, so in 2006, only the management function-based assessment was conducted. This led to a heavy bias reflecting the management capacity of the protected areas being assessed, but with little information on the success of protected area management in achieving goals and objectives of biodiversity conservation and related socio-economic benefit...the outcomes. Whilst providing a general idea of the patterns of relative management effectiveness throughout the protected areas system, the results were therefore not fully representative of the true status, showing protected areas to be more effective than is actually the case when the known levels of incursions for fishing, hunting and other natural resource extraction activities are taken into account

A modified MBRS protocol has been adopted to assess indicator ecosystem and species, as a pilot initiative to investigate whether this protocol can be incorporated into future management effectiveness assessments. This relies on assessors having knowledge of the species they are conserving. Some of the community based organizations, in particular, showed a need for significant capacity building in this area, with even basic wildlife identification skills being limited.

Another limitation linked to this is the limited historical knowledge that managers have of the natural resources, and the limited integration of traditional knowledge of some indicators into management, which limits ability to be able to gauge current status, providing a bias to the trend results – for example, ratings for sea turtles suggest that the status of these threatened species in Belize is relatively good. However, when compared with historical data, populations have crashed to less than 5% of past numbers, with the gradual disappearance of critical nesting sites, and therefore logically rate as Fair. There is a limit to how much support for conducting the assessment can overcome these capacity limitations, and in general the approach during this assessment analysis has been to not include data that is considered too unreliable.

There is also limited understanding of longer term threats. Few protected area managers / co-managers rated climate change amongst the top four threats, indicative of a limited awareness of the scope and severity of that threat, and a focus on short term threats. Where practicable, and with input from the validation process, these perceived erroneous ratings have been identified, validated and adjusted accordingly.

2.6 Alignment to Global Indicators (WCPA)

Each indicator has also been linked to one of the six **evaluation elements** of the World Commission of Protected Areas (WCPA) framework for assessment, developed to encourage international standards for assessment and reporting, and harmonize assessment around the world (Table 13).

Evaluation Element Framework (World Commission of Protected Areas)							
Elements of Evaluation	Explanation	Criteria that are assessed					
Context	Where are we now? Assessment of importance, threats and policy environment	 Significance (Cultural, biological, economic) Threats (Internal, external, resource extraction) Vulnerability (Legal status, demarcation, fragility) National Context (Political) Partners 					
Planning	Where do we want to be? Assessment of protected area design and planning	 Protected area legislation and policy Protected area system and design (comprehensive, representative, connectivity and viability) Reserve design (Viability, connectivity, land tenure, traditional use) Management planning (Clear objectives and management plans, identification of resources) 					
Inputs	What do we need? Assessment of resources needed to carry out management	 Resources of agency (Staff, funds, equipment, infrastructure) Resources of site (Staff, funds, equipment, infrastructure) 					
Processes	How do we go about it? Assessment of the way in which management is conducted	 Suitability of management processes (Maintenance, control and protection, training, education, research, monitoring and evaluation, visitor management, natural resource management, conflict resolution, personnel management, control of budgets and finance) 					
Results	What are the results? Assessment of the implementation of management programmes and actions; delivery of products and services	 Results of management actions (Evaluation of management plan implementation, annual plans, and annual budgets) Services and products (Quantification of goods and services generated by the management process) 					
Impacts	What did we achieve? Assessment of the outcomes and the extent to which they achieved objectives	 Impacts: effects of management in relation to objectives (Qualitative and quantitative impacts, impacts of management plans etc. in relation to the objectives and the management category). 					

Table 13: Evaluation Element Framework (World Commission of Protected Areas)

The World Commission on Protected Areas (WCPA) conceptual framework and guidelines have also been integrated into the indicator set. This output, based on the evaluation of effectiveness of planning elements within the framework – context, planning, inputs, processes, results and impacts – permit the results of this assessment to be directly aligned with other IUCN/WCPA outputs. A number of additional indicators have been added to facilitate the alignment process. This methodology has been used as a basis in the development of national evaluation programmes for measuring management effectiveness in Costa Rica (1999), Honduras (2000), Guatemala (2001), Nicaragua (2001), Panama (2002) and El Salvador (2003).

2.6.1 Alignment with Regional Indicators (MBRS)

The results from the marine protected area assessment have also been aligned to the Regional MBRS indicators from the Manual for the Rapid Evaluation of Management Effectiveness in Marine Protected Areas of Mesoamerica (PROARCA, 2004), for input into the TNC regional assessment of management effectiveness of the Mesoamerican Reef. This is presented in a separate report (Walker and Walker, 2009: Management effectiveness of Marine Protected Areas, Belize, 2009).

2.7 Structure of Outputs

The outputs of this management effectiveness assessment are structured in three sections:

- **Biophysical Status.** Information on the biophysical status of the marine protected areas system and an outline of threats to the biodiversity.
- National Outputs: The outputs from the seven national Indicator Categories following the format of the national Monitoring Package. These are further broken down into the individual indicator results
- WCPA Outputs: Outputs of the national assessment, aligned with the accepted global standard WCPA evaluation elements



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3.0 Results: Biophysical Status

Effective management is reflected by maintained or increased viability of biodiversity and the reduction of impacts. This has been assessed through the selection of key terrestrial and marine ecosystem and/or species indicators, analysed at site and system level, and used as the most direct measurement of effectiveness of management of the protected areas system.

This assessment represents the first attempt to rate the status of biodiversity, and the impacts on it, across both the marine and terrestrial protected areas of Belize – and is therefore the most direct reflection of the effectiveness of the overall management of the protected area system in fulfilling one of its primary mandates: that of biodiversity conservation. The greatest impacts on the terrestrial protected areas in terms of geographical spread are hunting, logging and transboundary impacts, all of which affect more than 40% of the 35 protected areas for which there is available 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.

For the terrestrial protected areas, the impacts of illegal natural resource extraction – particularly hunting, poaching of parrots and macaws, xaté harvesting and fishing - are having profound impacts on biodiversity. It is clear that protected areas system management at both site and system level is not adequately protecting many species, including the Central American river turtle (hicatee), scarlet macaw, white-lipped peccary, ocellated turkey, yellow-headed parrot. National extirpation of some of these species is a distinct possibility within the coming years if the impacts of illegal activities within the protected areas are not addressed more effectively.

3.1 Biophysical Status of the Terrestrial Protected Areas

Overall, the terrestrial protected areas of Belize average a score of 2.37 (**GOOD**) for biodiversity protection. However, 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 does in fact represent a significant decline across the system.

3.1.1 Indicator Species Status

Seventeen indicator species have been selected to provide an overview of the status of the biodiversity across the terrestrial protected areas. These include species of national and international concern, commercial species, species flagged for their touristic importance or as indicators of the impacts of specific threats.

(i) SPECIES OF CONCERN

Of the indicator species included in the assessment, seven are of International Concern (IUCN: Critically Endangered, Endangered or Vulnerable). Species of International Concern average a score of 2.33 (at the lower end of **GOOD**), suggesting the protected areas are reasonably effective for the conservation of these threatened indicator species. However, the averaged level of risk to these species is considered **HIGH**, scoring 1.77 out of a possible 4 (Table 14).

Two of these species, the Critically Endangered Central American river turtle (hicatee) and the Endangered Yellow-headed Parrot both rate as **FAIR**, with scores of 1.52 and 1.71 out of a total of 4.00 respectively, with risk levels of **VERY HIGH**, and are considered in danger of national extirpation in the short to medium term. At the other end of the scale, the Baird's tapir rates as **GOOD**, with a score of 2.92 (73.0%) - only just below the threshold for its population to be rated as **VERY GOOD**.

Table 14: Indicator Species of Inte	ernational Concern	Number pas with data	Overall Status Score	Level of Risk ¹⁵
Critically Endangered				
Central American River Turtle (Hicatee)	ntral American River Turtle icatee) Dermatemys mawii			Very High (0.52)
Endangered				
Geoffroy's Spider Monkey	Ateles geoffroyi	13	2.31	High (1.74)
Yucatan Black Howler Monkey	Alouatta pigra	24	2.75	Medium (2.45)
Baird's Tapir	Tapirus bairdii	24	2.92	Medium (2.57)
Yellow-headed Parrot	Amazona oratrix	14	1.71	Very High (1.00)
Vulnerable				
West Indian Manatee	Trichechus manatus	13	2.62	Medium (2.33)
Great Curassow	Crax rubra	22	2.50	High (1.79)
Average			2.33	High (1.77)

Status Score: Poor ≤1.00; Fair >1.00 – 2.00; Good >2.00 – 3.00; Very Good >3.00 Risk score: Very High ≤1.00; High >1.00 – 2.00; Medium >2.00 – 3.00; Low >3.00

It should however be noted that a further 12 Threatened species (all amphibians: 2 Critically Endangered, 6 Endangered and 4 Vulnerable) were not included as indicator species in this assessment because of uneven distribution of data and capacity of protected area staff to make assessments. These have been assessed separately under the National Amphibian Conservation Action Plan (Walker, in prep.), with most species having populations that are rated as **FAIR** to **GOOD**, but decreasing. Within the protected areas of Belize, these declines are attributed to habitat loss/degradation, and disease (considered symptomatic of agro-chemical pollution).

¹⁵ Level of risk is calculated from the status and trend scores

The status of species of National Conservation Concern rates as **GOOD**, overall, averaging a score of 2.23 (55.8%) (Table 15). However, these indicator species are also considered to have a **HIGH** risk level, scoring 1.63. Three indicator species rate as at **VERY HIGH** risk – the scarlet macaw, white-lipped peccary and ocellated turkey, and are considered in danger of local extirpation in some protected areas - the latter two are heavily hunted in the areas in which they occur.

Table 15: Indicator Specie Concern	Overall Status Score	Overall Rating (%)	Level of Risk	
Scarlet Macaw	Ara macao	1.40	35.0%	Very High (0.54)
White-lipped Peccary	Tayassu pecari	1.73	43.3%	Very High (0.83)
Ocellated Turkey	Meleagris ocellata	1.80	45.0%	Very High (0.91)
Crested Guan	Penelope purpurascens	2.26	56.5%	High (1.54)
Xaté Palm	Chamaedorea ernestii-augustii	2.53	63.3%	High (1.95)
White-tailed Deer	Odocoileus virginianus	2.47	61.8%	High (1.72)
Mountain Mullet	Agonostomus monticola	2.80	70.0%	High (2.00)
Jaguar	Panthera onca	2.87	71.8%	Medium (2.48)
Average		2.23	55.8%	High (1.63)

Status Score: Poor ≤1.00; Fair >1.00 – 2.00; Good >2.00 – 3.00; Very Good >3.00 Risk score: Very High ≤1.00; High >1.00 – 2.00; Medium >2.00 – 3.00; Low >3.00

Overall, the mean scores across the protected areas for each species are considered to provide and accurate reflection of the current situation in Belize. The scarlet macaw is highlighted as the species with the lowest status score (1.40 - FAIR), whilst the jaguar as a top predator scores quite highly at 2.87 (GOOD), as does the Baird's tapir, which scores slightly higher at 2.92. Species impacted by hunting pressure range from FAIR (Central American river turtle ('hicatee'), white-lipped peccary, and ocellated turkey, to GOOD (crested guan, white-tailed deer, and great curassow). None rate as POOR. The xaté palm is rated as GOOD across the system - though it should be recognized that the xaté rating reflects population size and not so much condition.

(ii) TRENDS

Looking at the trends for the species indicators across the protected areas gives an indication of the trend across the landscape (Table 16) – but not the severity/intensity of the trend. It should be noted that extirpations largely reflect recent (last 20 - 30 years) losses, site-level extirpations occurring prior to that period (eg. the scarlet macaw used to have a far wider geographic range in Belize, Wright, et. al. 1959) are not reflected. Site level extirpations have been recorded for the following species: Central American river turtle (hicatee), Geoffroy's spider monkey, black howler monkey, yellow headed parrot and great curassow.

No terrestrial indicator is rated as having overall stable or increasing populations across the protected area system – all have declining populations. The most widespread decline is in the hicatee, with a trend score of -1.00, followed by the white-lipped peccary (-0.90), ocellated turkey (-0.89), scarlet macaw (-0.86) and mountain mullet (-0.80). Populations of species such

Species	Trend ¹⁶
Central American river	
turtle (hicatee)	-1.00
White lipped peccary	-0.90
OcellatedTurkey	-0.89
Scarlet macaw	-0.86
Mountain mullet	-0.80
White-tailed deer	-0.75
Crested guan	-0.72
Great curassow	-0.71
Yellow-headed parrot	-0.70
Xaté	-0.58
Geoffroy's spider monkey	-0.57
Jaguar	-0.39
Baird's tapir	-0.35
Black howler monkey	-0.30
West Indian manatee	-0.29

Table 16: Trend Results

as West Indian manatee and black howler monkey are stable in many areas but with an overall modest decline across the system.

(iii) LEVEL OF RISK

The risk level - the ranked scores of combined status and trend (Table 17) – demonstrate that a species with low population status and decreasing trend is at greater risk than one with a similar population status but with a more stable population. Whilst the current ratings are limited by the accuracy of the individual assessors, the ranking appears reasonable, grouping species as 'Very High Risk', 'High Risk' and Medium Risk'. On this basis, the hicatee and the scarlet macaw stand out as species with low populations in critical decline, followed by white-lipped peccary, ocellated turkey and yellow-headed parrot. Tapir and jaguar are in significantly better positions with more stable populations.

It is very evident that the protected area system is not adequately protecting many species. For many (such as the hicatee, white-lipped peccary, ocellated turkey, crested guan, great curassow and mountain

¹⁶ Scores per protected area are rated as: extirpated = -2, decreasing = -1, stable = 0, and increasing = +1. A mean score across the protected areas system of +1 therefore indicates increasing populations, 0 indicates population stability across the system, -1 indicates population decreases across the system, and a score <-1 indicates significant extirpations across the system

mullet), this is due to illegal poaching of game species within the	Species	Level of
protected areas. For the scarlet macaw and yenow-neaded		Risk
parrot, the declines are due to combined illegal capture for the	Central American river	
pet-trade, and loss of nesting sites - from nest-robbing activities	turtle (hicatee)	0.52
- and fire. The decline of the spider monkey is likely to result	Scarlet macaw	0.54
from a combination of illegal net-trade hurricane impacts (on	White lipped peccary	0.83
forest structure & food sucilability) and senses others con-	Ocellated turkey	0.91
iorest structure & lood availability), and general anthropogenic	Yellow-headed parrot	1.01
disturbance.	Crested guan	1.54
	White-tailed deer	1.72
	Geoffroy's spider monkey	1.74
3.1.2 Impacts across the Terrestrial Protected Areas	Great curassow	1.79
The minery form processes and threats many identified and	Xaté	1.95
The primary four pressures and threats were identified and	Mountain mullet	2.00
deta available for this section of the assessment	West Indian manatee	2.33
	Black howler monkey	2.45
	Jaguar	2.48

3.1.2 Impacts across the Terrestrial Protected Areas

Table 17: Level of Risk Results

2.57

Baird's tapir

(i) Relative Impact across Terrestrial Protected Areas System

A total of 19 key impacts were identified across the terrestrial protected areas of Belize, each impacting at least one, or as many as 25 protected areas (Table 18; Figure 4).

Threat	No. of PAs impacted (of 35)	%	Rating of Extent of Threat
Hunting	25	71.4	Throughout
Logging	16	45.7	(>40-100%)
Trans boundary impacts	16	45.7	(~40-10078)
Fishing	13	37.1	Widocorood
Agricultural incursion	10	28.6	
Fire	8	22.9	(20-40%)
Adjacent land use	7	20.0	Scattered
Security - theft	5	14.3	>10-20%)
Pet Trade	3	8.6	Localized
Pollution	2	5.7	(1-10%)
Agricultural runoff	1	2.9	
Development Impacts	1	2.9	
Gravel extraction	1	2.9	
Hicatee harvesting	1	2.9	
Invasive species	1	2.9	
Looting	1	2.9	
Oil Exploration / Spill	1	2.9	
Pine Bark Beetle	1	2.9	

Table 18: Impact ratings across the terrestrial protected areas



Figure 4: Number of PAs affected by each impact



(ii) Total Pressure and threat scores impacting each terrestrial protected area

Figure 5: Relative Pressure and Threat Impact per Protected Area





Figure 6: Combined Pressure and Threat Score per Protected Area

3.2 Biophysical Status of the Marine Protected Areas

The biophysical status of the pas is based primarily on a series of biodiversity indicators. Whilst a few protected area managers have data available on physical features, there is, however, recent information available for 2008 on indicator species, including results from monitoring programmes used by the marine protected areas – e.g. the MBRS synoptic monitoring programme and the Long-term Atoll Monitoring Project (LAMP) protocol.

When averaged across protected areas and indicators, the data provides an overview of the status of biodiversity (Table 19; Figures 7 and 8). The overall score of **63.0%** equates to the ecological integrity of the marine protected areas as a whole, as defined by the MBRS as **"lying within an acceptable range of variation, even**

Indicator	%
Ecosystems	69.3%
Species of International Concern	55.5%
Species of National Concern	64.2%
Average for Biophysical Indicators	63.0%

Table 19: Biophysical Indicator Scores

though human intervention may be necessary to maintain it" (Corrales, 2004).



Figure 7: Mean scores for Biodiversity Indicators per Marine Protected Area (insufficient data to include Hol Chan and South Water Caye Marine Reserves)



■ Ecosystems ■ Species of International Concern ■ Species of National Concern ■ Average

Figure 8: Biodiversity Indicator scores per Marine Protected Areas

3.2.1 Indicator Ecosystem and Species Status

Twenty one indicators, both species and ecosystems, have been selected to provide an overview of the 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.

(i) ECOSYSTEMS

The four broad-scale ecosystems found within the marine protected areas are coral reef, mangrove, seagrass, and littoral forest. When results are averaged across the protected areas that encompass the relevant ecosystem, the overall rating provides guidance on the status of that ecosystem.

The results demonstrate that of the four ecosystems, the coral reef has the lowest rating, with a default score of 50.0% (following validation), based on a series of related sub-indicators (Table 20). The extent and condition of mangrove, seagrass and littoral forests are considered relatively stable in the majority of the assessments. The highest ecological integrity rating is for seagrass which, except in localized areas where dredging or similar activities occur, is considered by most protected area managers to be **VERY GOOD**. Mangrove, too, rates highly, though more protected area managers note a decreasing trend. Littoral Forest rates at the lower end of **Good**, with many protected area managers rating the general trend as decreasing.

Ecosystems of the marine protected areas	Number of MPAs with data (of 13)	Overall Score	Overall Rating (%)	Overall Rating (MBRS)	Level of Risk*
Coral Reef	11	2.00**	50.0%	Fair	Decreasing
Mangrove	11	3.09	77.3%	Very Good	Stable (6) / Decreasing (3)
Seagrass	12	3.50	87.5%	Very Good	Stable (10) / Decreasing (2)
Littoral Forest	10	2.50	62.5%	Good	Stable (5) / Decreasing (4)
Average		2.77	69.3%	Good	

Status Score: Poor ≤1.00; Fair >1.00 – 2.00; Good >2.00 – 3.00; Very Good >3.00

*Level of risk is calculated from the status and mean trend score per indicator

** Following validation, the original score of 2.42 (60.5%), was designated a default score of 2.00

Table 20: Results for Status of Ecosystems of the Marine Protected Areas

Coral Reef

The following overview of the condition of Belize's coral reefs demonstrates that external forces (including climate change), beyond the control of protected area managers, are having massive and farreaching impacts. These external forces greatly exceed, and largely overshadow, the impacts that can be tackled through site-level management actions. Coral reefs within the marine protected areas scored 50.0%, rating as **FAIR**. Nationally, 63% of reefs in Belize are considered to be 'at risk' (Reefbase, 2005),more or less in line with the regional level of two thirds of wider Caribbean reefs said to be at risk from human activities. However, the more recent Healthy Reefs Initiative identifying only 3% of Belize's reefs as being in good condition, leading to validation and moderation of the results. 11 of the 13 marine protected areas (those that encompass coral reef) have been assessed in terms of their ecological integrity using a series of sub-indicators (Table 21). Whilst eight sub-indicators were initially selected, sufficient information was only considered to be available for rating five of these (it is hoped that future assessments will be able to rate coral reefs on all eight).

Sub-Indicator	Bacalar Chico Marine Reserve	Blue Hole Natural Monument	Caye Caulker Marine Reserve	Gladden Spit and Silk Caves Marine Reserve	Glover's Reef Marine Reserve	Half Moon Caye Natural Monument	Hol Chan Marine Reserve	Laughing Bird Caye National Park	Port Honduras Marine Reserve	Sapodilla Cayes Marine Reserve	South Water Caye Marine Reserve	Total Score	Score expressed as a %
Live coral cover	4*	2	3	2	2	3	2*	2	2	2	3	2.09	52.3
% Recent mortality	4	1	4	3	2	2	2*	3	3	3	2	2.27	56.8
Coral disease prevalence	3	1	4*	3	2	3	2*	3	2	3	4	2.46	61.4
Coral species richness	4*	4	2	3	4	4	2*	3	4	3	4	3.00	75.0
% macro-algal cover	3*	1	3	3	3	2	1*	4	4	4	n/d	2.27	56.8
Coral recruitment	n/d	2	3	3	n/d	2	n/d	3	4	3	n/d	I/D	I/D
Water temperature	n/d	3	3	n/d	2	3	n/d	n/d	2	n/d	n/d	I/D	I/D
Parrotfish biomass	n/d	n/d	n/d	2	n/d	n/d	n/d	2	n/d	2	n/d	I/D	I/D
Average score	2.20	1.80	2.20	2.80	2.40	2.80	1.80	2.80	3.00	2.80	2.60	60	5%
Score as a % (of 4)	55.0	45.0	55.0	70.0	60.0	70.0	45.0	70.0	75.0	70.0	65.0	00.	J /0

*2007 MBRS data from Garcia et. al. 2008. All other scores are for 2008 n/d: no current data

Table 21: Coral Reef Sub-indicators

There has been a general ecological shift on reefs towards algal dominance in recent years, attributed to a number of impacts including a combination of coral diseases and overfishing, the population crash in the herbivorous long-spined sea urchin and other environmental stressors such as sedimentation, pollution and increasing tourism impacts. Indicator scores range from 7% coverage of macro-algae reported from Port Honduras Marine Reserve to 70% in the heavily impacted Blue Hole Natural Monument.

Whilst overfishing of the herbivorous fish was originally considered to play a major role in the decline of reef health, more recently, global climate change has been identified as the biggest contributing factor,

with increasing sea temperatures exacerbated by increased levels of UV radiation and acidification, increasing coral mortality. In more recent years there would appear to be a shift in species composition of structural corals, and subsequent loss to bleaching caused by increased temperatures. Decreasing populations of herbivorous species such as parrotfish are also reducing the reef's natural ability to maintain algal growth within acceptable levels. Large parrotfish are becoming increasingly scarce throughout the marine system as a result of increasing fishing pressure, as fishers shift from the previously overfished species (Mumby, 2009¹⁷)

Maximum levels of coral bleaching reported for 2008 ranged from 3.37% in Glovers Reef Marine Reserve to 59% in Port Honduras Marine Reserve. Even within a single marine protected area, the level of bleaching changes over the year – in Gladden Spit and Silk Cayes Marine Reserve, for example, bleaching levels of 30% were recorded in October 2008, but fell to 2% in January 2009. Whilst coral can recover from bleaching episodes, it does increase susceptibility to disease and potential for mortality. The Belize Barrier Reef experienced mass coral bleaching for first time in 1995 (McField, 1999) and subsequently in 1998, 2005, and 2008. The first event in 1995 resulted in significant bleaching of hard corals, especially *Montastraea annularis,* in the shallow, warmer waters of the forereef.

Recovery after this initial bleaching episode was considered to be good, but in 1998, a second, more severe coral bleaching event occurred, with complete bleaching of almost all plate and head-forming corals down to 21m, making it the worst recorded event to date in Belize. The majority of areas surveyed suffered 50% loss of live coral cover (McField *et. al.*, 2007), with higher losses in some areas on the lagoonal reefs. The percentage of coral colonies showing signs of disease tripled during the same time interval, thought to be related to the stress of bleaching. A high incidence of coral bleaching (40%) was also noted in the Blue Hole Natural Monument, which also rated poorly in other areas such as coral disease prevalence and recent mortality. Analysis of past patterns of coral mortality through core sampling has shown that on a time scale of millennia, these were novel events when viewed over the last 3,000 years (Aronson et. al., 2002).

During 1998, the same year as the catastrophic coral bleaching episode, Hurricane Mitch, at that time one of the most powerful hurricanes on record within the Atlantic Basin, had a significant physical impact on the reefs of central and southern Belize. Major hurricanes can cause significant physical damage, with coral breakage and rolling of large boulder corals, whilst the heavy rains add to sediment run off from the main land and cleared cayes. Although producing negative impacts such as these, Hurricane Mitch also lessened the impact of previous coral bleaching through reducing the water temperatures, with the mixing of the warm shallow waters with the cooler deep waters. Large storms such as these are predicted to increase over the coming years, as a result of climate change.

All these shifts – in fish populations, in coral species dominance, algal growth and water parameters - lead to concerns for the future viability of the coral reef ecosystem from a biodiversity point of view,

¹⁷ Report to the Belize Fisheries Department: Fishing Down the Foodweb (P. Mumby, 2009)

and as an economically important fishing and tourism resource in Belize, increasing the importance for effective management of the marine protected areas.

Seagrass

Seagrass meadows are essential for maintaining the ecological health of the shallow marine ecosystems, with an important role in nutrient cycling, filtration and sediment stabilization. Seagrass is also a critical ecosystem for many fish and invertebrate species. Within the marine protected areas, this ecosystem rates as **Very Good**, and is considered to be stable throughout most protected areas, with only localized impacts. The main exception is Corozal Bay Wildlife Sanctuary, where increasing threats (primarily sedimentation) are thought to have had a major impact on the extent and distribution of seagrass over the years – of significant importance considering the value of this protected area for supporting one of the largest West Indian manatee populations in Belize.

These seagrass beds fill a critical role as a nursery area for the commercially important conch, many reef fish (including commercial species such as tarpon, hogfish, yellowtail snapper and great barracuda), and for the key herbivore guild species assemblages - the parrotfish. Seagrass beds also provide corridors for juvenile lobsters between habitats and, close to cuts in the Barrier Reef, important settlement areas for post-larval stages of commercial species (Acosta, 2001). Epiphytic algae and foraminifera form heavy encrustations of seagrass blades where there is heavy nutrient loading -such as in the naturally eutrophic waters around bird colonies, or in human impacted areas adjacent to poorly designed caye developments.

Re-colonization of disturbed areas by *Thalassia* after removal through dredging or other activities is slow, with scarring of the seagrass beds found in areas where dredging or past seismic testing has occurred, and in shallow areas of high boat activity.

Mangrove Forests

Mangroves occur on both the coastal mainland and cayes within and adjacent to the marine protected areas, and are considered to have a status of **VERY GOOD**, scoring 84.1% on average over the marine protected areas in Belize. Exceptions include Half Moon Caye Natural Monument, where historically, mangrove was cleared from the caye, and Caye Caulker and South Water Caye Marine Reserves, where the mangrove ecosystem is considered to be decreasing in extent and condition. The prop roots of red mangroves are important in their role in the maintenance as a critical fisheries nursery area for commercial fish and lobster stocks. They also play a critical role in the maintenance of caye integrity through erosion control, and serve as structural support for seabird nesting colonies, with the leaves providing nutrients for plankton, serving as the basis of the detrital food chain.

Coastal and caye development is seen as the most significant threat to the integrity of this ecosystem. Historically, fishermen have used many of the mangrove cayes as bases for seasonal fishing camps, for

bait collecting, and for storm shelter, clearing small, temporary or semi-permanent campsites, with only localized impacts. However, since the early 1980s, coastal and caye mangroves have been extensively impacted by development for resorts and vacation homes, significantly increasing susceptibility to storm events. The mangrove ecosystem is fragile, and once clear-cut, it is fundamentally disturbed and exhibits poor regeneration. Although Belize's regulations regarding marine protected areas and mangrove protection should protect mangrove-dominated ecosystems from future threats of development, attempts by the Forest Department to enforce these regulations have been only moderately successful. Many mangrove ecosystems lie on coastlines or cayes, outside the control of protected area managers, yet help maintain the biodiversity of the protected areas - and are still being cleared despite the recognized value of the essential ecosystem services they provide, particularly in the maintenance of fish stocks and erosion control.

(ii) SPECIES OF INTERNATIONAL CONCERN

A series of indicator species have been used to assess how effective the marine protected areas are in their role of maintaining species of international concern (Table 22), with an average a score of 2.22 (**Good**), and an average level of risk scored at 1.83 (**High**). The critically endangered goliath grouper is considered at **Very High** risk, and three species – the Nassau grouper, queen triggerfish and hogfish – are all rated as at **High** risk, as are the marine turtles, subsequent to validation.

Indicator Species of Intern	ational Concern	Overall Status Score	Overall Rating (%)	Level of Risk*			
Critically Endangered							
Goliath Grouper	Epinephelus itajara	1.50	37.5%	Very High (0.87)			
Hawksbill Turtle	Eretmochelys imbricata	1.50**	37.5%	High (1.36)			
Endangered							
Loggerhead Turtle	Caretta caretta	1.50**	37.5%	High (1.30)			
Green Turtle	Chelonia mydas	1.50**	37.5%	High (1.17)			
Nassau Grouper	Epinephelus striatus	2.11	52.8%	High (1.82)			
Vulnerable							
Queen Triggerfish	Balistes vetula	2.50	62.5%	High (2.00)			
West Indian Manatee	Trichechus manatus	2.80	70.0%	Medium (2.80)			
Hogfish	Lachnolaimus maximus	2.22	55.5%	High (1.34)			
Mutton Snapper	Lutjanus analis	2.78	69.5%	Medium (2.28)			
Cubera Snapper	Lutjanus cyanopterus	3.00	75.0%	Medium (2.17)			
Whale Shark	Rhincodon typus	3.00	75.0%	Medium (3.00)			
Average	2.22	55.5%	High (1.83)				
Status Score: Poor ≤1.00: Fair >1.00 – 2.00: Good >2.00 – 3.00: Very Good >3.00							

* Level of risk is calculated from the status and mean trend score per indicator

** Status scores for marine turtles reduced to Fair in validation exercise, to reflect historical declines Original assessment: Hawksbill turtle 2.33; loggerhead turtle 2.43; green turtle 2.80

Table 22: Results for Status of Species of International Concern of the Marine Protected Areas

Two indicator species are considered to be Critically Endangered¹⁸ at global scale - the goliath grouper (*Epinephelus itajara*) and hawksbill turtle (*Eretmochelys imbricata*). The goliath grouper has been a favoured target for the fishing industry in the past, and the current assessment rates it as **Fair**, with a score of 41.8% - the lowest of all assessed species of international concern. All but one marine protected areas show a decreasing trend in the status of goliath grouper.

Hawksbill turtles nest within a number of the marine protected areas, along with loggerhead and green turtles (Table 23). Whilst there has been limited monitoring of nesting success, an increasing number of protected area managers are now including monitoring of turtle nesting sites within their monitoring programmes.

Marine Protected Area / Turtle	Species (2008)	Trend		
Nesting Sites				
Laughing Bird Caye Marine	Hawksbill, Green, Loggerhead turtles			
Reserve		Only data for 2008		
Laughing Bird Caye				
Half Moon Caye Natural	Hawksbill, Green, Loggerhead turtles			
Monument		Increasing ¹⁹		
Southside Beach				
Gales Point Wildlife Sanctuary	Hawksbill, Green, Loggerhead turtles	Decreasing		
Manatee beach (outside the WS)		Decreasing		
Bacalar Chico Marine Reserve	Green, Loggerhead turtles	Decreasing		
Robles		Decreasing		
Glovers Reef Marine Reserve	Hawksbill turtles	Decreasing		
Long Caye		Decreasing		
Glovers Reef Marine Reserve	Hawksbill turtles	Decreasing		
South West Caye		Decreasing		
Glovers Reef Marine Reserve	Hawksbill turtles	Docrossing		
Long Caye, South West Caye		Decreasing		
Port Honduras Marine Reserve	Hawksbill turtles			
Snake Caye, Middle Snake Caye		No data		
Punta Ycacos Beach, Head Caye				
Sapodilla Caye Marine Reserve	Hawksbill turtles. Possibly Green turtles	Stable (but decreased		
Lime Caye, Nicholas Caye		historically)		
Hunting Caye, Franks' Caye		(instorically)		
South Water Caye Marine Reserve	Hawksbill and Green turtles	Stable		
Carrie Bow Caye		Stable		
South Water Caye Marine Reserve	Hawksbill and Green turtles			
South Water Caye, Tobacco Caye,		Decreasing		
Carrie Bow Caye				

Table 23: Turtle nesting sites within the marine protected areas (from individual pa self-assessment forms, 2009)

¹⁸ As rated by IUCN Redlist, 2008

¹⁹ This is a recent increase from the almost complete loss of turtle nesting. It still remains significantly below 1% of historic levels.

Three Endangered species are assessed – the Nassau grouper (*Epinephelus striatus*), and green and loggerhead turtles (*Chelonia mydas* and *Caretta caretta*). Nassau grouper has declined nationally by more than 80% since the late 1970s, attributed primarily to fishing pressure, particularly at the spawning aggregation sites where it is most vulnerable – the majority of the marine protected areas rate this species as **Fair** (populations will continue to decline and eventually disappear if there is no human intervention). With the establishment of spawning aggregation site protection, this species has been closely monitored, and stabilization of some populations has been observed.

Monitoring of selected key spawning aggregation sites since 2003 shows that Nassau grouper aggregations continued to decline until 2008 (Figure 9)²⁰.



Figure 9: Nassau Grouper populations at monitored spawning aggregation sites

Three marine protected areas are monitoring spawning aggregation sites for this species (Table 24), and focus surveillance and enforcement activities on these areas during spawning season. However Emily Caye, another important spawning aggregation site lies outside the marine protected areas, with associated logistical problems for monitoring and enforcement. Other commercial species also rate poorly across the marine protected areas – hogfish (*Lachnolaimus maximus*) and mutton snapper (*Lutjanus analis*) both score below 60%.

²⁰ Two sites were not monitored in 2007, which may have resulted in lower population figures than is actually the case, but both had minimal populations (<10 individuals) in the previous year). Spawning Aggregation Working Group.

The large charismatic species – the Vulnerable West Indian manatee (*Trichechus manatus*) and whale shark (*Rhincodon typus*) both have strong legislated protection (the manatee under the Wildlife Protection Act and the whale shark under the Fisheries Act). They also benefit from being important tourism attractions, with stakeholders being engaged in protection, seeing their value as tourism resources, with populations currently considered stable.

Spawning aggregations throughout Belize have crashed since first targeted by fishermen, and few are showing true signs of recovery, though most are maintaining low numbers. This is reflected in the historical records for Emily Caye/Caye Glory, a spawning aggregation site to the north of South Water Caye Marine Reserve. This site is renowned for highlighting the crash of Nassau grouper (*Epinephelus striatus*), with numbers plummeting from many thousands in the 1950's and 1960's to an estimated 21 in 2001 (Paz and Truly, 2007). Recent monitoring estimates at this site, however, are starting to show a trend of increased numbers of Nassau Grouper, with 3,000 recorded in 2009 (Figure 10; Belize Spawning Aggregation Working Group, 2009). Nicholas Caye, in the Sapodilla Cayes, has also suffered similar unsustainable harvesting. This site was reputed to be one of the largest Nassau grouper aggregation sites in the southern marine area, yet in 2002, only a single grouper was recorded. With continued pressure from trans-boundary fishing incursions, this site continues to show low numbers, with a maximum of 100 individuals recorded at any site during the past ten years. Legislation was enacted in 2002 to initiate protection of the 11 major spawning aggregation sites, though recovery is only just starting to be observed.



Figure 10: Nassau Grouper numbers at spawning aggregation monitoring sites

	Species ²¹		Maximum Nassau Grouper Counts							
Spawning Aggregation Site	Species	2003	2004	2005	2006	2007	2008	2009		
High importance22. High Vulnerab	ility23									
Gladden Spit	Cubera Snapper, Mutton Snapper, Cubera Snapper,									
Gladden Spit and Silk Caye Marine	Yellowtail Snapper, Dog Snapper, Nassau Grouper,									
Reserve	Red Hind, Black Grouper, Yellowfin Grouper, Tiger									
Southern Environmental	Grouper, Amber Jack, Permit, Bar Jack, Crevalle Jack,	250	450	360	239	255	350	260		
Association	Horse-eye Jack, Blue Runner, Yellow Jack, White Margate, Smooth Trunkfish, Hogfish, Jolthead Porgy									
22 species	Ocean Triggerfish									
SI 161 of 2003										
Northern Glover's	Mutton Snapper, Nassau Grouper, Black Grouper,									
Glovers Reef Marine Reserve	Tiger Grouper, Yellowfin Grouper									
The Belize Fisheries Department		2,400	1,700	2,240	3,000	800	1,190	1,100		
5 species										
SI 161 of 2003										
Caye Glory / Emily Caye	Nassau Grouper, Dog Snapper, Red Hind, Black									
The Belize Fisheries Department	Grouper, Yellowfin Grouper, Jolthead Porgy, Permit,									
(Seasonal surveillance from South	Ocean Triggerfish	1 000	1 000	350	7	69	405	3 000		
Water Caye Marine Reserve)		1,000	1,000	550		05	105	3,000		
8 species										
SI 161 of 2003										
Mauger Caye	No data									
Turneffe Atoll										
High Importance, Low Vulnerability	/									
Rise and Fall Bank	Schoolmaster, Dog Snapper, Yellowtail Snapper,									
Sapodilla Cayes Marine Reserve	Nassau Grouper, Red Hind, Black Grouper, Tiger									
Southern Environmental	Grouper, Horse-eye Jack									
Association										
8 species										
SI 161 of 2003										

 ²¹ Heyman et. al., 2002, Heyman et. al., 2003, with additional notes from site level Annual Reports
 ²² Heyman et. al. 2003, based on number of species and individuals
 ²³ Heyman et. al. 2003, based on existing and predicted fishing pressure

Marine Protected Area / Spawning Aggregation Sit <u>e</u>	Species ²⁴	Maximum Nassau Grouper Counts						
Medium Importance, High Vulnera	bility	2003	2004	2005	2006	2007	2008	2009
Nicholas Caye Sapodilla Cayes Marine Reserve Southern Environmental Association 6 species	Nassau Grouper, Tiger Grouper, Black Grouper, Spotted Trunkfish, Yellow Fin Grouper, Red Hind,	52	50	80	48	80	100	25
SI 161 of 2003								
Sandbore Lighthouse Reef Atoll 12 species SI 161 of 2003	Yellowtail Snapper, Nassau Grouper, Black Grouper, Tiger Grouper, Yellowfin Grouper, Permit, Bar Jack, Yellow Jack, Crevalle Jack, Horse-eye Jack, Permit, Smooth Trunkfish	1,800	2,500	1,800	1,205	1,495	1,250	2,050
Caye Bokel Turneffe Atoll SI 161 of 2003	Nassau Grouper, Black Grouper, Tiger Grouper, Mutton Snapper, Cubera Snapper, Dog Snapper, Bar Jack, Horse-eye Jack, Jolthead Porgy, Permit, Smooth Trunkfish							
'El Nic' South Point <i>Lighthouse Reef Atoll</i> 15 species SI 161 of 2003	Mutton Snapper, Dog snapper, Yellowtail Snapper, Nassau Grouper, Red Hind, Black Grouper, Tiger Grouper, Permit, Bar Jack, Blue Runner, Yellow Jack, Crevalle Jack, Horse-eye Jack, Ocean Triggerfish, Black Margate, Jolthead Porgy, Smooth Trunkfish, Blue Tang							
Medium Importance, Medium Vuli	nerability							
Seal Caye Sapodilla Cayes Marine Reserve Southern Environmental Association SI 161 of 2003	No data							

²⁴ Heyman et. al., 2002, Heyman et. al., 2003, with additional notes from site level Annual Reports

Marine Protected Area / Spawning Aggregation Site	Species ²⁵	Maximum Nassau Grouper Counts						
Low Importance, High Vulnerability	ý							
Half Moon Caye	Cubera Snapper, Dog snapper, Schoolmaster,							
Lighthouse Reef Atoll	Yellowtail Snapper, Nassau Grouper, Red Hind, Black							
Belize Audubon Society	Grouper, Tiger Grouper, Yellowfin Grouper, Permit,							
22 species	Amber Jack, Bar Jack, Crevalle Jack, Blue Runner,							
	Horse-eye Jack, Yellow Jack, Black Margate, White							
	Margate, Jolthead Porgy, Ocean Triggerfish, Smooth Trunkfish, Buffalo Trunkfish							
Middle Caye	Nassau Grouper, Black Grouper, Smooth Trunkfish							
Glovers Reef Marine Reserve								
The Belize Fisheries Department								
3 species								
Dog Flea Caye	Nassau Grouper, Black Grouper, Tiger Grouper							
Turneffe Atoll		1 500	100	_	2	n/a	n/a	n/a
3 species		1,500	100		2	Π/a	Πγα	ny a
SI 161 of 2003								
Low Importance, Medium Vulnera	bility							
Rocky Point	Nassau Grouper, Black Grouper, Mutton Snapper,							
Bacalar Chico Marine Reserve	Dog Snapper, Yellowfin Grouper, Tiger Grouper,							
The Belize Fisheries Department	Horse-Eye Jack, Permit, White Margate, Yellow-Tail	-	200	200	0	n/a	0	n/a
10 species	Snapper							
SI 161 of 2003								
Unknown								
South West Caye	Black Grouper, Smooth Trunkfish							
Glovers Reef Marine Reserve								
The Belize Fisheries Department								
2 species								
Soldier Caye	Nassau Grouper, Black Grouper, Tiger Grouper, Bar							
Turneffe Atoll	Jack, Horse-eye Jack, Smooth Trunkfish							
6 species								

²⁵ Heyman et. al., 2002, Heyman et. al., 2003, with additional notes from site level Annual Reports

Marine Protected Area / Spawning Aggregation Site	Species ²⁶	Maximum Nassau Grouper Counts						
Unknown								
Calabash Caye	Yellowtail Snapper, Nassau Grouper, Black							
Turneffe Atoll	Grouper, Permit, Bar Jack, Horse-eye Jack, Permit							
7 species								
Total Nassau Grouper recorded per year		7002	5800	4830	4501	2699	3295	6435

Table 24: Spawning Aggregation Sites and data for Nassau Grouper

(Data: The Belize Spawning Aggregation Working Group Newsletter, 2009; State of Protected Areas Assessment Form, 2009; Heyman et. al. 2002, Heyman et. al, 2003)

²⁶ Heyman et. al., 2002, Heyman et. al., 2003, with additional notes from site level Annual Reports

The Rocky Point site shows a similar past trend - discovered in the early 1980's, 45,000lbs Nassau grouper fillet were reported as landed in the first year. However fishing pressure was so intense that in the third year that no aggregation was formed (Heyman et. al., 2002). Whilst Nassau grouper aggregations were recorded once again in 2004 and 2005, no recent reports have been documented.

A number of other species are also known to use these spawning aggregation sites – mutton snapper (*Lutjanus apodus*), dog snapper (*Lutjanus jocu*), red hind (*Epinephelus guttatus*), black grouper (*Mycteroperca bonaci*), yellowfin grouper (*Mycteroperca venenosa*), tiger grouper (*Mycteroperca tigris*) jolthead porgy (*Calamus bajonado*), and permit (*Trachionatus fulcatus*) among them (Heyman et. al. 2003).

(iii) SPECIES OF NATIONAL CONSERVATION CONCERN

A number of commercial and sport fishing species have been identified as species of national concern (Table 25), averaging a score of 2.57 (**Good**), with an overall Risk Level of **Medium**. Lobster and conch, the two primary commercial species on which Belize's fishing industry is based, rate relatively poorly, and are identified as at highest risk across the system, with scores of 1.00 and 1.39 respectively

Sport fishing species such as tarpon and bonefish, however, rate well – between 75.0% and 78.6% - reflecting the greater stakeholder engagement in protection when addressing species of touristic value.

Indicator Species of National Conservation Concern		Number pas with data (of 14)	Overall Rating	Rating (Score)	Level of Risk*
Yellow tail Snapper	Ocyurus chrysurus	8	2.88	Medium (2.63)	Medium (2.63)
Spiny Lobster	Panulirus argus	10	2.00	Very High (1.00)	Very High (1.00)
Queen Conch	Strombus gigas	8	2.25	High (1.39)	High (1.39)
Permit	Trachinotus falcatus	6	2.71	Medium (2.54)	Medium (2.54)
Bonefish	Albula vulpes	7	3.14	Medium (2.97)	Medium (2.97)
Snook	Centropomus undecimalis	2	2.00	Medium (3.00)	High (2.00)
Tarpon	Megalops atlanticus	6	3.00	Medium (3.00)	Medium (3.00)
Average			2.57	2.22	Medium (2.22)

* Level of risk is calculated from the status and mean trend score per indicator

Table 25: Results for Status of Species of International Concern of the Marine Protected Areas

3.2.2 Impacts across the Marine Protected Areas

The primary four pressures and threats²⁷ were identified and assessed for each marine protected area, resulting in a total of eleven key impacts identified across the marine protected areas of Belize, each impacting at least one, or as many as 11 of the 13 marine protected areas (Figure 11). It should however be noted that the validation exercise indicates that the impacts from climate change are far greater and more widespread than as assessed by most marine protected area managers – and should have been rated within the top four threats by all.



Figure 11: Number of MPAs impacted by each threat

²⁷ Pressures are considered as past direct and indirect negative impacts on the biodiversity, whilst threats are the future potential negative impacts (Ervin, 2003).

In decreasing order of the number and percentage of protected areas impacted, these threats are then rated as being 'Throughout', 'Widespread', 'Scattered' or 'Localized' in their extent across the marine protected area system (Table 26).

Threat	No. of PAs impacted	%	Rating of Extent of Threat
Over fishing / illegal fishing	12	92.31	Throughout
Tourism Impacts	9	69.23	(50-100%)
Coastal Development	7	53.85	(50 100/0)
Pollution	4	30.77	
Climate Change	4	30.77	
Illegal Transboundary Fishing	3	23.08	(20-49%)
Mangrove Clearance	2	15.38	Coattored
Sedimentation	2	15.38	10 10%
Boat Grounding / Oil Spill	2	15.38	10-19%)
Lack of PA infrastructure	1	7.69	Localized
Research Activities	1	7.69	(1-9%)

Table 26: Threat ratings across the marine protected areas

Of the 11 threats, three are seen as being '**Throughout**' in their extent across the system: over fishing / illegal fishing, tourism impacts, and coastal development. Pollution, climate change, and illegal transboundary fishing are assessed as '**Widespread**', impacting three or more of the mpas. Mangrove clearance, sedimentation and boat groundings / oil spills were identified as key threats to two of the protected areas, and are rated as '**Scattered**' across the system. Lack of protected area infrastructure and research activities were identified as key threats to only one protected area, and were therefore rated as being 'Localized' in their extent across the system as a whole.

Geographic spread of threats

Each of the threats that rate as '**Throughout**' the system (poor fishing practices, tourism impacts, and coastal development) and two of the three '**Widespread**' threats (pollution and illegal transboundary fishing) have been identified as impacting the system from Corozal Bay and Bacalar Chico in the north to Port Honduras in the south. This is compounded by illegal incursions from Mexican fishermen from the north into Corozal Bay and Bacalar Chico, and from Guatemalan and Honduran fishermen into Port Honduras in the south.

The third 'Widespread' threat (climate change), whilst only being identified as a key threat by protected area managers in the north and central areas of Belize, is now accepted as a key threat to all marine protected areas, particularly those encompassing coral reef. For many site-level managers, however, more immediate threats are seen as of a greater priority, and are easier to focus on at site-level. At system-level, however, there is a general goal of ensuring that identified resilient reefs are given adequate protection, and within marine reserves, that 30% of the highest-value reefs are placed within the conservation zones.

Weak enforcement, as a threat in its own right, was identified as a key threat in only one protected area (Caye Caulker Marine Reserve) although at least in terms of protection of the fish stocks this is seen as a pervasive threat impacting the majority of the marine protected areas, and many of the other threats identified are the result of limited enforcement capabilities.

Half Moon Caye Natural Monument was one of two protected areas to identify boat grounding as a key threat, reflecting its fragility in being located on an isolated atoll, its proximity to the international shipping lane and boat-grounding impacts experienced already. The second marine protected area highlighting this threat is Hol Chan, which is impacted by occasional groundings of smaller vessels as they navigate the channel through the reef.

Research activities were identified as a key threat for one Marine Reserve, reflecting the possible need for comprehensive implementation of best practices policies for research – to ensure that concerns of negative impacts on biodiversity by research-related activities are addressed.

Combined pressures and threats impacting each marine protected area

An analysis of the identified pressures impacting each marine protected area to date, and the threat projections for the coming 5 years, provides a valuable insight into which of the marine protected areas face the highest level of threat (Figures 12 and 13) – though cautionary notes must be taken into consideration. For instance the threat assessment of Swallow Caye Wildlife Sanctuary focused entirely on the focal species of the Sanctuary (the West Indian manatee), and does not necessarily reflect the overall level of threat to the Sanctuary's biodiversity as a whole. Swallow Caye Wildlife Sanctuary has therefore been removed from the comparative assessment. Technical moderation of scores has been necessary in a few instances, primarily in cases where the severity of impact of local fishing activities is considered to have been underscored (Corozal Bay and Gales Point Wildlife Sanctuaries), and where broader experience and community based knowledge has been available from other stakeholders.

Glovers Reef Marine Reserve is at the lowest end of the spectrum in terms of pressures impacting it, (with a pressure score of 7.5 and threat score of 7.0), whilst Half Moon Caye Natural Monument has the highest score of all (with a pressure score of 34 and threat score of 39.3) (Figure 13).



Figure 12: Total Pressure and Threat scores per MPA



Figure 13: Total Combined Pressure and Threat scores per MPA

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Impact of each threat across the system

The impact of each pressure and threat across the protected areas where they have been identified has been ranked against the others, using the mean scores (scores range from 2.0 to 38.0) (Figure 14). The highest impacting past pressure is considered to be climate change, with a score of 27.8, even though this was only identified in four protected areas within the system. This was followed by boat groundings and the associated contamination of water by oil spills, with a score of 27.0.

Future threats have been assessed in the same way, the highest potential threat being identified as boat groundings and the associated contamination of water by oil spills, with a score of 38.0. 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 has also contributed to increasing this threat. The second highest threat is identified as mangrove clearance, with a score of 30.0, reflecting the mangrove clearance associated with the increasing interest in coastal and caye properties for tourism and retirement developments.

Threat Trends

In the majority of cases, the pressures currently impacting the mpas are assessed as being likely to remain the same, or increase, over the next 5-year period, with the most significant changes being anticipated increases in impacts from boat groundings / oil spills with increasing boat activity and movement of crude oil, and from clearance of mangrove for coastal and caye development (Figure 14).



Figure 14: Mean score of each pressure and threat across the MPAs



Wildtracks, 2009 70

4. Results: Management Effectiveness

The data was analyzed at both site and national level, to form an overview of management effectiveness of the National Protected Areas System in Belize, identifying the areas of relative strengths and weaknesses of the protected areas system as a whole. The results also highlight site-level strengths and weaknesses, providing protected area managers and co-management agencies with recommendations for strengthening management.

4.1 Areas of Strength

Six indicators score as VERY GOOD (>300 to 4.00) - the strengths of the protected areas in Belize lie in the strong legislative framework under which the protected areas are established, and on the donordriven focus over the last five improving the years on administrative framework organizational structure and capacity of management / comanagement organization, financial management and operating procedures.

The strongest indicator (2.1: Legal Status) is linked to the

Indicator	Score	%
2.1 Legal: Legal Status	3.80*	95.0
5.3 Administrative Autonomy	3.22*	81.0
2.2 Legal: Boundary Survey and Demarcation	3.03	76.0
7.3 Financial Management	3.02*	75.0
5.1 Protected Areas Objectives	3.00	75.0
5.5 Operating Procedures: Board of Directors	3.00	75.0
*However:		

2.1 Legal: Legal Status: The Indicator does not reflect the ease of de-reservation.

5.3 Administrative Autonomy: This high level of autonomy may present challenges, with greater oversight and coordination needed.

7.3 Financial Management: The indicators reflect presence of processes, not actual management outputs – which validation shows to be considerably lower.

Table 27: Areas of Strength

strong legislative context within which the national protected areas are defined and regulated. Apart from the ministerial right to de-reserve part or all of a protected area, all national protected areas are clearly described by statutory instrument, and mapped as per their status (Marine Reserve, National Park, Wildlife Sanctuary, Forest Reserve etc.), resulting in 92% of protected area managers scoring Indicator 2.1 (Legal Status) as 4. When created, all national protected areas took into account existing land claims and tenures, and were clearly defined by Statutory Instrument, resulting in clear legal status. The 8% of protected areas scoring this indicator below 4.00 are all private, and whilst being officially accepted as part of the national parks system, have no legal basis for this status, as private protected areas are not yet

recognized under the national protected areas legislation. A current initiative under BAPPA (Belize Association of Private Protected Areas) seeks to address this through amendments to the legislation.

Indicators 5.3: Administrative Autonomy and 5.5: Operating Procedures: Board of Directors are both linked to the co-management system that is favoured by Forest Department, and now being incorporated into the Fisheries Department management profile. The majority of protected areas are managed through co-management partnerships, either for conservation or natural resource management purposes. Co-management partners range from large non-governmental organizations such as Belize Audubon Society (BAS) and the Toledo Institute for Development and the Environment (TIDE), to community-based organizations with limited infrastructure, human and financial resources, and commercial logging concession holders - but whatever the scale, the majority of these NGOs and CBOs have well defined organizational and governing structures, with a functional Board of Directors, and experience a fair degree of administrative autonomy. They are generally guided by a clear set of objectives, which are increasingly backed by the strong foundation of a management plan to provide the framework for effective management. Management capacity in these co-management organizations has been strengthened over the last few years by the identification of the need for strategic planning, capacity building and financial management skills by lead funding organizations.

4.2 Areas Requiring Strengthening

The assessment identified twelve areas of weakness, scoring an average of 2.00 or below across the protected areas system (Table 28). One indicator (3.12 Benefits: Sustainable Use for Economic Benefit) stands out as the area in most need of strengthening, scoring an average of only 1.38 (34.0%). This, as one of the central themes of the National Protected Areas System Plan, highlights a major weakness within the system demonstrating the limited

Indicator	Score	%
3.12 Benefits: Sustainable Use for Economic Benefits	1.38	34.0
3.6 Participation: Local Actors Leading Management	1.52	38.0
5.4 Advisory Committee	1.74	44.0
6.6 Human Resource Assessment	1.79	45.0
4.6 Research Programme	1.84	46.0
1.9 Traditional Knowledge	1.90	48.0
1.12 Scientific Research Activities	1.93	48.0
1.3 Inventory of Archaeological Resources	1.98	49.5
3.9 Existence of Capacity Building Strategy	1.98	49.5
1.6 Inventory: Tenures and Claims	2.00	50.0
2.4 Tenure Claim Conflict Resolution	2.00	50.0
4.2 Operational Plan	2.00	50.0

Table 28: Areas Requiring Strengthening

number of strategies to ensure social and economic benefits to local communities and stakeholders. Whilst many of the co-management agencies are relatively strong in encouraging participation of local stakeholders, there would appear to be a lack of focus in the formation of
socio-economic benefit strategies, an area that would benefit from strengthening through professional input. The second and third lowest scored indicators – **Indicator 3.6: Participation: Local Actors Leading Management** and **Indicator 5.4: Advisory Committee** also highlight a significant weakness. Whilst the NPAPSP seeks to increase participation of local stakeholders – particularly communities – within the decision making process of management, there is the need for significant capacity building in stakeholder communities before there will be the skills for effective leadership. However, the presence of Advisory Committees does greatly increase the level of participation, support and understanding within communities for protected areas, and is a mechanism that should be encouraged.

The development and implementation of operational plans is also highlighted as an area of weakness, being within the twelve lowest scored indicators (**Indicator 4.2: Operational Plan**) with a score of 2.00) identifying one of the largest gaps within the system - less than 33% of protected areas scored above 2 for operational plans, critical for the day-to-day management effectiveness of a protected area. The majority of protected area management activities are project-driven, with management organizations focusing on project implementation rather than developing a more effective operational framework, resulting in loss of focus on some of the administrative and operational activities often excluded from projects.

Science and research are both considered low priorities within the management framework of the majority of protected area management organizations, ranking within the lowest twelve indicators, as is management of human resources and capacity building. Both these are considered as in significant need of strengthening.

Ten protected areas rate as **VERY GOOD**, scoring above 3.00 out of 4.00 (Figure 16; Figure 17; Table 29). When analyzed in terms of management regime, one (the highest scoring), the majority within this top band of management effectiveness indicators are managed under comanagement partnerships one recurring feature within the preliminary analysis of the seven indicator sections is the relationship between co-management and increased management effectiveness. A review of the average score of each protected area over the system (Figures 15 and 16) demonstrates that co-management increases the probability of increased management effectiveness, with co-management partners having an increased ability to access funding for management.



Indicator (see overleaf)

Figure 15: Mean score by indicator across the National Protected Areas System - by Indicator

4. Resource Information	6. Community Participation and Benefits	6. Governance
1.1 Physical Environment	3.1 Communication Activities	5.1 Protected area objectives
1.2 Biotic Environment	3.2 Stakeholder Engagement	5.2 Co-management agreements
1.3 Cultural and Archaeological Resources	3.3 Educational Activities	5.3 Administrative autonomy
1.4 Social, Cultural, and Economic Context	3.4 Dissemination of Knowledge and Information	5.4 Advisory Committee
1.5 Resource Use and Occupancy	3.5 Level of Stakeholder Participation in	5.5 Board of Directors
1.6 Tenures and Claims	Management	5.6 Inter-organizational mechanisms
1.7 Conservation Target	Benefits	
1.8 Systematic Threat Assessment	3.13 Employment in activities related to the	6. Human Resources
1.10Traditional Knowledge	protected area	
1.10 Information Management Systems	3.14 Local Recognition of Protected Area Benefits	6.1 Qualified Site Manager
1.11 Environmental Monitoring Activities	3.6 Local Actors Leading Management	6.2 Site Manager Availability
4.12 Functional Scientific Research Activities	3.7 Volunteer Activities	6.3 Administrative Staff Availability
	3.8 Strength of Social Capital	6.4 Technical, Scientific, and Professional Staff
5. Resource Management	3.9 Capacity Building Strategies	Availability
	3.10 Socio-Economic Benefits Strategy	6.5 Operations Staff Availability
2.1 Legal: Legal Status	3.11 Extent of Local Economic Benefits	6.6 Human Resource Assessment
2.2 Legal: Boundary Survey and Demarcation	3.12 Sustainable Use for Economic	6.7 Training and Development
2.3 Legal: Permit, and Approval Processes		6.9 Staff Satisfaction
2.4 Tenure Claim Conflict Resolution	4. Management Planning	
2.5 Guidelines and Best Management Practices		7. Financial and Capital Management
2.6 Natural Resource Management	4.1 Management Plan Implementation	
2.7 Protection: Surveillance Activities	4.2 Operational Plan Implementation	7.1 Funding Adequacy
2.8 Protection: Enforcement Activities	4.3 Regulation and Zoning Implementation	7.2 Revenue Generation
2.9 Visitor and Tourism Management Activities	4.4 Guidelines and Best Management Practices	7.3 Financial Management
2.11 Visitor and Tourism Monitoring Activities	4.5 Long Term Management Needs Identification	7.4 Infrastructure Adequacy
	4.6 Program Monitoring and Evaluation	7.5 Equipment Adequacy
		7.6 Internal Access Adequacy
		7.7 Signage Adequacy
		7.8 Maintenance Adequacy



Indicator

Figure 16: Mean score by indicator across the National Protected Areas System – by Score

Rating	Score
Very Good	>3.00
Moderate	>2.00 - 3.00
Fair	>1.00 - 2.00
Critical	≤ 1.00

Table 29: Protected areas with overall management effectiveness scores >3						
Protected Area	Average Score	Management Status				
Hol Chan Marine Reserve	3.71	Belize Fisheries Department				
Sarstoon Temash National Park	3.48	Co-managed (NGO) / FD				
Half Moon Caye Natural Monument	3.36	Co-managed (NGO) / FD				
Blue Hole Natural Monument	3.34	Co-managed (NGO) / FD				
Rio Bravo Conservation and Management Area	3.18	Private Protected Area				
Cockscomb Basin Wildlife Sanctuary	3.13	Co-managed (NGO) / FD				
Victoria Peak Natural Monument	3.13	Co-managed (NGO) / FD				
Golden Stream Corridor Preserve	3.11	Private Protected Area				
Payne's Creek National Park	3.10	Co-managed (NGO) / FD				
Port Honduras Marine Reserve	3.03	Co-managed (NGO) / BFD				

The highest rated protected area in terms of management effectiveness is Hol Chan Marine Reserve, which is managed directly by the Belize Fisheries Department (Figure 17). This, along with Blue Hole and Half Moon Caye Natural Monuments, are the only protected areas within the system that can claim to be financially sustainable from visitation. When analyzed with relation to overall average management effectiveness scores, the majority of those protected areas with higher management effectiveness scores are under co-management agreements.



Figure 17: Mean score by Protected Area across the Indicators

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Of the seventeen protected areas that fall to the bottom of the list, with average scores below 2, all but one are administered by the Forest Department – seven under direct management, and seven under co-management agreements with community based organizations. Of the three, two are managed under long term forest licenses, and one is a private protected area (Table 30).

Table 30: Protected areas in greatest need of strengthening (with overall management effectiveness <2)						
Protected Area	Average Score	Management Status				
Aguas Turbias National Park	1.00	Forest Department				
Monkey Bay National Park	1.24	Guardians of the Jewel / FD				
Honey Camp National Park	1.28	Forest Department				
Burdon Canal Nature Reserve	1.32	Forest Department				
Five Blues Lake National Park	1.48	Friends of Five Blues Lake National Park / FD				
Freshwater Creek Forest Reserve	1.55	Forest Department				
Bacalar Chico National Park	1.61	Green Reef / FD				
Machaca Forest Reserve	1.72	Forest Department				
Mayflower Bocawina National Park	1.76	Friends of Mayflower Bocawina / FD				
Vaca Forest Reserve	1.77	Forest Department				
Spanish Creek Wildlife Sanctuary	1.83	Rancho Dolores Development Group / FD				
Sittee River Forest Reserve	1.85	New River Enterprises / FD				
Sibun Forest Reserve	1.85	Madera Development Group / FD				
Gales Point Wildlife Sanctuary	1.91	Gales Point Wildlife Sanctuary Community				
		Management Committee / FD				
Columbia River Forest Reserve	1.95	Forest Department				
Swallow Caye Wildlife Sanctuary	1.95	Friends of Swallow Caye / FD				
Runaway Creek Nature Preserve	1.97	Private (Birds Without Borders)				

4.3 Results per Protected Area Category

Protected area management categories range from MODERATE to VERY GOOD for National Indicators (Table 31, Figure 18). Natural Monuments, Marine Reserves and Private Reserves have the highest scores, all scoring above 2.50. Only one category Natural _ Monument achieves -VERY GOOD. One category

Table 31: Assessment per Management Category							
Management Category		Average Score 2009		Average % 2009			
Forest Reser	ve		2	.14		53.5	
Marine Rese	rve		2	.90		72.5	
National park		2.25		56.2			
Natural Monument		3.03		75.7			
Nature Reserve		2.24			56.0		
Private Rese	rve		2.55		63.7		
Wildlife Sanctuary		2.32		57.9			
Overall Average		2.41			60.3		
Poor:	Fair:	Mod	erate:	Very Goo	d:	Poor:	
0 – 25%	>25% - 50%	> 50	% - 75%	> 75%		0 – 25%	

- Forest Reserves requires the greatest strengthening, rating at the lower end of **MODERATE**, with a score of 2.14 (53.5%).



Figure 18.: Management Planning. Relative scores per management category

4.4 Results per Management Regime

When assessed per management regime, scores range from 1.74 (FAIR) to 3.02 (VERY GOOD). Only one of the management regimes rates as VERY GOOD, direct management by Fisheries Department, reflecting the direct investment in staff and operations by Government, and the strengthening of the marine system under the MBRS project, which sought to ensure that all marine protected areas improved their management effectiveness through management planning. This also reflects the strengths of the Fisheries Department as a management authority, with operational staff stationed at all Marine Reserves, and budget availability for surveillance and enforcement activities. Two management regimes rate as FAIR in this category - direct management by Forest Department, and management in partnership between Forest Department and community-based organizations (Table 32; Figure 19).

Table 32: Assessment per Management Regime						
Management Regime			Average Score 2009		Average % 2009	
Direct Management by I	Forest Department		1.7	' 4	43.4	
Forest Department /Co-	management: NGOs		2.9	91	72.8	
Forest Department /Co-	management: CBOs		1.99		49.8	
Forest Department /Co-	management: LCs		2.37		59.1	
Direct Management by Belize Fisheries Department			3.0)2	75.4	
Belize Fisheries Departr	ment /Co-manageme	nt: NGOs	2.79		69.7	
Belize Fisheries Department /Co-management: CBOs			2.78		69.6	
Overall Average			2.5	51	62.8%	
Poor: 0 - 25% Fair: >25% - 50% Moderate: > 50%			75%	Very G	ood: > 75%	



Figure 19: Relative scores per management regime

4.5 Analysis by Indicator Category

The indicators used in this assessment have been selected from the national **Monitoring Package for Assessing Management Effectiveness**. Throughout the assessment, a score of 1 to 4 is allocated to each indicator, and then expressed as a percentage to facilitate comparison with other regional assessments (Table 31). Seven indicator categories have been defined under the assessment protocol (Table 32).

Rating	Range
Very Good	>75%
Moderate	>50 – 75%
Fair	>25 – 50%
Critical	≤ 25%

Table 31: Rating System for Indicators

Table 32: Indicator Categories						
Indicator Category			Average 200	e Score)9	Average % 2009	
1. Resource Information	l		2.3	0	57.6	
2. Resource Administrat	ion, Management and	Protection	2.7	3	68.4	
3. Participation, Education and Socio-Economic Benefit			2.14		53.6	
4. Management Planning			2.19		54.9	
5. Governance			2.7	6	69.0	
6. Human Resources			2.49		62.1	
7. Financial and Capital	Management		2.49		62.1	
Overall			2.4	4	61.1%	
Poor: 0 - 25% Fair: >25% - 50% Moderate: > 50%			6 - 75%	Very G	ood: > 75%	
Cautionary Notes:						

Governance: the assessment tool in its current form is not considered to adequately evaluate governance – whilst weak central governance poses one of the greatest threats to the National Protected Areas System, the indicators for governance are focused on site level governance, indicating far stronger governance at system level than is the reality.

Financial Management: the indicators reflect presence of processes, not actual management outputs – which validation shows to be considerably lower.

* Indicators and Indicator categories used are from Young et. al., 2005



Figure 20: Average scores per Indicator Category

The protected areas of Belize have an overall rating of **MODERATE** (a score of 2.44 (61.1%)) under the national management effectiveness framework (Young et. al. 2005), with Indicator Categories ranging from 53.6% to 69.0% (Table 32; Figure 20). No Indicator Category rates as **VERY GOOD** - all fall within the range of **MODERATE** (> 50 - 75%).

The strongest Indicator Category is identified as **Governance**, with a score of 69.0%, a reflection of the strong organizational framework of the majority of the management organizations. The weakest Indicator Category is identified as **Participation**, **Education and Socio-Economic Benefit**, with a score of 53.6%.

For each Indicator Category, results are assessed for the following:

- Per Indicator
- Per Protected Area
- Per Protected Area Category
 - Forest Reserve
 - National Park
 - Nature Reserve
 - National Monument
 - Wildlife Sanctuary
 - Marine Reserve
 - Private Reserve
- Per Management Regime
 - Direct Management by Forest Department
 - Co-management: NGO/Forest Department
 - Co-management: CBO / Forest Department
 - Co-management: Long term logging concession / Forest Department
 - Direct management by Belize Fisheries Department
 - Co-management: NGO/ Belize Fisheries Department
 - Co-management: CBO / Belize Fisheries Department
- Conclusions
- Recommendations

4.5.1. Indicator Section One: Resource Information

<u>Goals</u>

These indicators assess the extent to which:

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

Effective protected area management is reliant on knowing the area to be managed – the ecosystems, the biodiversity, the identification of species and systems of conservation concern, resource use (both legal and illegal), as well as other impacts on biodiversity of the area. This knowledge is derived from a variety of sources – rapid environmental assessments, monitoring, maps, traditional knowledge and scientific studies, all weaving a tapestry on which management can be based, and forming a baseline against which performance can be monitored and evaluated. This section assesses accessibility of baseline information needed to make informed management decisions.

For effective management, it is also necessary to manage this information, ensuring it is accessible, and incorporated into management planning and management decisions. With the constantly changing physical and biotic environments, and human impacts, information needs to be up-dated on an ongoing basis, with identification of information gaps and targeting scientific research activities to fill these gaps.

Overall, the protected areas system rates as **MODERATE** for Section One: Resource Information, with a mean score of 2.30 (57.6%)

(i) Results per indicator

For the protected areas system as a whole, the scores per indicator for Section One range from the weakest indicator (Indicator 1.9: Traditional Knowledge), with a score of 1.90 to the strongest (Indicator 1.7: Site Assessment: Conservation Targets), scoring 2.78. No indicators rate as VERY GOOD (scoring above 3) (Figure 21).

The highest scoring indicator (Indicator 1.7: Conservation Targets) indicates that the majority of protected area managers have identified their priority conservation targets and threats – critical for effective management.

Three of the indicators rate as FAIR, with scores below 2.00 (Indicator 1.9: Traditional Knowledge, Indicator 1.12: Scientific Research Activities and Indicator 1.3: Cultural and

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Archaeological Resources. The low rating for Indicator 1.3 reflects the limited focus on archaeological and cultural resources by protected area managers.

All other indicators rate as **MODERATE**, with scores of between 2 and 3, suggesting that basic resource information is available for management for the majority of the protected areas, though it also highlights a number of information gaps that aren't yet being addressed incorporation of traditional and scientific knowledge into management planning, information on tenures and claims and the social and economic context all score at the lower end of MODERATE.



- 1.3 Inventory: Cultural and Archaeological Resources 1.9 Traditional Knowledge
- 1.4 Inventory: Social, Cultural, and Economic Context 1.10 Information Management Systems
- **1.5** Inventory: Resource Use and Occupancy
- 1.6 Inventory: Tenures and Claims

- 1.11 Environmental Monitoring Activities
- 1.12 Functional Scientific Research Activities

Figure 21: Section One: Resource Information: Average scores per indicator

(ii) Scores per protected area

Average scores per protected area for this section range from 1.17 to 3.83 (Figure 22). The protected areas that score well in this section are generally those that have recently completed (or are completing) management plans under the NPAPSP management plan framework (Table 33). This requires completed inventories and conservation planning as an integral part of the management planning process.

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Table 33: Indicator Section One: Strengths and Weaknesses within the PA System						
Protected Areas >3 (>75.0%)	Management Regime	Average Score 2009	Average % 2009			
Sarstoon Temash National park	NGO/FD	3.83	95.8			
Rio Bravo C&MA (PR)	PPA	3.50	87.5			
Half Moon Caye Natural Monument	NGO/FD	3.45	86.4			
Blue Hole Natural Monument	NGO/FD	3.40	85.0			
Cockscomb Basin Wildlife Sanctuary	NGO/FD	3.33	83.3			
Victoria Peak Natural Monument	NGO/FD	3.33	83.3			
Hol Chan Marine Reserve	BFD	3.33	83.3			
Golden Stream Corridor Preserve	PPA	3.25	81.3			
Gra Gra Lagoon National Park	CBO/FD	3.09	77.3			
Glover's Reef Marine Reserve	BFD	3.09	77.3			
Protected Areas 1 – 1.5 (≤37.5%) ¹						
Machaca Forest Reserve	FD	1.17	29.2			
Monkey Bay National Park	CBO/FD	1.25	31.3			
Burdon Canal Nature Reserve	FD	1.27	31.8			
Honey Camp National Park	FD	1.33	33.3			
Swasey-Bladen Forest Reserve	LC/FD	1.42	35.4			
Bacalar Chico National Park	NGO/FD	1.45	36.4			
Five Blues Lake National Park	CBO/FD	1.50	37.5			
Mango Creek (1) Forest Reserve	LC/FD	1.50	37.5			
Mango Creek (1) Forest Reserve	LC/FD	1.50	37.5			
¹ The four protected areas scoring 1.00 have bee	n excluded from th	ne analysis by defa	ult			

(iii) Results by Category of Protected Area

All but one protected area categories rate as **MODERATE** in terms of Resource Information (Figure 23). Marine Reserves have the highest score – many of the Marine Reserves have up-to-



Figure 23: Indicator Section One – Resource Information Relative scores per category of protected area

date management plans and monitoring ongoing programmes, providing information for effective management. Several of the Marine Reserves have also been included in system level planning initiatives, with identification and rigorous assessment of conservation targets and threats. For the remaining protected area categories, the average scores are largely a reflection of the relative percentage of

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protected areas (within each category) that have up-to-date management plans. Thus, whilst Bladen Nature Reserve scores quite well in this area, Burdon Canal and Tapir Mountain Nature Reserve do not – resulting in low average score for this category. Forest Reserves fair marginally better, as there has been historical data collection on timber resources, topography, etc., which is generally updated under the long-term forest licenses.

(iv) Results by Management Regime

When assessed per management regime, the most effective protected area administrator in the area of baseline knowledge availability for management is considered to be the Belize Fisheries Department, particularly when managing in partnership with a Non-Governmental Organization. (Table 34; Figure 24). Direct management under the Forest Department rates as **FAIR**, being limited by the limited financial and human resources available to fulfill the role in managing the terrestrial natural resources. However, when partnered with an NGO, CBO or long term logging concessionaire (LC), the management effectiveness rating increases to **MODERATE**.

Table 34: Assessment per Management Regime							
Management Regime			Average Score 2009		Average % 2009		
Direct Management by I	Forest Department		1.7	' 5	43.8		
Co-management: NGOs	/ Forest Department		2.7	'3	68.3		
Co-management: CBOs	/ Forest Department		2.09		52.2		
Co-management: LCs / Forest Department			2.04		51.0		
Direct Management by Belize Fisheries Department			2.88		72.0		
Co-management: NGOs / Belize Fisheries Department			2.91		72.8		
Co-management: CBOs / Belize Fisheries Department			2.36		59.0		
Private Protected Areas			2.35		58.9		
Poor: 0 - 25% Fair: >25% - 50% Moderate: > 50%			- 75%	Very G	ood: > 75%		



Figure 24: Indicator Section One – Resource Information Relative scores per management regime

These variations associated with management regime are largely a reflection of the requirement for co-management bodies to develop management plans that, under the NPAPSP framework, need to be based on adequate biodiversity, cultural and socio-economic information – and their ability to source the funding to do so.

(iv) Conclusions

- Resource information, whilst strong for those protected areas with comprehensive ecological assessments and management plans, is very weak for those that do not.
- Traditional knowledge has played a very limited role in protected area management to date – but could be better used in areas of historical accounts of biodiversity viability and threats: most protected area managers do not have ready access to such information and are unaware of some drastic historical declines – e.g. population sizes for the marine turtles.
- Use of data for adaptive management is improving significantly, particularly in conservation planning.
- Managers of the marine protected areas have developed good capacity in the areas of applied research and monitoring for biodiversity conservation.
- More experienced NGO managers of terrestrial protected areas are now starting to identify conservation research and monitoring needs, but still need to develop more research partnerships for implementation.
- Most CBO management organizations have extremely limited capacity in research and monitoring – and require inter-organizational support in this field
- The Forest Department, whilst having excellent capacity in many areas of resource information – data collection, data analysis and management, applied research, etc., is understaffed to effectively fulfill its mandate, and requires investment in institutional strengthening.

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(vi) Recommendations:

With an overall score of 2.30 (57.6%), Resource Information indicators score at the lower end of **MODERATE**, with a need for significant strengthening in this area. As more protected area managers develop comprehensive management plans within the national framework, many of the current weaknesses in Resource Information will be strengthened substantially -the management planning process includes collation of existing data, and requiring new data collection if necessary, through rapid ecological assessments, socio-economic assessments, etc.

- Prioritize resource information collection and management within the context of the primary mandates of biodiversity conservation and watershed protection.
- Ensure protected area managers are fully informed on the socio-economic context within which they are operating
- Prioritize monitoring of natural and cultural resources to ensure that resource status and use information is fully current
- Ensure that structured processes are in place and utilized to fully integrate available resource information into adaptive management

4.5.2 Indicator Section Two: Resource Administration, Management and Protection

This section identifies strengths and weaknesses in the processes that exist to address and manage legal uses of the protected areas, outside influences, conflicts over rights and uses, and illegal and prohibited activities.

<u>Goals</u>

These indicators assess the extent to which:

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

The protected areas system rates as **MODERATE** for Section Two, with a mean score of 2.73 (68.4%) (Figure 25), Belize is considered to have a strong legal framework for the effective establishment and management of its protected areas system, and protected area legislation that provides a framework within which protected areas can operate effectively.



(i) Results by Indicator



Resource Management

Resource Management

Indicator scores in Section Two range from 2.00 to 3.80, with only one indicator scoring 2.00 rating as FAIR, with a score of 2.00. Two indicators score above 3: **Indicator 2.1 – Legal Status** - reflecting the strengths of the legislation, and **Indicator 2.2: Boundary Survey and Demarcation**. The weakest indicator **(Indicator 2.4: Conflict Claim Resolution**), rates as **FAIR**, with a score of 2.00, and highlights a weakness of the system of limited consultation between regulating Government authorities - Lands Department, Department of the Environment, Lands and Survey, and Geology and Petroleum Department, leading to allocation of lands and mining permits within the protected areas system. This is compounded by 'Ministerial decree', which can result in the arbitrary de-reservation of all or part of a protected area.

(ii) Results by Protected Area

Protected area scores range from 1.3 (FAIR) to 4.00 (VERY GOOD), reflecting the range of administration management capacity across the system (Table 35; Figure 26). The protected areas under the direct administration of the Belize Fisheries Department score well in this Indicator Section, with the human and administrative resources and policies to be able to effectively manage the protected areas and implement effective surveillance and enforcement activities. Processes such as permit approval for natural resource extraction, tourism and research activities are a standard procedure, handled within the relevant Government offices.

Table 35: Indicator Section Two: Strengths within the PA System					
Protected Areas >3 (>75.0%)	Managemen t Regime	Average Score 2009	Average % 2009		
Mountain Pine Ridge Forest Reserve	FD	4.00	100.0		
Thousand Foot Falls Natural Monument	FD	4.00	100.0		
Hol Chan Marine Reserve	BFD	3.89	97.2		
Rio Bravo Conservation and Management Area	PPA	3.80	95.0		
Blue Hole Natural Monument	NGO/FD	3.67	91. 7		
Half Moon Caye Natural Monument	NGO/FD	3.67	91. 7		
St. Herman's Blue Hole NP	NGO/FD	3.67	91. 7		
Bacalar Chico Marine Reserve	BFD	3.56	88.9		
Actun Tunichil Muknal Natural Monument	NGO/FD	3.40	85.0		
Cockscomb Basin Wildlife Sanctuary	NGO/FD	3.40	85.0		
Victoria Peak Natural Monument	NGO/FD	3.40	85.0		
Laughingbird Caye National Park	NGO/FD	3.33	83.3		
Sarstoon Temash National park	NGO/FD	3.30	82.5		
Caye Caulker Marine Reserve	CBO/BFD	3.22	80.6		
Guanacaste National Park	NGO/FD	3.22	80.6		
Payne's Creek National Park	NGO/FD	3.11	77.8		
Port Honduras Marine Reserve	NGO/BFD	3.11	7 7.8		
Golden Stream Corridor Preserve	PPA	3.10	77.5		

Resource

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Management



Figure 26: Indicator Section Two: Resource Administration, Management and Protection Average scores per protected area Wildtracks, 2009 93

Resource Management

Two Forest Reserves also score highly, with significant investment in human resources – Mountain Pine Ridge Forest Reserve, one of the most established extractive reserves in Belize, and Thousand Foot Falls Natural Monument. These are managed as a single unit. Whilst the Forest Department protected areas have strong administrative support, they do not benefit from the same input of human resources, relying far more on co-management partnerships for on-site management.

Eight protected areas rate as **FAIR**, with scores between 1.00 and 2.00, the lowest being of 1.30. Of these, three score 1.50 or below (Table 36). The protected areas most in need of strengthening are those co-managed by the smaller / younger CBOs partnered with Forest Department, which struggle to find enough funds to employ rangers and other staff for effective natural resource management. Some of these will develop into more effective NGOs, whilst others will continue to struggle, dependent on the capacity of the organization.

Table 36: Indicator Section Two: Weak Areas within the PA System						
Protected Areas 1 – 1.5 (≤37.5%) ¹	Manageme nt Regime	Average Score 2009	Average % 2009			
Monkey Bay National Park	CBO/FD	1.30	32.5			
Burdon Canal Nature Reserve	FD	1.50	37.5			
Gales Point Wildlife Sanctuary	CBO/FD	1.50	37.5			
¹ The four protected areas scoring 1.00 have been excluanalysis by default						

(iii) Results per Protected Area Category

All protected area management categories rate as **MODERATE** or **VERY GOOD** in terms of Resource Administration, Management and Protection, with Marine Reserves and Natural Monuments both scoring above three (**VERY GOOD**) (Figure 27). The marine sector, which includes two of the Natural Monuments, has a good network of staff responsible for surveillance and enforcement activities, under a structured enforcement programme run under Fisheries Department.





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Private Reserves all score relatively well, with a degree of autonomy that enhances their surveillance and enforcement activities. The weakest protected area categories are the National Parks and Nature Reserves.

(iv) Results by Management Regime

When assessed per management regime, all management regimes rate as **MODERATE** or **VERY GOOD**. The most effective protected area administrator in the area of natural resource administration and management is considered to be the Belize Fisheries Department, with a full complement of Fisheries Department staff employed at each protected area specifically for surveillance and enforcement activities and biodiversity management. (Figure 28; Table 37). Direct management by Forest Department rates more highly than management in partnership with CBO's, with CBOs limited by human and financial resources. It should be noted that comanagement by the Forest Department in partnership with Logging Concessionaires, whilst scoring relatively high, with 2.87, focuses on management of the timber resources, with little or no management or protection of other resources.

Table 37: Assessment per Management Regime					
Management Regime		Average Score 2009		Average % 2009	
Direct Management by Forest Department			2.30		57.6
Co-management: NGOs / Forest Department			3.20		79.9
Co-management: CBOs / Forest Department			2.21		55.3
Co-management: LCs / Forest Department			2.87		71.8
Direct Management by Belize Fisheries Department			3.29		82.2
Co-management: NGOs / Belize Fisheries Department			2.93		73.2
Co-management: CBOs / Belize Fisheries Department			3.22		80.6
Private Protected Areas			2.84		71.0
Poor: 0 – 25%	Fair: >25% - 50%	Moderate: > 50% - 75% Very Go		ood: > 75%	

Direct Management by Belize Fisheries Department Co-management: CBOs / Belize Fisheries Department Co-management: NGOs / Forest Department Co-management: LCs / Forest Department Private Protected Areas Direct Management by Forest Department Co-management: CBOs / Forest Department



Figure 28: Indicator Section Two – Resource Administration, Management and Protection 15 Relative scores per management regime

(v) Conclusions

- Weak governance processes significantly limit protected area management: contradictory and conflicting actions by different government departments weaken the system significantly. In recognition of this, current initiatives are underway to strengthen communication amongst relevant authorities, and to ensure that due process is followed in decision-making regarding the conservation of natural resources within the protected areas system.
- Managers of terrestrial protected areas have a tendency to over-rate the effectiveness of their surveillance and enforcement, and generally do not adequately scale these activities in proportion with the impacts on biodiversity. Significantly more support is required from the Forest Department, Belize Defense Force, Police Department and legal structure in this regard. Effective enforcement will upset those who disregard protected area policies, and that should be considered part of the responsibility of the mandate.

(vi) Recommendations:

With a mean score of 2.73 (68.4%), this indicator section scores relatively well, the weakest indicator score being that associated with tenure / claim conflict resolution – reflecting the weaknesses arising from limited inter-departmental communication and cooperation within the Government of Belize, an area in significant need of strengthening.

Protected areas managers generally rate the effectiveness of the enforcement activities at the upper end of **MODERATE** – however, the biodiversity indicators demonstrate that current enforcement levels are inadequate for maintenance of key indicator species. There is an urgent need for staff and authority recognition of current enforcement limitations, and significant strengthening of enforcement capacity and implementation.

- Support current initiatives to increase inter-departmental communication and collaboration within government, to ensure full compliance with legislation and policies relating to protected area administration and management
- Defining responsibility and provision of resources for strengthened surveillance and enforcement
- Prioritize investment and strengthening of the capacity of protected area managers and staff (Government and non-Government) to significantly strengthen enforcement, and prioritize implementation, particularly of terrestrial protected areas

4.5.3 Participation, Education and Socio-Economic Benefits

Indicators in this section highlight the level of involvement of local communities and stakeholders in the management of the protected areas, whether they are benefiting from the presence of the protected area, and whether there is recognition of the goods and services provided by the protected area. The protected areas system rates at the lower end of **MODERATE** for Indicator Section Three, with a mean score of 2.14 (53.6%).

<u>Goals</u>

These indicators assess the extent to which:

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

(i) Results by Indicator

Averaged scores per indicator for all protected areas in Section Three range from 1.38 (FAIR) to 2.46 (MODERATE) (Figure 29). Generally, the majority of protected areas do not perform very well in the areas of Participation, Education and Socio-economic Benefit. No indicators score 3 or above, with the majority of indicators scoring between 2 and 3 (MODERATE).



3.2 Stakeholder Engagement

3.3 Educational Activities

3.4 Dissemination of Knowledge and Information

3.5 Participation: Level of Stakeholder Participation in

Management

3.6 Participation: Local Actors Leading Management



3.9 Participation: Capacity Building Strategies 3.10 Benefits: Presence of Socio-Economic Benefits Strategy

3.11 Benefits: Extent of Local Economic Benefits

3.12 Benefits: Sustainable Use for Economic Benefits

3.13 Benefits: Employment in activities related to the protected area

3.14 Benefits: Local Recognition of Protected Area Benefits

Figure 29: Indicator Section Three – Participation, Education and Socio-Economic Benefit Relative scores per management regime

Participation Education Benefi

Three indicators score below 2 (FAIR) – Indicator 3.6: Local actors leading protected area management, Indicator 3.9: Capacity Building Strategies and Indicator 3.12: Sustainable use for economic benefit (Figure 29). The strongest indicator in this section is 3.4 Dissemination of Knowledge and Information, with a score of 2.46, indicating that even this needs to be strengthened within the system.

(ii) Results by Protected Area

The protected areas that have higher scores in this section are primarily key marine tourism destinations – Hol Chan Marine Reserve (including Shark Ray Alley) and the two marine protected areas of Lighthouse Reef – Blue Hole and Half Moon Caye Natural Monuments (Table 38; Figure 30). Only Hol Chan Marine Reserve scores above three, rating as **VERY GOOD**. The tourism stakeholders are very supportive of these sites, recognizing their value, with the tourism sector generally, and a number of tour operations in particular, being partially dependent economically on these protected areas. Sarstoon Temash National Park also rates highly – this protected area is the first to provide sustainable use access to local communities, with community members utilizing traditional non-timber forest products from the area. The subsistence nature of the communities is reflected in a high level of recognition of environmental services.

Table 38: Indicator Section Three: Strengths within the Protected Areas System					
Protected Areas >3 (>75.0%)	Management Regime	Average Score 2009	Average % 2009		
Hol Chan Marine Reserve	BFD	3.71	92.9		
Protected Areas 1 – 1.5 (≤ 37.5%) ¹					
Aguas Turbias National Park	FD	1.00	25.0		
Burdon Canal Nature Reserve	FD	1.00	25.0		
Freshwater Creek Forest Reserve	FD	1.14	28.6		
Machaca Forest Reserve	FD	1.14	28.6		
Sibun Forest Reserve	LC/FD	1.14	28.6		
Sittee River Forest Reserve	LC/FD	1.21	30.4		
Vaca Forest Reserve	FD	1.21	30.4		
Swallow Caye Wildlife Sanctuary	NGO/FD	1.23	30.8		
Manatee Forest Reserve	FD	1.29	32.1		
Mango Creek (1) Forest Reserve	LC/FD	1.29	32.1		
Mango Creek (4) Forest Reserve	LC/FD	1.29	32.1		
Maya Mountain Forest Reserve	LC/FD	1.29	32.1		
Honey Camp National Park	FD	1.31	32.7		
Five Blues Lake National Park	CBO/FD	1.36	33.9		
Monkey Bay National Park	CBO/BFD	1.36	33.9		
Runaway Creek Nature Preserve	PPA	1.36	33.9		
Swasey-Bladen Forest Reserve	LC/FD	1.36	33.9		
¹ The four protected areas scoring 1.00 have been excluded from the analysis by default					

Participation Education Benefit

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Figure 30: Indicator Section Three: Participation, Education and Socio-Economic Benefit Average scores per protected area

Participation Education Benefi

Those protected areas that do perform less well are primarily managed directly by Forest Department, or through long term timber concession partnerships. Whilst these provide economic benefit for Belize at the national level through taxes and royalties, the level of stakeholder employment is not considered significant when compared with that of the tourism sector, tending to be focused on a few individuals, with the majority of benefits going to the commercial logging company.

(iii) Results by Category of Protected Area

Protected area management categories range from **FAIR** to **MODERATE** for Section Three -Participation, Education and Socio-Economic Benefit (Figure 31). Whilst Marine Reserves and Natural Monuments have the highest scores, both scoring above 2.50, neither achieves a rating of **VERY GOOD**. Two categories, Nature Reserves and Forest Reserves, both score poorly in this area. Nature Reserves are designated for strict protection, which reduces the potential for socioeconomic benefit, being strictly non-extractive, and not open for tourism.

Forest Reserves, generally managed either directly through the Forest Department or through agreements with Logging Concession holders, have traditionally been managed for resource extraction by concession holders, and have not focused on mechanisms for stakeholder participation, nor for economic benefit of the local communities – unlike the Marine Reserves, which, as a policy, engage stakeholders through Advisory Committees (per protected area), and are managed towards the goal of supporting a sustainable fishery.



Figure 31: Indicator Section Three – Participation, Education and Socio-Economic Benefit Relative scores per category of protected area

(iv) Results per Management Regime

When assessed per management regime, five of the management regimes rate as **MODERATE**, whilst two rate as **FAIR**. The most effectively managed protected area regimes in the area of Participation, Education and Socio-Economic Benefit are those under direct management by the Belize Fisheries Department, the Marine Reserves being managed as sustainable use areas, with significant benefits to traditional fishermen and the tourism industry. (Table 39; Figure 32). Direct management by Forest Department and co-management partnerships between Forest Department and Logging Concession holders rate as **FAIR** – with the lowest scores, both being below 2.00.

Table 39: Assessment per Management Regime					
Management Regime		Average Score 2009		Average % 2009	
Direct Management by Forest Department			1.39		34.7
Co-management: NGOs / Forest Department			2.61		65.2
Co-management: CBOs / Forest Department			2.08		52.0
Co-management: LCs / Forest Department			1.64		41.1
Direct Management by Belize Fisheries Department			2.86		71.4
Co-management: NGOs / Belize Fisheries Department			2.70		67.5
Co-management: CBOs / Belize Fisheries Department		2.50		51.4	
Poor: 0 – 25%	Fair: >25% - 50%	Moderate: > 50% - 75% Very Go		ood: > 75%	



Figure 32: Section Three – Participation. Education and Socio-Economic Benefit Relative scores per management regime

Participation Education Benefi

Participation Education Benefit

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(v) Section Three Conclusions

- Several co-management NGOs, along with the management authorities, have had excellent educational / awareness programmes – but these have generally been limited to the duration of project funding. These have set good foundations of awareness, but these activities need the continuity of ongoing programmes.
- Public and political awareness of the importance of the protected area system, in contribution to the national economy, in watershed protection and water security, in natural disaster mitigation, climate buffering, etc., is inadequate - threatening the longterm security of Belize's social and financial investments in its protected areas.

(vi) Section Three Recommendations:

Public participation, education and access to socio-economic benefits are recognized within the National Protected Areas Policy and System Plan as important support mechanisms to engender greater awareness, appreciation and support for the protected areas. With a mean score of 2.14 (53.6%), this is one of the weaker areas of management, and is reflected by the broad lack of public and political understanding of the contributions of the protected areas to the economy, quality of life, and security against natural disasters. This transcribes to a disturbing unwillingness to adequately defend the protected areas and the natural and cultural resources they protect, along with the environmental services provided – for the benefit of the nation.

This weakness in support mechanisms therefore results in significant threats to the protected areas, demonstrating the need to strengthen management in these areas.

- Prioritize development and implementation of activities to strengthen education / dissemination of information, stakeholder engagement, access to socio-economic benefits (including employment),
- Prioritize recognition of benefits arising from the protected areas system
- Conduct an economic evaluation of the protected areas system, including watershed functionality and other environmental services, natural resource use, visitation and employment, so as to better inform leaders and the general public of the value and contribution of the protected areas to the nation.

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4.5.4. Management Planning

This section highlights strengths and weaknesses in the management planning processes - management plans, operational plans, site design plans, and regulations and zoning – as well as the processes of management, including monitoring. The protected areas system rates at the lower end of **MODERATE** for Section Four, with a mean score of 2.190 (54.9%).

<u>Goals</u>

These indicators assess the extent to which:

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

(i) Results by Indicator

Averaged scores per indicator for all protected areas in Section Four range from 1.84 (FAIR) to 2.54 (MODERATE). No indicators score 3 or above, with the majority of indicators scoring between 2 and 3 (MODERATE). Two indicators rate as FAIR, scoring 2 or below – the first, Indicator 4.6: Research Programme – reflects the focus of the protected areas system on surveillance and enforcement and visitor management, with research being considered a



4.5 Long Term Management Needs Identification 4.6 Program Monitoring and Evaluation

'luxury' when budgets are limited in the majority of protected areas. The second, Indicator 4.2: Operational Plan Implementation, demonstrates the need for greater integration of planning at annual level, with the implementation of operational plans that are based on management goals, not solely on protected area maintenance activities and visitor management (Figure

The system scores best on Indicator 4.3: Regulation and Zoning Implementation,

Management Planning

but less well on **Indicator 4.1: Management Planning** – only twenty seven (approximately 44%) of Belize's protected areas have up-to-date management plans, with eleven of these being considered fully sufficient for management purposes. Whilst this is a great improvement on the 2006 assessment, site and system-level management planning is still considered a major weakness within the system, considering the key role management plans play in providing a framework and guiding management activities in the short and medium term.

(ii) Results by Protected Area

Those protected areas that score above 3.00 in this section are those with comprehensive management plans that are used to guide operational planning, and provide clear rules and regulations for management of the protected area (Table 40; Figure 34).

Table 40: Indicator Section Three: Strengths and Weaknesses within the PA System				
Protected Areas > 3 (> 75.0%)	Management Regime	Average Score 2009	Average % 2009	
Sarstoon Temash National park	NGO/FD	3.67	91.6	
Glover's Reef Marine Reserve	BFD	3.50	87.5	
Hol Chan Marine Reserve	BFD	3.50	87.5	
Rio Bravo Conservation and Management Area	PPA	3.50	87.5	
Blue Hole Natural Monument	NGO/FD	3.33	83.3	
Half Moon Caye Natural Monument	NGO/FD	3.33	83.3	
Chiquibul Forest Reserve	LC/FD	3.33	83.3	
Bladen Nature Reserve	NGO/FD	3.33	83.3	
Golden Stream Corridor Preserve	PPA	3.33	83.3	
Payne's Creek National Park	NGO/FD	3.33	83.3	
Caye Caulker Marine Reserve	CBO/BFD	3.17	79.2	
Protected Areas 1 – 1.5 (≤ 37.5%) ¹				
Aguas Turbias National Park	FD	1.00	25.0	
Burdon Canal Nature Reserve	FD	1.00	25.0	
Honey Camp National Park	FD	1.33	33.3	
Mayflower Bocawina National Park	FD	1.00	25.0	
Monkey Bay National Park	CBO/FD	1.00	25.0	
Vaca Forest Reserve	FD	1.00	25.0	
Five Blues Lake National Park	CBO/FD	1.00	25.0	
Machaca Forest Reserve	FD	1.17	29.2	
Sibun Forest Reserve	LC/FD	1.17	29.2	
Sittee River Forest Reserve	LC/FD	1.17	29.2	
Billy Barquedier National Park	CBO/FD	1.17	29.2	
Columbia River Forest Reserve	FD	1.33	33.3	
Freshwater Creek Forest Reserve	FD	1.33	33.3	
Manatee Forest Reserve	LC/FD	1.33	33.3	
Maya Mountain Forest Reserve	LC/FD	1.33	33.3	
¹ The four protected areas scoring 1.00 have been excluded from the analysis by default				

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Two private protected areas also rate as **VERY GOOD** Two of the more established commercial long term logging concessions also score 3.00, rating at the top end of **MODERATE** for Management Planning, though these focus primarily on the commercial management of the timber resources and active logging compartments, as opposed to the overall biodiversity of the area.

Five protected areas rate as **POOR** within this section, requiring greater strengthening through management planning activities towards effectively guiding management.

(iii) Results per Protected Area Category

Protected area management categories range from **FAIR** to **MODERATE** for Section Four – Management Planning (Figure 35). Marine Reserves and Natural Monuments have the highest scores, both scoring above 2.50, though neither reaches **VERY GOOD**. One category – Forest Reserves scores poorly in this area, rating as **FAIR**, with a score of 1.76.



Figure 35: Section Four – Management Planning. Relative scores per management category

(iv) Results per Management Regime

When assessed per management regime, scores range from 1.32 (FAIR) to 3.17 (VERY GOOD). Two of the management regimes rate as VERY GOOD, both under Fisheries Department (both direct management, and with co-management partners), reflecting the strengthening of the

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marine system achieved under the MBRS project, which sought to ensure that all marine protected areas improved their management effectiveness through management planning. Two management regimes rate as **FAIR** in this category, with direct management by Forest Department, and management in partnership between Forest Department and community-based organizations (Table 41; Figure 36).

Table 41: Assessment per Management Regime					
Management Regime		Average Score 2009		Average % 2009	
Direct Management by Forest Department			1.32		32.9
Co-management: NGOs / Forest Department			2.82		70.6
Co-management: CBOs / Forest Department			1.70		42.5
Co-management: LCs / Forest Department			2.15		53.6
Direct Management by Belize Fisheries Department			3.08		77.1
Co-management: NGOs / Belize Fisheries Department			2.72		68.1
Co-management: CBOs / Belize Fisheries Department			3.17		79.2
Poor: 0 – 25%	Fair: >25% - 50%	Moderate: > 50% - 75% Very Good		ood: > 75%	



Figure 36: Section Four – Management Planning Relative scores per management regime

(v) Section Four Conclusions

 Significant progress has been made by several protected area managers in management plan development and implementation since the 2006 assessment, but many critical protected areas still lack both management and operational plans – and their on-site management (if any) is therefore ad-hoc, unplanned, unstructured and therefore less effective.

The need for ongoing monitoring of both programme implementation and success in achieving goals is increasingly recognized by the larger NGOs and authorities, as is its role in adaptive management – though programme monitoring and evaluation is currently very much in its infancy in implementation. Protected areas lacking management and/or operational plans generally have no structured monitoring process, and are therefore unable to assess their effectiveness in biodiversity conservation or programme implementation.

(vi) Recommendations:

In line with priorities identified under the Convention on Biological Diversity, all protected areas in Belize should have comprehensive management plans, cataloguing the biophysical environment, integrating conservation planning and the resulting conservation strategies to improve conservation of natural (and cultural) resources. Significant progress is being made in this direction, building on the objectives and framework developed in the National Protected Area Policy and System Plan – though many protected areas still lack updated management plans on which to base annual operational or workplans and management strategies. Developing the first comprehensive management plan for a protected area is a significant undertaking, with a substantial cost associated with it. NGOs and CBOs are better positioned to access grant funding for such investments than are the respective Government authorities, (though the Belize Fisheries Department has been successful in securing financial support for the development of management plans for marine protected areas under its management, though regional collaboration with the Mesoamerican Barrier Reef System project, and through its long term partnership with the Wildlife Conservation Society).

As with any conservation investment, the development of management plans should be prioritized for those protected areas prioritized within the system for their biodiversity and/or threats, and those with the best prospects of effective implementation. The development of structured conservation goals, strategies and actions provide the framework for management planning, and are critical steps towards improved management effectiveness, and towards effective monitoring and evaluation of management success for adaptive management.

Recommended actions therefore include:

- Prioritization of comprehensive management planning for key protected areas lacking updated plans
- Continue collaboration with donor agencies to secure funding for prioritized system level conservation plans
- Continue capacity building of management teams and co-management partners to effectively use management plans as a central resource and management tool
Management Planning

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- Continue integration of site level management planning with system level management frameworks towards greater conservation success
- Continue capacity building amongst protected area managers and authorities in monitoring both biodiversity and programme implementation.

Governance

4.5.5. Governance

The section looks at management effectiveness through the establishment of authority, responsibility, and accountability, with essential governance structures and supporting processes that are well designed and implemented. However, the assessment tool in its current form does not adequately evaluate governance – the consultation process highlighted that weak central governance poses one of the greatest threats to the National Protected Areas System, yet the indicators for governance overlook this level, focusing on site level governance, and give a misleading result, indicating far stronger governance at system level than is the reality.

<u>Goals</u>

These indicators assess the extent to which:

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

Overall, protected areas score an average of 2.76, rating as **MODERATE** for Indicator Section Five: Governance.

(i) Results by Indicator

Under Indicator Section 5, the protected areas system scores highly for **Indicator 5.1: Protected Area Objectives**; **Indicator 5.3: Administrative Autonomy**; and **Indicator 5.5: Board of Directors**, each of these rating as **MODERATE**, an indication of the strong organizational structures of the majority of the management and co-management organizations (Figure 37).



Figure 37: Section Five: Governance Average scores per indicator

Governance

The weakest indicator, and the only one to rate as **FAIR**, is **Indicator 5.4**: **Advisory Committee**. Whilst the presence of an active Advisory Committee greatly strengthens the management of a protected area, in providing effective mechanisms for reaching out and involving stakeholders, few terrestrial protected areas have successfully managed to maintain active committees. The marine protected areas however, have had significantly greater success in establishing, supporting and collaborating with advisory committees.

(ii) Results by Protected Area

Twenty four protected areas rate as **VERY GOOD**, scoring above 3.00 in this section, indicating the strong organizational frameworks that support Government Departments, NGOs, commercial enterprises and, to a lesser extent, CBOs, within Belize (Figure 38).

Indicator Section Five: Strengths and Weaknesses within the PA System				
Protected Areas >3 (>75.0%)	Management Regime	Average Score 2009	Average % 2009	
Blue Hole Natural Monument	NGO/FD	3.83	95.8	
Half Moon Caye Natural Monument	NGO/FD	3.83	95.8	
Chiquibul Forest Reserve	LC/FD	3.75	93.8	
Chiquibul National Park	NGO/FD	3.67	91.8	
Payne's Creek National Park	NGO/FD	3.67	91.8	
TIDE Private Protected Lands	PPA	3.60	90.0	
Golden Stream Corridor Preserve	PPA	3.50	87.5	
Hol Chan Marine Reserve	BFD	3.50	87.5	
Port Honduras Marine Reserve	NGO/BFD	3.50	87.5	
Caye Caulker Forest Reserve	CBO/FD	3.40	85.0	
Actun Tunichil Muknal Natural Monument	NGO/FD/IoA ²⁸	3.33	83.3	
Cockscomb Basin Wildlife Sanctuary	NGO/FD	3.33	83.3	
Victoria Peak Natural Monument	NGO/FD	3.33	83.3	
Columbia River Forest Reserve	FD	3.33	83.3	
Crooked Tree Wildlife Sanctuary	NGO/FD	3.33	83.3	
Gra Gra Lagoon National Park	CBO/FD	3.33	83.3	
Mango Creek (1) Forest Reserve	LC/FD	3.25	81.3	
Mango Creek (4) Forest Reserve	LC/FD	3.25	81.3	
Swasey-Bladen Forest Reserve	LC/FD	3.25	81.3	
Rio Bravo Conservation and Management Area	PPA	3.20	80.0	
Guanacaste National Park	NGO/FD	3.17	79.3	
Sarstoon Temash National park	NGO/FD	3.17	79.3	
St. Herman's Blue Hole NP	NGO/FD	3.17	79.3	
Tapir Mountain Nature Reserve	NGO/FD	3.17	79.3	
Protected Areas 1 – 1.5 (≤ 37.5%)				
Aguas Turbias National Park	FD	1.00	25.0	
Honey Camp	FD	1.00	25.0	
Monkey Bay National Park	CBO/FD	1.30	32.5	
¹ The four protected areas scoring 1.00 have been exclu	uded from the analy	sis by default		

²⁸ IoA: Institute of Archaeology











(iii) Results per Protected Area Category

Protected area management categories range from **MODERATE** to **VERY GOOD** for Section Five – Governance (Figure 39). Natural Monuments have the highest score, scoring 3.00 (**VERY GOOD**), followed by Natural Monuments (**MODERATE**), both managed primarily through comanagement partnerships between NGOs and Forest Department. No category scores below 2.00.



Management Category

Figure 39: Section Five – Governance Relative scores per management category

(iv) Results per Management Regime

When assessed per management regime, scores range from 1.32 (FAIR) to 3.17 (VERY GOOD) (Table 42; Figure 40). Two of the management regimes rate as VERY GOOD, both under Fisheries Department (both direct management, and with co-management partners), reflecting the strengthening of the marine system achieved under the MBRS project, which sought to ensure that all marine protected areas improved their management effectiveness through management planning. One management regime rates as FAIR in this category, with direct management by Forest Department. Co-management between CBOs and both the Forest Department and the Belize Fisheries Department score at the lower end of MODERATE, significantly weaker than the remaining management regimes.

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Table 42: Assessment per Management Regime					
Management Regime			Average 200	e Score)9	Average % 2009
Direct Management by Forest Department			1.8	9	47.1
Co-management: NGOs / Forest Department			3.3	1	82.8
Co-management: CBOs / Forest Department		2.30		57.6	
Co-management: LCs / Forest Department		3.0	0	75.0	
Direct Management by Belize Fisheries Department		3.00		75.0	
Co-management: NGOs / Belize Fisheries Department		3.06		76.4	
Co-management: CBOs / Belize Fisheries Department		2.2	.5	56.3	
Poor: 0 – 25%	Fair: >25% - 50%	Moderate: > 50% - 75% Very Go		ood: > 75%	



Figure 40: Section Five – Governance. Relative scores per management regime

(v) Section Five Conclusions

 Governance is generally good across the system in terms of objectives and organizational structure, though many protected areas lack functional advisory boards – which are recognized as being part of an effective mechanism to establish and maintain consensus in decision-making, transparency, and accountability.

(vi) Section Five Recommendations:

 Adopt and implement the National Co-management Framework and sign new comanagement agreements using the new template with a clear division of roles and responsibilities

Governance

- Strengthen the organizational capacity of CBO co-managers for management and project implementation
- Strengthen the Forest and Fisheries Departments ability to provide direction and capacity-building facilitation to weaker CBO co-managers
- Implement a two-year cut-off period for CBO co-managers to fulfill the criteria detailed within the Management Planning Guidelines (NPAPSP), and achieve and maintain adequate levels of governance or lose co-management rights
- Ensure that all national protected areas establish, facilitate and collaborate with advisory committees, with transparency in selection / election of advisory board members, and a clear Terms of Reference, and access to facilitation support
- Ensure that effective mechanisms are in place to integrate advisory committee outputs into management decision-making process
- Adopt and implement strengthened co-management agreement with clear division of responsibilities

Humai Resource

4.5.6. Human Resources

This section assesses management effectiveness in terms of human resources – the presence of sufficient, adequately educated and trained staff, with good morale to ensure high productivity. Overall, this section scores an average of 2.49 across the protected area system, with a rating of **MODERATE**.

<u>Goals</u>

These indicators assess the extent to which:

- Necessary staff members are recruited and available.
- Necessary staff are adequately educated and trained for their jobs.
- That mechanisms are in place to assess whether there is good staff satisfaction to ensure high productivity
- Volunteers are recruited and managed.



(vii) Results by Indicator

Figure 41: Section Six: Human Resources. Average scores per Indicator

Under Section 6, no indicator scores above 3.00, and one indicator rates as FAIR (Indicator 6.6 Human Resource Assessment), with a score of 1.79 (Figure 41). The highest scoring indicator is Indicator 6.1: Qualified Site Manager, suggesting that the majority of protected areas have site managers with the qualifications and experience to effectively manage the protected areas.

Generally, however, human resources are limited across the protected areas system, particularly in the area of technical input, with the second lowest indicator being the availability of Technical, Scientific, and Professional Staff. Most, if not all, protected area management and comanagement agencies (particularly those under Forest Department) are operating on bare bones staff and in some cases are severely understaffed, primarily as a result of financial limitations. Whilst Marine Reserves, managed under the Belize Fisheries Department, are generally staffed through Government funding, with an adequate administrative support structure, there is a need for Government to recognize the equal importance of terrestrial protected areas, and invest in core operational costs - particularly human resources - so as to build and retain capacity at all levels. **Indicator 6.8: Staff Satisfaction** rates as the third lowest indicator, at the lower end of **MODERATE**, with a score of 2.53, again as a result of limited finance, resulting in high staff turnover.

(viii) Results by Protected Area

Fourteen protected areas score above 3.00 in this section, including the majority of the private protected areas and commercial logging concession areas, suggesting that private or commercial entities are more focused on ensuring effective human resource management.

Indicator Section Six: Strengths and Weaknesses within the PA System				
Protected Areas > 3 (> 75.0%)	Management Regime	Average Score 2009	Average % 2009	
Hol Chan Marine Reserve	BFD	4.00	100.0	
Sarstoon Temash National park	NGO/FD	3.75	93.8	
Bladen Nature Reserve	PPA	3.50	87.5	
Golden Stream Corridor Preserve	PPA	3.50	87.5	
Deep River Forest Reserve	LC/FD	3.38	84.4	
Chiquibul National Park	NGO/FD	3.38	84.4	
Rio Bravo Conservation and Management Area	PPA	3.38	84.4	
Swasey-Bladen Forest Reserve	LC/BFD	3.25	81.3	
Manatee Forest Reserve	LC/FD	3.13	78.1	
Shipstern Nature Reserve	PPA	3.13	78.1	
Port Honduras Marine Reserve	NGO/BFD	3.13	78.1	
Payne's Creek National Park	NGO/FD	3.13	78.1	
Blue Hole Natural Monument	NGO/FD	3.13	78.1	
Half Moon Caye Natural Monument	NGO/FD	3.13	78.1	
Protected Areas 1 – 1.5 (≤37.5%)				
Monkey Bay National Park	CBO/FD	1.00	25.0	
Honey Camp National Park	FD	1.00	25.0	
Burdon Canal Nature Reserve	FD	1.00	25.0	
Five Blues Lake National Park	CBO/FD	1.00	25.0	
Freshwater Creek Forest Reserve	FD	1.00	25.0	
Bacalar Chico National Park	NGO/FD	1.00	25.0	
Caye Caulker Forest Reserve	CBO/FD	1.00	25.0	



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One protected area – **Hol Chan Marine Reserve** – scores 4.00 for all indicators, including Staff Satisfaction. This protected area is managed under the Belize Fisheries Department and is considered to have the financial and human resource for effective management. Its proximity to San Pedro also relieves some of the problems associated with many of the other marine protected areas, of staff being based in remote locations far from their families. This avoids the additional challenges of long commutes and isolation that contributes towards high staff turnover.

(ix) Results per Protected Area Category

Protected area management categories all fall within the rating of **MODERATE / VERY GOOD** for Section Six – Human Resources, ranging from 2.15 to 3.00 (Figure 43). Nature Reserves have the highest scores, with 3.00 (**VERY GOOD**), followed by Natural Monuments (**MODERATE**), both managed primarily through co-management partnerships between NGOs and Forest Department. Marine Reserves, with investment in staff from Government, also rates highly, with a score of 2.72. No category scores below 2.00.



Figure 43: Section Six – Human Resources. Relative scores per management category

(x) Results per Management Regime

When assessed per management regime, scores range from 1.72 (FAIR) to 3.06 (VERY GOOD) (Table 43: Figure 44). Only one of the management regimes rates as VERY GOOD – direct

Humar Resources

management by the Belize Fisheries Department, which ensures that each of its marine protected areas are fully staffed for basic surveillance, enforcement and biodiversity monitoring activities. The management regimes most in need of strengthening are those of protected areas managed under Forest Department, either directly or through co-management agreements with CBOs. The Forest Department does not support site-specific staff under co-management agreements, and the CBOs often do not have the capacity for locating funding to hire staff, often operating with volunteer staff – with only limited sustained success.

Table 43: Assessment per Management Regime						
Management Regime				e Score)9	Average % 2009	
Direct Management by Forest Department			1.9	2	47.9	
Co-management: NGOs / Forest Department			2.9)7	74.2	
Co-management: CBOs / Forest Department			1.72		42.9	
Co-management: LCs / Forest Department		2.9)4	74.2		
Direct Management by Belize Fisheries Department		3.06		76.6		
Co-management: NGOs / Belize Fisheries Department		2.21		55.2		
Co-management: CBOs / Belize Fisheries Department			2.88 71.8		71.8	
Poor: 0 – 25%	Fair: >25% - 50%	50% Moderate: > 50% - 75% Very Good:		ood: > 75%		



Figure 44: Section Six – Human Resources Relative scores per management regime

Human Resources

(xi) Section Six Conclusions

- Human resource capacity in protected area management organizations has increased significantly over the last decade, but many protected areas still lack adequate operational, technical and administrative staff.
- Marine Reserves benefit from investment from Government in essential on-site staff and an adequate administrative support structure. Other national protected areas, however, are, in some cases, severely understaffed, primarily as a result of financial limitations.
- There is a need for Government to recognize the equal importance of terrestrial protected areas, and invest in core operational costs - particularly human resources - so as to build and retain capacity at all levels.
- Human resource management in Government, NGO and CBO agencies is often weak, limited by financial resources, and does not facilitate expression and use of staff capacity to maximum effect – limiting staff satisfaction and career development, and resulting in high turnover.
- In some protected areas, the operational and lower management staff consider that they are often under-valued, and human resource management, including implementation of staff retention policies and incentives (both financial and nonfinancial) are generally in need of strengthening, with the goal of significantly reducing staff turnover.

(xii) Section Six Recommendations:

Good human resources need to be valued by both government and non-governmental bodies, often at all levels of organization from junior field staff to senior managers, and experience valued comparably with academic qualifications. The benefits of building awareness, motivation, capacity and organizational fidelity at all levels of staffing is often not reflected in organizational management, leading to high staff turnover and loss of skilled staff.

- Seek to ensure greater human resource funding for NGO / CBO management organizations, to provide stability and long term commitment for staff retention, with Government investment in core site-level staffing of identified critical terrestrial protected areas, through the co-management agencies
- Investment in human resource management training across the protected areas system

- Identify and implement non-financial mechanisms for increasing staff satisfaction and recognition, to reduce staff turn over
- Ensure that human resource investments are distributed where most needed within each management body through effective human resource assessment, building and retaining capacity at all levels – but with emphasis on identified gaps
- Within the limitations of funding availability, work towards structuring staff management, employment policies and implementation to enable employees to become career staff rather than transient employees

4.5.7 Financial and Capital Management

For effective management, adequate funds must be available, and necessary protected area infrastructure, equipment, signs and other assets in place and properly managed and maintained. The assessment tool, in its current form, assesses processes rather than outputs. The consultation process has clearly demonstrated that many agencies having good financial management processes in place fail to implement them or have other significant financial management shortcomings. The adequacy and management of finance is significantly lower than suggested by the current indicators.

<u>Goals</u>

These indicators assess the extent to which:

- Adequate funds are raised and available.
- Infrastructure, equipment, signs, and other assets are adequate for management of the protected area.
- Protected area infrastructure, equipment, signs, and other assets are properly managed and maintained.

Overall, the protected areas system scores **2.49** for Financial and Capital Management, rating as **MODERATE**.



(i) Results by Indicator

Figure 45: Section Seven: Financial and Capital Management - Average scores per Indicator

Financia Managemen

Financial Management

Under Section 7, no indicator scores below 2.00, and one indicator rates as **VERY GOOD** (Indicator 7.3 Financial Management), with a score of 3.02, reflecting the structured financial management systems that the majority of the management organizations have in place (Figure 45). Indicator 7.7: Signage rates as the lowest indicator, at the lower end of MODERATE, with a score of 2.05. All other indicators rate as MODERATE.

(ii) Results by Protected Area

Twenty three protected areas score 3.00 or above in this section, primarily those protected areas co-managed under NGO partnerships. Ten protected areas are highlighted as in greatest need of strengthening in the area of Financial and Capital Management (those that score below 1.50). These are generally non-extractive reserves managed directly by Forest Department or in partnership with community based organizations.

Indicator Section Seven: Strengths within the PA System				
Protected Areas >3 (75.0%)	Management Regime	Average Score 2009	Average % 2009	
Hol Chan Marine Reserve	BFD	3.88	96.9	
Sarstoon Temash National Park	NGO/FD	3.88	96.9	
Mountain Pine Ridge Forest Reserve	LC/FD	3.63	90.6	
Thousand Foot Falls Natural Monument	FD	3.50	87.5	
Blue Hole Natural Monument	NGO/FD	3.38	84.4	
Half Moon Caye Natural Monument	NGO/FD	3.38	84.4	
Chiquibul Forest Reserve	LC/FD	3.38	84.4	
Rio Bravo Conservation and Management Area	NGO/FD	3.38	84.4	
Caye Caulker Marine Reserve	CBO/BFD	3.25	81.3	
Gladden Spit and Silk Cayes Marine Reserve	NGO/BFD	3.25	81.3	
Guanacaste National Park	NGO/FD	3.25	81.3	
Laughing Bird Caye National Park	NGO/FD	3.25	81.3	
Monkey Bay Wildlife Sanctuary	PPA	3.25	81.3	
Cockscomb Basin Wildlife Sanctuary	NGO/FD	3.13	78.1	
Victoria Peak Natural Monument	NGO/FD	3.13	78.1	
Crooked Tree Wildlife Sanctuary	NGO/FD	3.13	78.1	
Payne's Creek National Park	NGO/FD	3.13	78.1	
Port Honduras Marine Reserve	NGO/BFD	3.13	78.1	
St. Herman's Blue Hole National Park	NGO/FD	3.13	78.1	

One protected area – **Hol Chan Marine Reserve** – scores 4.00. This protected area is managed under the Fisheries Department and is considered to have the financial and human resource for effective management; it being one of the most visited protected areas in the country, and collects the associated entrance fees. A number of other protected areas also rank highly,

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including those such as Mountain Pine Ridge Forest Reserve, which are managed under a long term license agreement with a commercial logging company (and the main focus for Forest Department's direct investment in management resources); and those managed in partnership with large NGOs.

Indicator Section Seven: Areas needing strengthening within the PA System				
Protected Areas 1 - 1.5 (≤ 37.5%)	Average Score 2009	Average % 2009		
Bacalar Chico National Park	NGO/FD	1.00	25.0	
Monkey Bay National Park	CBO/FD	1.00	25.0	
Columbia River Forest Reserve	FD	1.13	28.1	
Billy Barquedier National Park	CBO/FD	1.25	31.3	
Honey Camp National Park	FD	1.25	31.3	
Spanish Creek Wildlife Sanctuary	CBO/FD	1.25	31.3	
Vaca Forest Reserve	FD	1.25	31.3	
Burdon Canal Nature Reserve	FD	1.38	34.4	
Five Blues Lake National Park	CBO/FD	1.38	34.4	
¹ The four protected areas scoring 1.00 have been exclu	uded from the analy	ysis by default		

The protected areas most in need of significant strengthening in this area are generally those managed directly by Forest Department, or in partnership with small community based organizations.

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Figure 46:

Section Seven: Financial and Capital Management - Average Score per Protected Area

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(iii) Results by Protected Area Category

Protected area management categories all fall within the rating of **MODERATE / VERY GOOD** for Section Seven – Financial and Capital Management, ranging from 2.05 to 3.18. Natural Monuments have the highest score, followed by Marine Reserves, both rating as **VERY GOOD** (Figure 47). These categories include the three protected areas that attract sufficient tourism to be financially sustainable – Blue Hole and Half Moon Caye Natural Monuments and Hol Chan Marine Reserve. Wildlife Sanctuaries, which are predominantly managed by CBO partnerships with Forest Department, require the greatest strengthening in this area, being limited by capacity for raising funds towards management.



Figure 47: Section Seven – Financial and Capital Management

Relative scores per management category

(iv) Results by Management Regime

When assessed per management regime, scores range from 1.69 (FAIR) for protected areas managed directly by Forest Department to 3.25 (VERY GOOD) for protected areas managed by Belize Fisheries Department in partnership with CBOs (Caye Caulker Marine Reserve is the only protected area in this category). Protected areas managed through co-management agreements between Forest Department and community based organizations are also highlighted as requiring greater strengthening (Figure 48).

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Assessment per Management Regime					
Management Regime				Score	Average % 2009
Direct Management by Forest Department			1.6	9	42.3
Co-management: NGOs / Forest Department			3.0	8	76.9
Co-management: CBOs / Forest Department		1.7	3	43.3	
Co-management: LCs / Forest Department		2.7	6	69.1	
Direct Management by Belize Fisheries Department		3.0	6	76.9	
Co-management: NGOs / Belize Fisheries Department		rtment	3.0	4	76.0
Co-management: CBOs /	Belize Fisheries Depai	rtment	3.2	.5	81.3
Poor: 0 – 25%	Fair: >25% - 50%	Moderate: > 50% - 1	75%	Very G	ood: > 75%



Figure 48: Section Seven – Financial and Capital Management Relative scores per management regime

(v) Section Seven Conclusions

- Adequacy of financing for protected area management is a significant limiting factor for the protected area system, particularly for the terrestrial protected areas.
- The use of partnership and co-management mechanisms by the Fisheries and Forest Departments is effective in accessing funding that would not otherwise be available for protected area management, but greater national investment in system-level support (particularly enforcement) is critically needed.
- Financial management is generally good amongst NGOs and the management authorities, though often very weak amongst CBOs.

 Co-management NGOs and CBOs remain too dependent upon grant funds, greater focus is needed for the development of income generating mechanisms to increase financial sustainability and security.

(vi) Section Seven Recommendations

The adequacy of available funds is the weakest area in the section dealing with financial and capital management. The adopted policy of the Government of Belize to incorporate public participation in protected area management through co-management partnerships, is inevitably less cost effective than it would be to have a single governmental body managing all the protected areas – but, on the plus side, does allow access to significant grant funds that would not otherwise be available. Thus whilst competition for management funds amongst comanagement organizations limits availability to individual organizations, the sum total available is greatly in excess of what other options might yield. Past relatively readily available grant funding has however engendered a climate of dependency amongst the NGO and CBO comanagers, with inadequate development of financial sustainability mechanisms through entrance, user and concession fees. With few exceptions, Belize's protected areas remain under-used in terms of visitation and income-generation potential - a situation perceived by uninformed politicians as being reflective of redundancy. There is therefore a pressing need from many standpoints to identify site and system level tools for financial sustainability with increased ecologically sustainable income generation for the protected areas, towards more effective management, and decreasing political vulnerability.

A number of key strategies for strengthening the protected area system have been identified

- Greater investment in the Protected Areas Management programme of the Forest
 Department should be prioritized within the budget of the MNREI.
- Protected areas co-managers should strengthen business planning and broaden marketable services available to broaden income base.
- Where practicable, grant funds (especially PACT) should be systematized to fill site and system-level gaps in management, and core operational costs, and / or identified gaps in management in core protected areas, with less focus on project based funding.
- Payment for Environmental Services (including carbon sequestration) should be established as a mechanism to provide financing and financial sustainability for protected areas management.

Financial

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- Investigate partnerships for financial sustainability ²⁹
- Using regional and global examples of highly effective protected area management, develop and implement financial sustainability plans for protected areas to increase ecologically sustainable visitation and/or resource use, to generate greater entrance, service and concession fees and associated income, to increase availability of management funding.
- Strengthen implementation of system-level programmes (such as those of the Conservation Action Plans for the Maya Mountains Massif, the Maya Mountains Marine Corridor, and the Southern Belize Reef Complex), to reduce duplication of effort and expenditure – and thereby increase the availability of funding for other site-level management activities.
- Using site-level management planning, prioritize financial expenditures that directly strengthen the primary mandate of biodiversity conservation, and the support mechanisms for such – whilst striving to minimize associated organizational and administrative overheads.

²⁹ For example, the Guiana Shield Initiative, linking Guiana with the Netherlands. TEEB report (2009):





Wildtracks, 2009 131

5. National Results per Theme

The indicators are grouped and then analyzed according to one of three WCPA indicator categories:

- Socio-economic indicators
- Administrative indicators
- Biophysical indicators

...within which they are divided into the WCPA elements of evaluation:

- Context
- Planning
- Inputs
- Processes
- Results
- Impacts

The results for each WCPA evaluation element and indicator group have then been analyzed using the following scale, considered to be relevant to the Belize context:

Very poor management effectiveness	≤25%
Poor management effectiveness	26% - 50%
Moderate management effectiveness	51% - 75%
Satisfactory / Good management effectiveness	> 75%

5.1 Assessment of socio-economic indicators of management effectiveness

With an overall percentage of 53.2% (Table 44), the protected areas are considered to have a **MODERATE** level of management effectiveness in the area of socio-economic issues.

Table 44: Socie	o-economic Indicators	
Context	1.4 Inventory of social, cultural and economic con	2.07
Context	1.5 Resource Use and Occupancy	2.39
Context	3.8 Strength of social capital	2.30
	% for Context	56.3%
Planning	3.1 Communication Activities	2.44
Planning	3.3 Educational activities	2.39
	% for Planning	60.5%
Inputs	3.7 Volunteer programme	2.36
	% for Inputs	59.0%
Processes	2.4 Tenure claim conflict resolution activities	2.00
Processes	3.2 Stakeholder engagement	2.15
Processes	3.4 Dissemination of knowledge and information	2.46
Processes	3.5 Level of stakeholder participation in management	2.21
Processes	3.6 Local actors leading protected area management	1.51
Processes	3.9 Existence of capacity building strategy	1.98
Processes	3.10 Existence of socio-economic benefits strategy	2.07
Processes	5.4 Advisory Committee	1.74
	% for Processes	50.7%
Impacts	3.11 Extent of local benefits	2.26
Impacts	3.12 Sustainable use for economic benefit	1.38
Impacts	3.13 Employment in activities related to the protected area	2.20
Impacts	3.14 Local recognition of protected area benefits	2.10
	% for Impacts	50.1%
	Overall	53.2%





Table 45: S	ocio-Economic Indicators				
Score	Results				
0 - 1	No indicators scored 1 or below				
	5 indicators scored between 1 and 2:				
	2.4: Tenure claim conflict resolution activities				
3.6: Local actors leading protected area management					
3.9: Existence of capacity building strategy					
1-2	3.12: Sustainable use for economic benefit				
	5.4: Advisory Committee				
	Management of the majority of the protected areas requires strengthening in their ability				
	to meaningfully incorporate local participation and provide socio-economic b	enefits.			
	13 indicators scored between 2 and 3, suggesting that protected areas in Belize				
2 2	fulfilling to some extent their mandate to ensure community participation	and benefits			
2-3	through communication, education and capacity building strategies, to ensur	e meaningful			
	participation.				
3_1	No indicator scored above 3, indicating that there is a need for strengthening	of the socio-			
5-4	economic outputs of protected area management.				
	Average Overall Score	2.13			

Table 46: Socio	Table 46: Socio-Economic Evaluation Elements				
Evaluation Element	%	Comment			
Context	56.3%	Protected area managers in Belize generally have access to information on the socio-economic context of the area in which they operate, though this could be strengthened. Many local stakeholders, particularly primary stakeholder communities, often have limited capacity for effective participation in management decisions			
Planning	60.5%	The majority of protected area managers are aware of the need for communication with local stakeholders and education activities in adjacent communities, especially for long term viability and sustainability – and yet funding limitations have led to weaknesses within this area, with many protected areas having strategies in place, but limited staff and funds for implementation. This area needs greater strengthening in Belize, and higher prioritization as a protected area activity.			
Inputs	59.0%	Whilst many protected areas have associated volunteer programmes, these are often geared more towards international volunteers than local stakeholders, with organizations benefiting from capacity building skills through organizations such as Peace Corps or GVI, or assistance with construction (and associated leverage of funds) with expedition groups such as Trekforce. At local community level, volunteering is often still a luxury. In other community-based organizations, however, the entire management body is often volunteer-based. Whilst these organizations are very committed, they tend to have less time available for site management activities.			
Processes	50.7%	Strategies to ensure community participation, increased stakeholder communication, understanding, and stakeholder benefit are key goals under the NPAPSP, and are being built into new management plans. Nationally, this area is still weak, however, and in need of strengthening.			
Impacts	50.1%	An area that needs further strengthening through increased emphasis on socio-economic benefit strategies. This does have to be balanced however with the recognition that protected area managers are not solely responsible for the development of socio-economic benefits within local communities, and that this is not their primary mandate.			
		Overall 53.2%			

Administratio	n Indicators	
Context	1.6 Inventory: Tenures and Claims	2.00
Context	1.8 Systematic threat assessment	2.53
Context	2.1 Legal status	3.80
Context	2.2 Boundary survey and demarcation	3.03
Context	7.6 Area accessibility	2.72
	% for Context	72.1%
Planning	2.5 Guidelines and best management practices exist	2.69
Planning	4.1 Management plan	2.34
Planning	4.2 Operational plan	2.00
Planning	4.4 Identification of long term management needs	2.36
Planning	5.1 Protected area objectives	3.00
	% for Planning	62.0%
Inputs	6.1 Qualified site manager	2.90
Inputs	6.2 Site manager availability (part time / full time)	2.67
Inputs	6.3 Administrative staff	2.80
Inputs	6.4 Technical, scientific and professional staff	2.25
Inputs	6.5 Operational staff	2.48
Inputs	7.1 Funding adequate for management	2.21
Inputs	7.4 Infrastructure adequate for management	2.60
Inputs	7.5 Equipment adequate for management	2.48
Inputs	7.7 Signage adequate for management	2.05
	% for Inputs	62.2%
Processes	2.3 Permit approval process	2.93
Processes	2.6 Natural resource management	2.75
Processes	2.7 Surveillance activities	2.71
Processes	2.8 Enforcement activities	2.74
Processes	2.9 Visitor and tourism management activities	2.41
Processes	2.10 Visitor and tourism monitoring programme	2.20
Processes	4.3 Regulation and implementation of management zones	2.54
Processes	4.5 Programme monitoring and evaluation	2 4 2
		2.13
Processes	4.6 Research Programme	1.84
Processes Processes	4.6 Research Programme 5.2 Co-management agreements	2.13 1.84 2.43
Processes Processes Processes	4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy	2.13 1.84 2.43 3.22
Processes Processes Processes Processes	4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors	2.13 1.84 2.43 3.22 3.00
Processes Processes Processes Processes Processes	4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms	2.13 1.84 2.43 3.22 3.00 2.82
Processes Processes Processes Processes Processes Processes	 4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms 6.7 Training and development activities 	2.13 1.84 2.43 3.22 3.00 2.82 2.68
Processes Processes Processes Processes Processes Processes Processes	 4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms 6.7 Training and development activities 7.2 Revenue generation 	2.13 1.84 2.43 3.22 3.00 2.82 2.68 2.43
Processes Processes Processes Processes Processes Processes Processes Processes	 4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms 6.7 Training and development activities 7.2 Revenue generation 7.3 Financial management 	2.13 1.84 2.43 3.22 3.00 2.82 2.68 2.43 3.02
Processes Processes Processes Processes Processes Processes Processes Processes Processes	 4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms 6.7 Training and development activities 7.2 Revenue generation 7.3 Financial management 7.8 Maintenance adequate for management 	2.13 1.84 2.43 3.22 3.00 2.82 2.68 2.43 3.02 2.48
Processes Processes Processes Processes Processes Processes Processes Processes	4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms 6.7 Training and development activities 7.2 Revenue generation 7.3 Financial management 7.8 Maintenance adequate for management % for Processes	2.13 1.84 2.43 3.22 3.00 2.82 2.68 2.43 3.02 2.48 65.0%
ProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcesses	4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms 6.7 Training and development activities 7.2 Revenue generation 7.3 Financial management 7.8 Maintenance adequate for management % for Processes 6.6 Human resource assessment	2.13 1.84 2.43 3.22 3.00 2.82 2.68 2.43 3.02 2.48 65.0% 1.79
ProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesProcessesResultsResults	4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms 6.7 Training and development activities 7.2 Revenue generation 7.3 Financial management 7.8 Maintenance adequate for management <i>% for Processes</i> 6.6 Human resource assessment 6.8 Staff satisfaction	2.13 1.84 2.43 3.22 3.00 2.82 2.68 2.43 3.02 2.48 65.0% 1.79 2.54
Processes Processes Processes Processes Processes Processes Processes Processes Processes Results Results	4.6 Research Programme 5.2 Co-management agreements 5.3 Administrative autonomy 5.5 Board of Directors 5.6 Interorganizational mechanisms 6.7 Training and development activities 7.2 Revenue generation 7.3 Financial management 7.8 Maintenance adequate for management <i>% for Processes</i> 6.6 Human resource assessment 6.8 Staff satisfaction <i>% for Results</i>	2.13 1.84 2.43 3.22 3.00 2.82 2.68 2.43 3.02 2.48 65.0% 1.79 2.54 53.8%

5.2 Assessment of administration indicators of management effectiveness



Administrative indicators

Figure 50: Range of averaged scores for Administrative indicators for the assessed protected areas

Table 47: Administrative Indicators				
Score	Results			
0 - 1	No indicators scored 1 or below			
1 - 2	4 indicators scored between 2 and 3:			
	1.6: Inventory: Tenures and Claims			
	4.2: Operational plan			
	4.6: Research Programme			
	6.6: Human resource assessment			
2 2	The majority (29 of 38 – or 76%) of indicators score between 2 and 3,	, indicating a		
2 - 5	moderate level of management effectiveness in the area of Administration	n.		
	4 Indicators score between 3 and 4, indicating particular strengths in the protected			
	areas system. This is primarily based on the well established legal frame	ework within		
3 - 4	which the national protected areas operate.			
	2.1: Legal Status			
	2.2: Boundary survey and demarcation			
	5.3: Administrative autonomy			
	7.3: Financial management			
	Average Overall Score	2.57		

Table 48: Administration Evaluation Elements					
Evaluation Element	%	Comment			
Context	72.0%	The legislation in Belize provides a strong framework for management, with the national protected areas well established through Statutory Instruments. There has been recognition of the importance of demarcating boundaries for enforcement purposes, and in most protected areas, management bodies are aware of current and potential threats. It is only recently, however, that protected areas have used systematic threat assessments to identify, evaluate and prioritize threats, allowing much greater incorporation of this data into management planning.			
Planning	62.0%	Whilst many protected areas have management plans, these are often out of date, too general to give guidance, or not referred to. Launchpad, in its assessment of management capacity, identified the need for fulfillment of co-management organization obligations to develop a management plan as part of the co-management agreement. Management objectives are developed by most management organizations, but often only for site level concerns, with no reference to national strategies			
Inputs	62.2%	With a score of 55.2%, inputs can only be considered as moderate, with many protected areas limited by funding and/or staff.			
Processes	64.9%	Many of the processes required for effective management of protected areas are in place, but are limited by lack of staff, finances and/or resources. Monitoring and evaluation – particularly important in ensuring adaptive management – scores only slightly above 2, and has been identified as a weakness within the protected area system, with many protected area managers lacking not only the technical capacity to implement monitoring and evaluation processes, but even to have a basic understanding of what these processes involve, and why they should be implemented. As a more structured framework is developed for Belize's protected areas,			
Results	53.8%	more protected areas will use tools such as human resource assessments (6.6) for monitoring staff performance and motivation.			
Overall 64.2%					

With an overall percentage of 64.2% (Table 48), the assessed protected areas can be said to have a **MODERATE** level of management effectiveness overall in the area of administration.

5.3 Assessment of biophysical indicators of management effectiveness

With an overall percentage of 58.1% (Table 49), the protected areas assessed can be said to have a **MODERATE** level of management effectiveness overall in the area of biophysical information, conservation planning, and information management.

Table 49: Biophysical Indicators				
Context	1.1 Inventory of physical environment	2.72		
Context	1.2 Inventory of biotic environment	2.43		
Context	1.3 Inventory of cultural and archaeological resources	1.98		
Context	1.9 Traditional knowledge	1.90		
	% for Context	56.5%		
Planning	1.7 Conservation targets identified	2.78		
	% for Planning	69.5%		
Inputs	1.10 Information management system	2.53		
	%	56.5%		
Processes	1.11 Environmental monitoring activities	2.33		
Processes	1.12 Scientific research activities	1.93		
	%	53.3%		
	Overall	58.1%		



Biophysical indicators

Figure 51: Range of scores for Biophysical indicators

Table 50: Biophysical Indicators			
Score	Results		
0 - 1	No indicators scored 1 or below		
	3 indicators scored between 1 and 2:		
	1.3: Inventory of cultural and archaeological resources		
	1.9: Traditional knowledge		
1 - 2	1.12: Scientific research activities		
	Few protected area managers focus on inventorying cultural and archaeological		
	resources, with much of the information being lost, as sites throughout Belize are looted.		
	Similarly, incorporation of local traditional knowledge into management planning is not		
	being implemented in the majority of protected areas, with much of the knowledge of the		
	historical condition of biodiversity also being lost.		
	The majority of protected area managers do not consider they have sufficient resources		
	to conduct scientific research, and many consider it a luxury. The majority of research		
	conducted within the protected areas system is through research partnerships with		
	overseas institutions – primarily from the US or UK.		
2.2	The remaining five indicators scored between 2 and 3, rating as Moderate, and would		
2-5	benefit from some strengthening		
3 - 4	No indicator scored above 3.		
	Average Overall Score 2.32		

Table 51: Biophysical Evaluation Elements					
Evaluation Element	%	Comment			
Context	56.5%	Biophysical, cultural and archaeological knowledge of the areas being managed is gradually being strengthened, with an increasing number of protected areas conducting rapid environmental assessments prior to management planning to ensure adequate information for management. In many protected areas, however, this information is not readily available, or is out of date. There is, however, now the recognition that this information is critical before an effective management plan can be developed			
Planning	69.5%	The number of protected area management organizations that have identified conservation targets and threats through conservation planning exercises is increasing as more protected areas have updated management plans. Some system level planning has also been achieved (MMM, MMMC, SBRC), providing system level strategies for conservation. Rigorous conservation planning for management, however. Still requires further strengthening - both within the individual protected areas, and at a landscape level.			
Inputs	63.1%	Information management is improving in the larger organizations, but still requires strengthening within the smaller organizations, where there is a need for the technical skills required for using information management systems effectively.			
Processes	53.3%	The level of functional scientific research within the majority of the protected areas is considered weak for supporting conservation management.			
		Overall 58.1%			

5.4 Overall Summary

Table 52: Evaluation Elements Summarized				
	Average	%		
	Score	effective		
Socio Economic Indicators	2.13	53.2		
Administrative Indicators	2.56	64.2		
Biophysical Indicators	2.32	58.1		
OVERALL	2.41	60.3%		

With a score of 2.41 (60.3%), overall management effectiveness is considered to be **MODERATE** (Table 52) within the WCPA rating system. All areas need strengthening to reach the level of **SATISFACTORY**.

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6. Strengthening the Monitoring Tool

Recommendations:

- The development and implementation of a National Biodiversity Monitoring Protocol should be harmonized with the need to secure reliable and rigorous quantitative data on biodiversity indicator species and ecosystems, and be designed with adequate resolution to be able to detect changes sufficiently rapidly to inform adaptive management.
- Protected Area managers and staff should be adequately trained in species identification and use of the monitoring protocol to be able to develop a high level of proficiency in its use, and to provide reliable quantitative biodiversity data for future assessments.
- The National Management Effectiveness Assessment Tool should be further refined to fully utilize quantitative monitoring data as it becomes available.

It is evident that the capacity of most protected area staff to assess biodiversity is a significant limiting factor to the reliability and use of 'self-assessed' data. Knowledge gaps of indicator species occurring within the respective protected areas were frequent across the system, and information sometimes erroneous. There is a limit to how much support in conducting the assessment can overcome these capacity limitations, and in general the approach has been to not include data that is considered unreliable. Beyond this though is the need to systematically validate such self-assessment data. It is apparent that protected area managers have insufficient historical knowledge of some indicators to be able to gauge current status, or have a limited understanding of some indicator species and threats.

- The overall assessment of sea turtle populations as being GOOD, for example, is considered inappropriate (validation placed them at mid-FAIR, as a conservative assessment – they perhaps should be rated lower still).
- Validation for the Coral ecosystem also rated it as FAIR (rather than GOOD), in keeping with the overall ratings of the Healthy Reef Initiative.
- Few marine protected area managers rated climate change amongst the top four threats, indicative of a lack of awareness of the scope and severity of that threat, and a focus on short term, immediate threats.

Where practicable, these perceived erroneous ratings have been identified, validated and adjusted accordingly.

Recommendations:

- Capacity building is needed for protected area managers and staff in the areas of biodiversity within the respective protected areas, species identification, historical population dynamics, the recognition of the magnitude of broad-scale threats (such as climate change), etc.
- Revision of the National Management Effectiveness Assessment Tool should include greater specificity regarding the biodiversity indicators, and to fully utilize quantitative monitoring data as it becomes available as protected area staff develop greater capacity and implement a National Biodiversity Monitoring Protocol.

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Annex 1: Management Regimes		
Co-management Partner	Protected Area	Management Authority
NGO co-management		
Sarstoon Temash Institute for Indigenous Management	Sarstoon Temash National Park	Forest Department
Toledo institute for Development and Environment	Port Honduras Marine Reserve	Fisheries Department
	Payne's Creek National Park	Forest Department
Southern Environmental Association	Gladden Spit and Silk Cayes Marine Reserve	Fisheries Department
	Sapodilla Cayes Marine Reserve	Fisheries Department
	Laughingbird Caye National Park	Forest Department
Belize Audubon Society	Blue Hole Natural Monument	Forest Department
	Half Moon Caye Natural Monument	Forest Department
	Guanacaste National Park	Forest Department
	St. Herman's Blue Hole National Park	Forest Department
	Cockscomb Basin Wildlife Sanctuary	Forest Department
	Victoria Peak Natural Monument	Forest Department
	Tapir Mountain Nature Reserve	Forest Department
	Crooked Tree Wildlife Sanctuary	Forest Department
	Actun Tunich Muknal Natural Monument	Forest Department / IoA ³⁰
Friends for Conservation and Development	Chiquibul National Park	Forest Department
Ya'axché Conservation Trust	Bladen Nature Reserve	Forest Department
Green Reef	Bacalar Chico National Park	Forest Department

³⁰ IoA: Institute of Archaeology

Co-management Partner	Protected Area	Management Authority
CBO co-management		
Sarteneja Alliance for Conservation and Development	Corozal Bay Wildlife Sanctuary	Forest Department
Friends of Swallow Caye	Swallow Caye Wildlife Sanctuary	Forest Department
Forest and Marine Reserve Association of Caye Caulker	Caye Caulker Forest Reserve	Forest Department
	Caye Caulker Marine Reserve	
Gales Point Wildlife Sanctuary Community Management	Gales Point Wildlife Sanctuary	Forest Department
Committee		
Itzamna Society / Belize Development Foundation*	Noj kaax Me'en Elijio Panti National Park	Forest Department
Steadfast Tourism and Conservation Association (STACA)	Billy Barquedier National Park	Forest Department
Friends of Gra-Gra Lagoon	Gra-Gra Lagoon National Park	Forest Department
Guardians of the Jewel	Monkey Bay National Park	Forest Department
Aguacaliente Management Team	Aguacaliente Wildlife Sanctuary	Forest Department
Friends of Mayflower Bocawina	Mayflower Bocawina National Park	Forest Department
Friends of Five Blues Lake National Park	Five Blues Lake National Park	Forest Department
Gracie Rock Reserve for Adventure, Culture & Eco-Tourism	Peccary Hills National Park	Forest Department
(GRACE)		
Friends of Rio Blanco	Rio Blanco National Park	Forest Department
Rancho Dolores Development Group	Spanish Creek Wildlife Sanctuary	Forest Department

Co-management and Management partners of national protected areas in Belize

Co-management Partner	Protected Area	Management Authority
Logging Concession Holders		
Bull Ridge Company	Chiquibul Forest Reserve	Forest Department
Gomez and Sons	Deep River Forest Reserve	Forest Department
The Wood Depot	Deep River / Mango Creek (1) Forest Reserves	Forest Department
Yong	Mango Creek (4)	Forest Department
	Swasey-Bladen Forest Reserves	Forest Department
Sellars	Maya Mountain Forest Reserve	Forest Department
Pine Lumber Company	Mountain Pine Ridge Forest Reserve	Forest Department
Madera Development Group	Sibun Forest Reserve	Forest Department
New River Enterprises	Sittee River Forest Reserve	Forest Department

Co-management and Management partners of national protected areas in Belize

Private Protected Area	Protected Area	Management Authority
Private Landowners		
Spanish Lookout	Aguacate Lagoon ³¹	Private
TIDE	Block 127	Private
Bermudian Landing	Community Baboon Sanctuary	Private
Ya'axché Conservation Trust	Golden Stream	Private
Monkey Bay	Monkey Bay	Private
Programme for Belize	Rio Bravo C&MA	Private
Birds Without Borders	Runaway Creek	Private
International Tropical Conservation Foundation	Shipstern Nature Reserve	Private

Private Protected Area Managers

³¹ Non participatory

Direct Government Management	Protected Area	Management Authority
Direct Management by Government of Belize		
Forest Department	Columbia River Forest Reserve ³²	Forest Department
	Fresh Water Creek Forest Reserve	Forest Department
	Grant Works Forest Reserve ³³	Forest Department
	Machaca Forest Reserve	Forest Department
	Manatee Forest Reserve	Forest Department
	Monkey Caye Forest Reserve ²³	Forest Department
	Burdon Canal Nature Reserve	Forest Department
	Honey Camp National Park	Forest Department
	Aguas Turbias National Park ³⁴	Forest Department
	Thousand Foot Falls Natural Monument	Forest Department
	Vaca Forest Reserve	Forest Department
Direct Management by Government of Belize	·	
Belize Fisheries Department	Bacalar Chico National Park	Fisheries Department
	Caye Caulker Marine Reserve	Fisheries Department
	Glover's Reef Marine Reserve	Fisheries Department
	Hol Chan Marine Reserve	Fisheries Department
	South Water Caye Marine Reserve	Fisheries Department

 ³² Atlantic Industries Ltd. have a long term logging concession that is currently in dispute
 ³³ Considered Defunct
 ³⁴ No active co-management partner

Annex 2: Linking National Indicators to Regional Initiatives

Under the National Protected Areas Policy and System Plan, management effectiveness is evaluated through the **Monitoring Package for Assessing Management Effectiveness of Protected Areas** (Young et. al. 2005), based on seven different indicator categories, and (within this assessment) 64 indicators. Each indicator has been linked to one of the six **evaluation elements** of the World Congress of Protected Areas (WCPA) framework for assessment, developed to encourage international standards for assessment and reporting, and harmonies assessment around the world.

Evaluation Element Framework (World Commission of Protected Areas)			
Elements of Evaluation	Explanation	Criteria that are assessed	
Context	Where are we now? Assessment of importance, threats and policy environment	 Significance (Cultural, biological, economic) Threats (Internal, external, resource extraction) Vulnerability (Legal status, demarcation, fragility) National Context (Political) 	
Planning	Where do we want to be? Assessment of protected area design and planning	 Protected area legislation and policy Protected area system and design (comprehensive, representative, connectivity and viability) Reserve design (Viability, connectivity, land tenure, traditional use) Management planning (Clear objectives and management plans, identification of resources) 	
Inputs	What do we need? Assessment of resources needed to carry out management	 Resources of agency (Staff, funds, equipment, infrastructure) Resources of site (Staff, funds, equipment, infrastructure) 	
Processes	How do we go about it? Assessment of the way in which management is conducted	 Suitability of management processes (Maintenance, control and protection, training, education, research, monitoring and evaluation, visitor management, natural resource management, conflict resolution, personnel management, control of budgets and finance) 	
Results	What are the results? Assessment of the implementation of management programmes and delivery of products and services	 Results of management actions (Evaluation of management plan implementation, annual plans, and annual budgets) Services and products (Quantification of goods and services generated by the management process) 	
Impacts	What did we achieve? Assessment of the outcomes and the extent to which they achieved objectives	 Impacts: effects of management in relation to objectives (Qualitative and quantitative impacts, impacts of management plans etc. in relation to the objectives and the management category). 	

Annex 3: National Indicators and WCPA Indicator Alignment

Each national indicator has been linked to one of the six **evaluation elements** of the IUCN World Commission of Protected Areas (WCPA) framework for assessment, developed to encourage international standards for assessment and reporting, and harmonize assessment around the world.

1. Resource Inventory	Score	Evaluation Element
1.1 Inventory of physical environment		Context
1.2 Inventory of biotic environment		Context
1.3 Inventory of cultural and archaeological resources		Context
1.4 Inventory of social, cultural and economic context		Context
1.5 Resource Use and Occupancy		Context
1.6 Inventory: Tenures and Claims		Context
1.7 Conservation targets identified		Planning
1.8 Systematic threat assessment		Context
1.9 Traditional knowledge		Context
1.10 Information management system		Inputs
1.11 Environmental monitoring activities		Processes
1.12 Scientific research activities		Processes

2. Resource Administration, Management and Protection		
2.1 Legal status		Context
2.2 Boundary survey and demarcation		Context
2.3 Permit approval process		Processes
2.4 Tenure claim conflict resolution activities		Processes
2.5 Guidelines and best management practices exist		Planning
2.6 Natural resource management		Processes
2.7 Surveillance activities		Processes
2.8 Enforcement activities		Processes
2.9 Visitor and tourism management activities		Processes
2.10 Visitor and tourism monitoring programme		Processes

3. Participation, Education and Socio-Economic Benefit	Score	Evaluation Element
3.1 Communication Activities		Planning
3.2 Stakeholder engagement		Processes
3.3 Educational activities		Planning
3.4 Dissemination of knowledge and information		Processes
3.5 Level of stakeholder participation in management		Processes
3.6 Local actors leading protected area management		Processes
3.7 Volunteer programme		Inputs
3.8 Strength of social capital		Context
3.9 Existence of capacity building strategy		Processes
3.10 Existence of socio-economic benefits strategy		Processes
3.11 Extent of local economic benefits		Impacts
3.12 Sustainable use for economic benefit		Impacts
3.13 Employment in activities related to the protected area		Impacts
3.14 Local recognition of protected area benefits		Impacts

4. Management Planning	Evaluation Element
4.1 Management plan	Planning
4.2 Operational plan	Planning
4.3 Regulation and implementation of management zones	Processes
4.4 Identification of long term management needs	Planning
4.5 Programme monitoring and evaluation	Processes
4.6 Research Programme	Processes

5. Governance	Score	Evaluation Element
5.1 Protected area objectives		Planning
5.2 Co-management agreements		Processes
5.3 Administrative autonomy		Processes
5.4 Advisory Committee		Processes
5.5 Board of Directors		Processes
5.6 Interorganizational mechanisms		Processes

6. Human Resources	Score	Evaluation Element
6.1 Qualified site manager		Inputs
6.2 Site manager availability (part time / full time)		Inputs
6.3 Administrative staff		Inputs
6.4 Technical, scientific and professional staff		Inputs
6.5 Operational staff		Inputs
6.6 Human resource assessment		Results
6.7 Training and development activities		Processes
6.8 Staff Satisfaction		Results

7. Finance and Capital Management		Evaluation Element
7.1 Funding adequate for management		Inputs
7.2 Revenue generation		Processes
7.3 Financial management		Processes
7.4 Infrastructure adequate for management		Inputs
7.5 Equipment adequate for management		Inputs
7.6 Area accessibility		Context
7.7 Signage adequate for management		Inputs
7.8 Maintenance adequate for management		Processes

Annex 4: National State of Protected Areas Assessment (Terrestrial Protected Areas)

Are we conserving our biodiversity?

This question is key to Belize's national conservation objectives, and commitment to the Convention of Biological Diversity. It is to be answered through the following assessment, which collects information on the state of biodiversity across Belize's protected areas, and provides an updated assessment of management effectiveness.

We welcome your participation in this process, both through provision of information and through participation at the workshop.

Background Information on	the Protected Area
Name of Protected Area	
Management Authority	
Date of Establishment	
Reason for Establishment A clearly stated and clearly understood reason for establishment	
System-level Management Unit (if applicable)	
Co-management Agency	
Co-Management Agency status	 Government NGO CBO - Registration under Business Names Other
Type of co-management agreement	 Current co-management agreement Lapsed co-management agreement Interim co-management agreement Pending co-management agreement Long-term forest license Other
Date of first co-	
Date of most recent co- management agreement	

1.1 Inventories	No useful inventories and/or maps exist on the physical environment of the protected area	1
Physical Environment	Some inventories and/or maps have been completed on the physical environment. However, this information is either out-of-date, poorly documented, very limited in scope and quality, dispersed, or difficult to access, and/or otherwise not <i>sufficient</i> for management	2
	Most needed baseline inventories and/or maps on the physical environment have been completed, with data readily accessible for management purposes. However survey work to keep data up-to-date is not being done.	3
	Essential baseline inventories and/or maps on the physical environment have been completed, with data readily accessible for management purposes. Data is regularly updated from ongoing survey work.	4

Section 1: Do we have the information we need for effective management?

hich of the following maps are available within the management / co-management organization?
□ Geology
Watersheds / rivers
Access to and within protected area
Key Features
Landscape in which pa is situated

1.2 Inventories	No useful inventories and/or maps exist on the physical environment of the protected area	1
Biotic Environment	Some inventories and/or maps have been completed on the physical environment. However, this information is either out-of-date, poorly documented, very limited in scope and quality, dispersed, or difficult to access, and/or otherwise not <i>sufficient</i> for management	2
	Most needed baseline inventories and/or maps on the physical environment have been completed, with data readily accessible for management purposes. However survey work to keep data up-to-date is not being done.	3
	Essential baseline inventories and/or maps on the physical environment have been completed, with data readily accessible for management purposes. Data is regularly updated from ongoing survey work.	4

Which of the following are available within the management / co-management organization?			
Maps	Inventories		
Ecosystems	Ecosystems	Year updated:	
	Mammals	Year:	
	🗆 Birds	Year:	
	Reptiles	Year:	
	Amphibians	Year:	
	🗆 Fish	Year:	

Indicator Species with	in the Prot	ected Are	ea						
<u>Column A</u> Please enter :	mn A Spe		ecies		Seen in 2009 (√)	VG	G	F	Р
✓ Present (stable /		Wh	ite-lipped Pe	eccary					
increasing)		Bai	rd's Tapir						
✓ Present (decreasing	g)	Sca	rlet Macaw						
x Absent (if present		Hic	atee						
historically)		Mo	untain Mulle	et					
n/a Not Applicable (ne	ever	Oce	ellated Turke	у					
present		Gre	at Curassow						
Rating		Cre	sted Guan						
VG: Very Good. Doesr	ı't	Hov	wler Monkey	,					
need human intervent	ion	Spie	der Monkey						
G: Good: Populations		Jag	uar						
reduced, but should re	ecover	Yell	ow headed I	Parrot					
with limited human		Wh	ite tailed De	er					
intervention		Tila	pia						
F: Fair: Populations wi	11	Xat	é						
decline if there is no h	uman	Popta (Acoelorraphe)							
intervention		Wa	Wano (Sabal)						
P: Poor: Populations are in danger of disappearing from the area, even with human Intervention		West Indian Manatee							
Presence of Importan	t Bird Nesti	ing Coloni	ies						
Number of colonies w area:	ithin prote	cted	Trend Data:	Increa Stable Decrea	ised ↑ e - ased ↓				
Colony	Trend Data	Species							
Colony One									
Colony Two									
Colony Three									

1.3 Inventories	No useful inventories and/or maps exist on the cultural and archaeological resources of the protected area	1
Cultural and Archaeological Resources	Some inventories and/or maps have been completed on the cultural and archaeological resources. However, this information is either out-of-date, poorly documented, very limited in scope and quality, dispersed, or difficult to access, and/or otherwise not <i>sufficient</i> for management	2
	Most needed baseline inventories and/or maps on the cultural and archaeological resources have been completed, with data readily accessible for management purposes. However survey work to keep data up-to-date is not being done.	3
	Essential baseline inventories and/or maps on the cultural and archaeological resources have been completed, with data readily accessible for management purposes. Data is regularly updated from ongoing survey work.	4

Which of the following are available within the manage	ement / co-management organization?
Maps	Inventories
Archaeological Sites	Archaeological Sites Year:
Scenic Features	Caves
Features of cultural significance	
Key Identified Cultural and Archaeological Assets on Si	te
1.	
2.	
3.	
4.	

1.4 Inventories	No useful inventories exist on the social, cultural and economic resources of the protected area	1
Social, Cultural and Economic Resources	Some <i>required inventories</i> have been completed on the social, cultural and economic resources. However, this information is either out-of-date, poorly documented, very limited in scope and quality, dispersed, or difficult to access, and/or otherwise not <i>sufficient</i> for management	2
	Most <i>required inventories</i> on the social, cultural and economic resources have been completed and are kept up-to-date. However, this information has not yet been comprehensively documented and mapped, and is not <i>sufficient</i> in key areas for management	3
	Essential <i>required inventories</i> on the social, cultural and economic resources have been completed, are kept up-to-date, and are fully <i>sufficient</i> for management	4

Key Stakeholder Communities					
Community	Population (if	Supportive	Ambivalent	Negative	
	KIIOWII)	Please tick appropriate box			

Which of the following are available within the management / co-management organization?			
Maps Stakeholder communities 	Reports Socio-economic Assessment Year:		

1.5 Inventories	No useful information exists on existing resource uses and occupancy in the protected area	1
Resource Use and Occupancy	Some <i>required inventories</i> have been completed on current resource uses and occupancy. However, this information is either out-of-date, poorly documented, very limited in scope and quality, dispersed, or difficult to access, and/or otherwise not <i>sufficient</i> for management	2
	Most <i>required inventories</i> on current resource uses and occupancy have been completed and are kept up-to-date. However, this information has not yet been comprehensively documented and mapped, and is not <i>sufficient</i> in key areas for management	3
	Essential <i>required inventories</i> on current resource uses and occupancy have been completed, are kept up-to-date, and are fully <i>sufficient</i> for management	4

Outline Resource use within Protected Area
Traditional use of protected area
Economic use of protected area
Cultural use of protected area

1.6 Inventory	No useful information exists on agricultural incursions into the protected area	1
Agricultural Incursions	Some <i>required inventories</i> have been completed on agricultural incursions into the protected area. However, this information is either out-of-date, poorly documented, very limited in scope and quality, dispersed, or difficult to access, and/or otherwise not <i>sufficient</i> for management	2
	Most <i>required inventories</i> on agricultural incursions into the protected area have been completed. However, this information has not yet been comprehensively documented and mapped, and is not <i>sufficient</i> in key areas for management	3
	Essential <i>required inventories</i> on agricultural incursions into the protected area have been completed and are fully <i>sufficient</i> for management	4
Please highlight areas	of incursions on protected area map	

1.7 Site Assessment	No conservation targets have been identified for this site	1
	Some conservation targets have been identified, but based on weak	
Conservation	methodology and/or very limited consultation. They are out-of-date	2
Targets	and/or very narrow in scope. They are not <i>sufficient</i> for planning and	2
	management	
If there is no recent	Conservation targets have been identified for the site based on	
conservation	appropriate methodology and consultation. However these targets	2
planning /	are not up-to-date and/or broadly representative enough to be fully	5
management	sufficient for planning and management	
planning, this will	Conservation targets have been identified for the site based on	
rate as 1. And	appropriate methodology and consultation, and are fully sufficient for	4
respondents should	planning and management	4
go on to 1.8		

Identified Conservation Targets		

1.8 Site Assessment	No systematic threat assessment has been conducted for this site	1
	Some threat analyses have been completed but these are weak in	
Systematic Threat	methodology, unsystematic, out-of-date, narrow in scope, and/or	2
Assessment	lacking in consultation. They are not sufficient for management	
	Threat analyses have been conducted based on appropriate	
	methodology and consultation. However these analyses are not up-to-	Э
	date (within the last five years) and/or not adequately systematic or	5
	broad enough in scope to be fully sufficient for management	
	A systematic threat assessment has been conducted within the past	
	five years based on appropriate methodology and consultation. This	Л
	assessment is fully sufficient for management	4

Thr	eats							
Indicate which threats occur within the protected area, and any mitigation activities taking place								
\checkmark	Belize Issues	2007	2008	2009	Mitigation Activities			
	Illegal Hunting							
	Illegal Fishing							
	Illegal Logging							
	Illegal Xaté harvesting							
	Agricultural Incursions							
	Fire							
	Pine Bark Beetle							
	Pet Trade							
	Oil exploration							
	Pollution							
	Adjacent Land Use Change							
	Transboundary Issues							
	Illegal Hunting							
	Illegal Fishing							
	Illegal Logging							
	Illegal Xaté harvesting							
	Agricultural Incursions							
Oth	er Threats							
List	the four highest threats:							
1.								
2.								
3.								
4.								

Threat Assessment Assess the four highe	st id	entified threats below	v					
Threat One:								
Recent History: 🛛 Has 🗆 Has not been a pressure in the <i>last</i> 5 years								
In the past 5 years this activity has:	Ext	ent	Impact	t	Per	manence		
 Increased sharply Increased slightly Remained constant Decreased slightly Decreased sharply 	□ Increased sharply □ Increased slightly □ Remained constant □ Decreased slightly □ Decreased sharply		□ Sev □ Hig □ Mo □ Mil	 Severe (target eliminated) High (target seriously degraded) Moderate (moderately degraded) Mild (slight impact) 		 Permanent (> 100 years) Long term (20-100 years) Medium term (5-20 years) Short term (< 5 years) 		
Current Status				Future Status				
Extent		Impact		Urgency		The probability of the threat occurring is:		
□ Throughout (> 50%) □ Widespread (26-50%) □ Scattered (5-25%) □ Localized (< 5%)		 Severe (target eliminated) High (target seriously degraded) Moderate (measurable impact) Mild (slight impact) 		□ Threat is occurring now (this year) □ Threat may occur in the next 1 – 3 years □ Threat may occur between 3 and 10 years □ Won't bappon in < 10 years		 □ Very High □ High □ Medium □ Low □ Very Low 		
Comments								
Threat Two:								
Recent History:		🗆 Has 🗆 Has n	not l	been a pressure in the <i>last</i> 5 ye	ears			
In the past 5 years this activity has:	Ext	ent	Im	pact	Per	manence		
 □ Increased sharply □ Increased slightly □ Remained constant □ Decreased slightly □ Decreased sharply □ Cocalized (< 5%) 			Severe (target eliminated) High (target seriously degraded) Moderate (moderately egraded) Mild (slight impact)	U U yea	Permanent (> 100 years) Long term (20-100 years) Medium term (5-20 Irs) Short term (< 5 years)			
Current Status				Future Status				
Extent		Impact		Urgency	The thr	e probability of the eat occurring is:		
 □ Throughout (> 50%) □ Widespread (26-50%) □ Scattered (5-25%) □ Localized (< 5%) □ Midd (slight impact) 			sly able)	 □ Threat is occurring now (this year) □ Threat may occur in the next 1 – 3 years □ Threat may occur between 3 and 10 years □ Won't happen in < 10 years 		Very High High Medium Low Very Low		

Threat Three:					
Recent History:		🗆 Has 🗆 Has	not	been a pressure in the <i>last</i> 5 ye	ears
In the past 5 years this activity has:		Impact	Permanence		
 □ Increased sharply □ Increased slightly □ Remained constant □ Decreased slightly □ Decreased sharply □ Localized (< 5%) 		Throughout (> 50%) Videspread (25-50%) icattered (5-25%) ocalized (< 5%)		 Severe (target eliminated) High (target seriously degraded) Moderate (moderately degraded) Mild (slight impact) 	 Permanent (> 100 years) Long term (20-100 years) Medium term (5-20 years) Short term (< 5 years)
Current Status				Future Status	
Extent		Impact		Urgency	The probability of the threat occurring is:
 □ Throughout (> 50%) □ Widespread (26-50%) □ Scattered (5-25%) □ Localized (< 5%) □ Moderate (measurable impact) 		usly Irable It)	 Threat is occurring now (this year) Threat may occur in the next 1 – 3 years Threat may occur between 3 and 10 years Won't happen in < 10 years 	□ Very High □ High □ Medium □ Low □ Very Low	
Comments			-1		
Threat Four:					
Recent History:			not	been a pressure in the <i>last</i> 5 ye	ears
In the past 5 years this activity has:	Exte	ent		Impact	Permanence
□ Increased sharply □ Increased slightly □ Remained constant □ Decreased slightly □ Decreased sharply		□ Throughout (> 50%) □ Widespread (25-50%) □ Scattered (5-25%) □ Localized (< 5%)		 Severe (target eliminated) High (target seriously degraded) Moderate (moderately degraded) Mild (slight impact) 	 Permanent (> 100 years) Long term (20-100 years) Medium term (5-20 years) Short term (< 5 years)
Current Status				Future Status	
Extent Imp		Impact		Urgency	The probability of the threat occurring is:
□ Throughout (> 50%) □ Widespread (26-50%) □ Scattered (5-25%) □ Localized (< 5%)		□ Severe (target eliminated) □ High (target serious degraded) □ Moderate (measura impact) □ Mild (slight impact)	ly able	 Threat is occurring now (this year) Threat may occur in the next 1 – 3 years Threat may occur between 3 and 10 years Won't happen in < 10 years 	 □ Very High □ High □ Medium □ Low □ Very Low

1.9 Traditional Knowledge	No mechanisms exist to incorporate traditional knowledge into planning and management of the site	1
	Mechanisms exist to incorporate traditional knowledge into planning and management , but are poorly designed, incomplete and/or are not being used	2
	Mechanisms to incorporate traditional knowledge into planning and management are being implemented. However these processes are small in scale relative to need, and/or under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for management	3
	Mechanisms to incorporate traditional knowledge into planning and management are being implemented. These processes use a wide array of traditional information, using appropriate information technology. This system is adequate in scale relative to demand, adequately funded, regularly evaluated and <i>sufficient</i> for management	4

List mechanisms used for capturing traditional knowledge and integrating into management
1.
2.
3.

1.10. Information Systems	No system exists to manage information on the site and its features and resources	1
	An information system exists, but it is poorly designed, unordered, incomplete, and/or is not being used	2
	An information system is being implemented. However the system is small in scale relative to need, and/or under-funded, and/or not being evaluated, and therefore is not <i>sufficient</i> for management	3
	An information system is being implemented. It covers a wide array of information, using appropriate technology, including GIS, computer databases, and remote sensing systems, where appropriate. This system is adequate in scale relative to demand, adequately funded, regularly evaluated and <i>sufficient</i> for management	4

List mechanisms used for data management		
1.		
2.		
3.		
Is GIS being incorporated into database information?	Y	N

1.11 Environmental	No environmental monitoring activities exist	1
Monitoring	Environmental monitoring strategies have been developed but are not being implemented (indicate why)	2
Activities	Environmental monitoring activities are being implemented. However,	
Is there systematic monitoring to track changes over time?	these activities are narrow in scope relative to need, under-funded, and/or not being evaluated, and are not <i>sufficient</i> for management	3
	Environmental monitoring activities are being implemented. These activities are adequate in scale relative to demand, adequately funded, regularly evaluated, continuously implemented from year-to-year, and <i>sufficient</i> for management	4

What is being systematically monitored under the environmental monitoring programme?		
1.		
2.		
3.		
4.		
Is monitoring contributing towards any national / regional monitoring Y programme?	N	

1.12 Scientific	No functional scientific research activities exist	1
Research Activities	Functional scientific research strategies have been developed, but are not being implemented (indicate why)	2
	Functional scientific research activities are being implemented. However these activities are narrow in scope relative to need, under-funded, and/or not being evaluated, and are not <i>sufficient</i> for management	3
	Functional scientific research activities are being implemented. These activities are adequate in scale relative to demand, adequately funded, regularly evaluated, continuously implemented from year-to-year, and <i>sufficient</i> for management	4

What scientific research has been carried out in the last two years?
1.
2.
3.
What key research needs have been identified for the next two years?

Section 2: How well are we protecting our natural and cu	Itural resources?
--	-------------------

2.1 Legal Status Legal Status	The site is not recognised in any official declaration or proposal	1
	The site has been proposed or publicly announced, but not otherwise protected	2
	The site is in the process of being legally gazetted or recognized, but the process is not yet complete	3
	The site has been legally gazetted or otherwise legally established	4

Does anyone live within the boundaries of the pa?	Y	Ν
How many (approximately)?		

2.2 Legal Status	The boundaries of the site are not legally defined nor are they legally surveyed or demarcated in the field	1
Boundary Survey and Demarcation	The boundaries have been legally defined in the documents designating or establishing the site, but less than 50% of the planned surveys and demarcation has been completed	2
	The boundaries have been legally defined in the documents designating or establishing the site, and between 50% and 75% of the planned surveys and demarcation has been completed	3
	The boundaries have been legally defined in the documents designating or establishing the site, and at least 75% of the planned surveys and demarcation has been completed	4

2.3 Legal Status	The protected area manager is not involved in the evaluation and permitting of legal uses	1
Permit Approval Process	There are mechanisms for the involvement of the protected area manager in the evaluation and permitting of legal uses, but these are not being implemented	2
	The protected area manager is involved in the evaluation and permitting of some legal uses, but not others. Implementation is therefore not comprehensive	3
	The protected area manager is involved in the evaluation and permitting of all legal uses. The mechanisms for involvement are adequate in scale relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4

What are the primary permitted activities within the protected area?				
1.				
2.				
3.				
4.				
Is there baseline and data on sustainability of permitted resource use?	Yes	Maybe Yes	Maybe No	No
Was the protected area co-management agency involved in the permitting process?	Yes	Maybe Yes	Maybe No	No

2.4 Legal Status	No strategies or activities exist for resolving tenure conflicts	
	A conflict resolution strategy exists, but is not being implemented	2
Tenure Claim	Conflict resolution activities are being implemented. However these	
Conflict Resolution	activities are small in scale relative to need, and/or under-funded and/or	3
Activities	not being evaluated, and therefore are not sufficient for management	
	Conflict resolution activities are being implemented. These activities are	
	adequate in scale relative to demand, adequately funded, regularly	4
	evaluated, and sufficient for management	

2.5 Management	No guidelines and/or policies for best management practices exist	1
Status	Guidelines and/or policies for best management practices are being prepared for some management activities, or alternatively, they exist but need revisions to be consistent with the management plan. They are not	2
Guidelines and Delicies for Best	sufficient for management	
Management Practices	Guidelines and/or policies for best management practices have been completed for most management activities, but are not being fully implemented. These are not <i>sufficient</i> for management without greater implementation	3
	Guidelines and/or best management practices have been completed for most management activities, and these are being fully implemented. They are fully <i>sufficient</i> for management.	4

What policies / guidelines exist to guide the management of the protected area?
1.
2.
3.
4.

Г

2.6 Management	No sustainable resource use strategies exist	1
Status	Practices and intensity of resource use are not established based on approved management strategies, but are proposed	2
Natural Resource Use Management	Practices and intensity of resource use are established based on approved management strategies, but are not monitored	3
(Where applicable)	Practices and intensity of resource use are established based on approved and monitored management strategies	4

2.7 Protection No surveillance strategy exists		1
Surveillance	A surveillance strategy exists, but it is not being implemented (indicate why)	2
Activities	Surveillance activities have adequate personnel and infrastructure support, and are being implemented, but are infrequent (relative to need), do not cover all identified critical areas, and/or under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for management	3
	Surveillance activities are frequently implemented (relative to need), cover all identified critical areas, have adequate personnel and infrastructure support, relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4

Effective Surveillance	
Number of patrols in last quarter	Is the footprint of surveillance patrols sufficient to detect:
Average size of patrol team	 75 - 99% of incursions 50 - 74% of incursions < 50%
% of PA covered by patrols in last quarter%	

2.8 Protection:	No enforcement activities exists		
	Enforcement strategies exist, but are not being implemented		
Enforcement Activities	Enforcement activities have adequate personnel and infrastructure support, and are being implemented, but are infrequent relative to need, do not cover all identified critical areas, and/or are under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for management	3	
	Enforcement activities are frequently implemented (relative to need), cover all identified critical areas, have adequate personnel and infrastructure support, relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4	

Effective Enforcement				
How many rangers have power of arrest?	What agency is responsible for enforcement within the protected area?			
Which of the following training / qualifications do rangers have?	Do rangers feel that they are adequately trained an			
Forest Officer, Number:	Do rangers feel that they are adequately enforcement activities? Are rangers equipped with firearms?		ney are adequately equipped Y / N	
 Fisheries Officer, Number: Fire fighting, Number: 			Y / N	
First Aid. Number:	What collaborative partnerships have been developed towards more effective enforcement?			e been developed
□ Other: 				
Is there an effective mechanism for reporting violations	Yes	Maybe Yes	Maybe No	No
Do visitors generally respect the regulations?	Yes	Maybe Yes	Maybe No	No
Has respect for the protected area regulations increased, decreased or remained the same over the last 5 years?		Increased	Stayed the same	Decreased
Do management staff have authority to charge someone with a violation?		one with a	Y	Ν
How many violations have been reported in the last 2 years?		ears?		
What percentage of violations have beer in the last 2 years?	n successfully p	prosecuted		

2.9 Visitor	No visitor and tourism management strategies or activities exists	
Management	Visitor and tourism management strategies have been developed, but are not being implemented	2
Visitor and Tourism Management Activities	Visitor and tourism management strategies and activities are being implemented. However, these activities are small in scale relative to need, and/or under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for management	3
	Visitor and tourism management strategies and activities are being implemented. These activities are adequate in scale relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4

How many visitors did the protected area have in 2007?	
How many visitors did the protected area have in 2008?	

2.10 Visitor	No visitor and tourism monitoring activities exists	1
Management	Visitor and tourism monitoring strategy exist, but is not being implemented (indicate why)	2
Visitor and Tourism Monitoring Activities	Visitor and tourism monitoring activities are being implemented. However, these activities are small in scale relative to need, and/or under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for management	3
	Visitor and tourism monitoring activities are being implemented. These activities are adequate in scale relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4

Section 3: Is there stakeholder participation? Are there sufficient stakeholder benefits?

3.1 Stakeholder No communication strategies exist between protected area staff and Involvement local stakeholders		1
	Communication strategies exist, but are not being implemented	2
Communication Activities	Communication strategies are being implemented. However, these activities are small in scale relative to need, and/or under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for mgmt	3
	Communication strategies are being implemented. These activities are adequate in scale relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4

Are communication strategies with communities effective?	Yes	Maybe Yes	Maybe No	No
What communication strategies have been used in 2008 / 2009?				

3.2 Stakeholder Involvement	Stakeholder groups are not identified, and there is only a limited working relationship with < 25% of stakeholder groups	1
	Stakeholder groups are identified, and a limited working relationship	r
Stakeholder	has been established with 25 - 50% of stakeholder groups	Z
Engagement	Stakeholder groups s are identified, and a limited working relationship has been established with over 50 % of stakeholder groups	3
	Stakeholder groups are identified, and a limited working relationship has been established with 100% of stakeholder groups	4

3.3 Stakeholder	No education activities exist for this protected area	1
Involvement	An education strategy exists, but is not being implemented (indicate why)	2
Educational Activities	Education activities are being implemented. However, these activities are small in scale relative to need, and/or under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for management	3
	Education strategies are being implemented. These activities are adequate in scale relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4

Are educational strategies effective?	Yes	Maybe Yes	Maybe No	No
What education strategies have been used in 2008 / 2009?				

3.4 Stakeholder Involvement	Local stakeholders and communities have been provided little or no information about the protected area, its ecological and cultural resources, related threats and impacts of resource use within pa	1
Dissemination of Knowledge and Information	A few local stakeholders and communities have been provided with information about the protected area and its ecological and cultural resources, related threats and impacts of resource use within pa, but most communities and stakeholders have only vague knowledge or understanding of this information	2
	Some local stakeholders and communities have been provided with information about the protected area and its ecological and cultural resources, related threats and impacts of resource use within pa, but most communities and stakeholders have only a partial understanding of this information	3
	Local stakeholders and communities have been provided extensive information about the protected area and its ecological and cultural resources, related threats and impacts of resource use within pa	4

Are information dissemination strategies effective?	Yes	Maybe Yes	Maybe No	No
What information dissemination strategies have been used in 2008 / 20	09?			

3.5 Stakeholder	Local stakeholders and communities do not participate in management	1
Participation	ion Local stakeholders and communities are consulted about planning issues	
Level of	Local stakeholders and communities participate in planning and managing the protected area	3
Participation in Management	Local stakeholders and communities participate fully in all aspects of planning and management	4

How many community participants have actively participated in conservation management activities in 2008 / 2009?

What mechanisms have been used in 2008 / 2009 to involve community participants in conservation management activities?

3.6 Stakeholder Participation	Local actors are informed and consulted about decisions taken by protected area management	1
Local Actors Leading	Local actors participate in the discussion process on management and then define who will make the final decision	2
Protected Area Management	Local actors share responsibility for taking decisions and executing the in the protected area management process	3
	Local actors lead the protected area management process, designing their agendas, taking decisions, and executing them	4

3.7 Stakeholder	No volunteer strategies or activities exist	1
Participation	Volunteer strategies exist but are not implemented (indicate why)	2
	Volunteer activities are being implemented. However, these activities	
Volunteer Activities	are small in scale relative to need, and/or under-funded, and/or not	3
	being evaluated, and therefore are not sufficient for management	
	Volunteer activities are being implemented. These activities are	
	adequate in scale relative to demand, adequately funded, regularly	4
	evaluated, and sufficient for management	

How many local volunteers participated in activities in 2008/2009?	
How many international volunteers participated in activities in 2008/2009?	

3.8 Stakeholder Participation	Local stakeholders have no functional capacity that would enable them to participate effectively in the management of the protected area	1
Strength of Social Capital	Few local stakeholders have a limited functional capacity that would enable them to participate effectively in the management of the protected area. They can provide input, but no assume any management role	2
	Many local stakeholders have substantial functional capacity that would enable them to participate effectively in the management of the protected area. They can assume many management roles, but not be able to manage the site	3
	Local stakeholders have adequate functional capacity that would enable them to participate effectively in the management of the protected area. They can assume most management roles, and manage the site	4

3.9 Stakeholder	No capacity building plan or initiatives exist	1
Participation	A capacity building strategy exists but is not being implemented (indicate why)	2
Capacity Building	Capacity building activities are being implemented. However, these activities are small in scale relative to need, and/or under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for management	3
	Capacity building activities are being implemented. These activities are adequate in scale relative to demand, adequately funded, are being utilized in the target community, are regularly evaluated, and <i>sufficient</i> for management	4

What community capacity building activities were conducted in 2008/2	009?			
How many community participants were actively involved?				
Have capacity building strategies been effective?	Yes	Maybe Yes	Maybe No	No

3.10 Stakeholder	No socio-economic benefits strategy exist for the protected area	1	
Participation	A socio-economic benefits strategy exists but is not being	С	
	implemented (indicate why)	Z	
Socio-Economic	Socio-economic benefits programmes are being implemented.		
Benefits Programme	However, these programmes are small in scale relative to need,	2	
	and/or under-funded, and/or not being evaluated, and therefore are	5	
	not <i>sufficient</i> for management		
	Socio-economic benefits programmes are being implemented. These		
	activities are adequate in scale relative to demand, adequately	4	
	funded, regularly evaluated, and sufficient for management		

3.11 Benefits	Local communities and stakeholders receive little or no direct economic benefits	1
Extent of Local Economic Benefits	Local communities and stakeholders receive a few direct economic benefits from the protected area	2
	Local communities and stakeholders receive direct economic benefits	3
	Local communities and stakeholders receive significant direct economic benefits from the protected area	4

How many community members are employed full time in the mana, the protected area?	gemen	t of			
How many community members are employed part time in the mana the protected area?	gemen	t of			
How many families' primary income are directly associated with the presence and use of the protected area? (direct employment, employment in tourism industry, self employment as tour guides focused on pa etc.)		e nce rism			
Have socio-economic benefit strategies in the last 5 years been effective?	Yes	Mayl Yes	be S	Maybe No	No

3.12 Benefits	The sustainable use of the natural resources in the protected area produces <25% employment in the communities within the area	1	
Sustainable Use for	The sustainable use of the natural resources in the protected area	С	
Economic Benefit	produces 25 - 50% employment in the communities within the area	2	
(Where applicable)	The sustainable use of the natural resources in the protected area	Э	
	produces 50 - 75% employment in the communities within the area	5	
	The sustainable use of the natural resources in the protected area	4	
	produces 75 - 100% employment in the communities within the area	4	

3.13 Benefits	Management processes are not producing new jobs	1
Employment in	Strategies exist for generating job opportunities within stakeholder communities, but are not implemented	2
activities related to the protected area	Management processes are generating job opportunities within stakeholder communities, but without stability or diversification	3
	Management processes are generating job opportunities within stakeholder communities, with job stability and diversification	4

3.14 Benefits	Few local community members or stakeholders (less than 25%) recognize the goods and services the protected area provides them	1
Recognition of Protected Area Benefits	Many local community members or stakeholders (between 25% and 50%) recognize the goods and services the protected area provides them	2
	Most local community members or stakeholders (between 50% and 75%) recognize the goods and services the protected area provides them	3
	Many local community members or stakeholders (more than 75%) recognize the goods and services the protected area provides them	4

What percentage of stakeholders				
Have mechanisms for increasing recognition of protected area benefits been effective over the last 5 years?	Yes	Maybe Yes	Maybe No	No

Section 4: Are effective management processes in place?

4.1 Management	No management plan exists for the protected area	1
Planning	A management plan is in preparation but not approved and/or has been prepared without full stakeholder participation	2
Management Plan Implementation	An up-to-date management plan has been completed with full stakeholder participation. However, only some of its strategies and programmes are being implemented	3
	An up-to-date management plan has been completed with full stakeholder participation and is being fully implemented	4

Implementation of management plan programmes and sub programmes is effective?	Yes (100% of programmes being	Maybe Yes (75 - 100% of programmes being	Maybe No (25 - 75% of programmes being	No (<25% of programmes being
	implemented)	implemented)	implemented)	implemented)

4.2 Management Planning	No up-to-date annual operational plan exists or an existing plan is not being implemented	1
Annual Operational	An operational plan is being implemented, but without the basis of a management plan	2
Plan Implementation	An operational plan is being implemented in agreement with some of the activities established in the management plan	3
	An annual operational plan is being fully implemented in agreement with the management plan	4

4.3 Management	No regulation zoning has been established	1
Planning	Regulations and zoning have been established, but are not well designated and/or are not being implemented, and are not sufficient	2
Regulations and	for management	
Zoning	Well designed regulations and zoning have been established. However, these are not being implemented, and/or are thus not <i>sufficient</i> for management	3
	Well designed regulations and zoning have been established, are being fully implemented, and are fully <i>sufficient</i> for management	4

Does the protected area have a structured zoning system?	Yes	Maybe Yes	Maybe No	No
Do the zones have clear rules and regulations?	Yes	Maybe Yes	Maybe No	No
Is information on the zones readily available to stakeholders?	Yes	Maybe Yes	Maybe No	No
Do stakeholders respect the management zone regulations?	Yes	Maybe Yes	Maybe No	No

4.4 Management	Plans do not identify management resource needs	1
Planning	Plans do identify management resource needs, but are not based on management and operational plans objectives and/or a careful needs	2
Long-term	analysis. These plans are not <i>sufficient</i> for management	
Management Needs Identified	Plans do identify management resource needs, based on management and operational plans objectives and/or careful needs analyses. However, the identification is not up-to-date and/or comprehensive enough. These plans are not <i>sufficient</i> for management	3
	Plans provide an up-to-date and comprehensive identification of management resource needs. These are fully <i>sufficient</i> to guide management	4

What are the three most important long term management needs?		
1.		
2.		
3.		

4.5 Management	No programme monitoring and evaluation activities exist	1
Planning	A programme monitoring and evaluation strategy has been developed, but is not being implemented (indicate why)	2
Programme Monitoring and Evaluation	Programme monitoring and evaluation activities are being implemented. However, these activities are small in scale relative to need, and/or under-funded, and/or not itself being evaluated	3
	Programme monitoring and evaluation activities are being implemented. These activities are adequate in scale relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4

When was the last monitoring and evaluation activity conducted?		
How frequently are activities monitored and evaluated?		
Were stakeholders involved?	Y	N

4.6 Management	No Research Programme exists	1
Planning Research	Research activities are being implemented, but there is no structured Research Programme, and these activities are small in scale relative to need, and/or under-funded, and/or not being evaluated	2
Programme	A structured Research Programme exists, with some activities being implemented. However, these activities are small in scale relative to need, and/or under-funded, and/or being evaluated	3
	A structured Research Programme exists, with activities that are adequate in scale, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4
Section 5: Is effective governance in place?

F 1 C e u e m e m e m e m e m e m e m e m e m e m e m e m e m e m e m e m m e m m e m m e m m e m m m m m m m m m m	No objectives have been defined for the site	1
5.1 Governance	No objectives have been defined for the site	L
	Existing objectives are too vague and general, and are not sufficient	2
Protected Area	for planning and management	2
Objectives	Existing objectives are narrow in scope, out-of-date, and/or need	2
	revision to be sufficient for planning and management	5
	Existing objectives are adequate in scope, up-to-date, and sufficient	Л
	for planning and management	4

What are the primary objectives for pa management?	Is management achieving these objectives?		ving	
1.	Yes	Maybe Yes	Maybe No	No
2.	Yes	Maybe Yes	Maybe No	No
3.	Yes	Maybe Yes	Maybe No	No
4.	Yes	Maybe Yes	Maybe No	No
5.	Yes	Maybe Yes	Maybe No	No

5.2 Governance	Mandates are not formally clarified, and potential for conflict in management exists	1
Co-management Arrangements	Mandates have been stated, but no formal agreement exists to guide management	2
	Mandates are established in a formal agreement, but the agreement needs strengthening, or revised to be consistent with the current management plan	3
	Mandates are established in an up-to-date and adequate formal agreement	4

5.3 Governance	Protected area management has little or no authority over its administration decisions	1
Administrative Autonomy	Protected area management must consult frequently with the central NGO office or line ministry (agency authority) concerning its administration decisions	2
	Protected area management has some authority over its administrative and technical affairs, but must sometimes consult with the central NGO office or line ministry (agency authority) concerning its administration decisions	3
	The protected area management has general authority over its administrative and technical affairs	4

Does an Advisory Committee exist?	Y	N
Does the Advisory Committee play an active part in management decisions?	Y	Ν

5.4 Operating	Written Advisory Committee operating procedures do not exist	1
Procedures	Advisory Committee operating procedures exist. However, these	
	procedures are out-of-date and/or substantially inadequate for	2
Advisory Committee	efficient and effective meetings	
	Advisory Committee operating procedures exist. These procedures	
	are up-to-date and/or substantially adequate for efficient and	3
	effective meetings, but still have some key deficiencies	
	Advisory Committee operating procedures exist for the governing	
	body of the protected area organization. These procedures are up-to-	4
	date and adequate for board management	

Does a functional Board exist?	Y	N
Does the Board play an active part in management decisions?	Y	N

5.5 Operating Procedures	No written Board operating procedures exist for the governing body of the protected area	1
Board	Board operating procedures exist for the governing body of the protected area organization. However, these procedures are out-of-date and/or substantially inadequate for board management	2
	Board operating procedures exist for the governing body of the protected area organization. These procedures are up-to-date and/or substantially adequate for efficient and effective meetings, but have some key deficiencies	3
	Board operating procedures exist for the governing body of the protected area organization. These procedures are up-to-date and adequate for board management	4

5.6 Operating	The protected area management does not maintain ongoing	1
Procedures	communications with most related organisations	
	The protected area management maintains some communications	
Interorganizational	with most related organisations, but there is little common	2
Mechanism	understanding, partnership, or cooperation	
	The protected area management maintains some communications	
	with most important related organisations through a joint forum or	3
	other established mechanism to exchange information and opinions	
	The protected area management maintains regular communication	
	with all most important related organisations through established	Л
	mechanism to exchange information, co-operate on joint projects,	4
	and share in planning and/or decision making	

Management Structure How many people are working towards	Position (or equivalent)	Numbe r	Paid	Volunt ary	Full- time	Part- time
	Director					
management of the	Site Manager					
protected area, and in	Head Ranger					
what capacity?	Rangers					
	Biologist					
	Accountant					
	Education Officer					
	Community Liaison					
	Accountant					
	Accountant					
	Other:					

Section 6: Are the human resources available adequate for effective management?

Total

6.1 Human Resources	The site manager has less than a high school diploma and/or less than 3 years experience directly related to his or her management responsibilities	1
Site Manager Preparation	The site manager has at least a high school diploma and between 3 and 6 years of combined relevant post-secondary education and/or experience directly related to his or her management responsibilities	2
	The site manager has at least a high school diploma and between 6 and 9 years of combined relevant post-secondary education and/or experience directly related to his or her management responsibilities	3
	The site manager has at least a high school diploma and more than 9 years of combined relevant post-secondary education and/or experience directly related to his or her management responsibilities	4

6.2 Human Resources	The site manager is available and dedicated to management of the protected area for up to 25% of the time	1
Site Manager	The site manager is available and dedicated to management of the protected area for 50% of the time	2
Availability	The site manager is available and dedicated to management of the protected area for 75% of the time	3
	The site manager is available and dedicated to management of the protected area for 100% of the time	4

6.3 Human	Less than 25% of the necessary administrative workers are available	1	
Resources	for basic administration of the area	-	
Administrative Staff	Between 25% and 50% of the necessary administrative workers are available for basic administration of the area	2	
Availability	Between 50% and 75% of the necessary administrative workers are available for basic administration of the area	3	
	Between 75% and 100% of the necessary administrative workers are available for basic administration of the area	4	

6.4 Human Resources	Less than 25% of the necessary technical, scientific, and professional workers are available for the area, and most technical, scientific, and professional functions cannot be carried out	1
Technical, Scientific and Professional Staff Availability	Between 25% and 50% of the necessary technical, scientific, and professional workers are available, but many technical, scientific, and professional functions as defined in the management plan cannot be carried out because of small staff size	2
	Between 50% and 75% of the necessary technical, scientific, and professional workers are available, but key technical, scientific, and professional functions as defined in the management plan cannot be carried out because of small staff size	3
	Between 75% and 100% of the necessary technical, scientific, and professional workers are available, and most technical, scientific, and professional functions as defined in the management plan can be carried out	4

6.5 Human Resources	Less than 25% of the necessary operations workers are available to carry out assigned operational work as defined by the management plan	1
Operations Staff Availability	Between 25% and 50% of the necessary operations workers are available to carry out assigned operational work as defined by the management plan and many operational functions cannot be carried out	2
	Between 50% and 75% of the necessary operations workers are available to carry out assigned operational work as defined by the management plan, but key operational functions cannot be carried out	3
	Between 75% and 100% of the necessary operations workers are available to carry out all assigned operational work as defined by the management plan, and most key operational functions can be carried out	4

How many management / operation staff are generally on-site?				
Do visitors encounter management / operation staff during visits to the	ne pa?	Y		Ν
Is there a high level of staff satisfaction with their work conditions?	Yes	Maybe Yes	Mayb No	e No

6.6 Human	No human resource surveys have been conducted	1
Resources	Human resource surveys have been planned, but have not been conducted and analyzed (indicate why)	2
Human Resource Surveys	Human resource surveys have been conducted. However, these are very limited in scope and not fully <i>sufficient</i> for management	3
	Human resource surveys have been conducted. These surveys are <i>sufficient</i> for management	4

6.7 Human	No training and development activities or strategies exist	1
Resources	Training and development strategies exist, but are not being implemented (indicate why)	2
Training and Development	Training and development strategies are being implemented. However, these activities are small in scale relative to need, and/or under-funded, and/or not being evaluated, and therefore are not <i>sufficient</i> for management	3
	Training and development strategies are being implemented. These activities are adequate in scale relative to demand, adequately funded, regularly evaluated, and <i>sufficient</i> for management	4

What were the last three staff training opportunities?	Did these training opportunities achieve their objectives?		their	
1.	Yes	Maybe Yes	Maybe No	No
2.	Yes	Maybe Yes	Maybe No	No
3.	Yes	Maybe Yes	Maybe No	No

Section 7: Are financial and capital management adequate for effective management	Section 7: Ar	e financial an	d capital man	agement adeq	uate for effectiv	e management?
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7.1 Funding and	The protected area has no funding of its own	1
Infrastructure	The protected area has funding that covers less than half (<50%) of its	2
	planned capital and operating costs	2
Funding Adequacy	The protected area has funding that covers more than 75%, but not all, of	Э
	its planned capital and operating costs	5
	The protected area has funding that covers all (100%) of its planned	Λ
	capital and operating costs	4

7.2 Funding and Infrastructure	No long term funding plan or mechanisms are in place, no financial sustainability mechanisms is in operation, and no funds are being raised	1
Long Term Funding	No long term funding plan, but funding mechanisms are in operation and some minimal funding is being raised, but funding is insufficient	2
Plan	Funding plans and mechanisms are in place, but income generation is not adequate for major needs, and income is sufficient for short term	3
	A long term funding plan exists, diversified funding mechanisms are operational, and income is generally adequate for major needs and sufficient for the long term	4

What income was received from entrance fees for 2008?			
List grant income for 2008 (individual pa information will be kept confidential)	Total value of grant	Period of grant	Income for 2008
From Belize-based Grant-giving Agencies			
1.			
2.			
3.			
From International Grant-giving Agencies	Total value of grant	Period of grant	Income for 2008
1.			
2.			
3.			
Other funding mechanisms			

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7.3 Funding and Infrastructure	No standard operating procedures have been established for financial management	1
Financial	Standard operating procedures have been established, but these do not conform to standards	2
Management	Standard operating procedures exist and conform to standards, but these procedures are not fully implemented throughout the organization	3
	Standard operating procedures exist and conform to standards, and are fully implemented throughout the organization	4

Is accounting effective throughout the organization?	Yes	Maybe Yes	Maybe No	No
Are annual account summaries produced in an Annual Report?		Y	N	

7.4 Funding and Infrastructure	Less than 25% of the planned infrastructure built or under construction	1
Infrastructure	Between 25% and 50% of the planned infrastructure built or under construction	2
Adequacy	Between 50% and 75% of the planned infrastructure built or under construction	3
	Between 75% and 100% of the planned infrastructure built or under construction	4

What Primary Infrastructure is on site? Visitor Facilities?
What are the priority infrastructure requirements for effective management?
1.
2.

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7.5 Finance and Infrastructure	Less than 25% of the required equipment is available and appropriate for its intended purpose	1
Equipment	Between 25% and 50% of the required equipment is available and appropriate for its intended purpose	2
Adequacy	Between 50% and 75% of the required equipment is available and appropriate for its intended purpose	3
	Between 75% and 100% of the required equipment is available and appropriate for its intended purpose	4

What are the priority equipment requirements for effective management?
1.
2.
3.

7.6 Finance and infrastructure	Staff have access to less than 25% of the area they need to visit in order to carry out their responsibilities	1
Internal Access	Staff have access to between 25% and 50% of the area they need to visit in order to carry out their responsibilities	2
Adequacy	Staff have access to between 50% and 75% of the area they need to visit in order to carry out their responsibilities	3
	Between 75% and 100% of the area they need to visit in order to carry out their responsibilities	4

What critical gaps in accessibility are there for effective management? How would these gaps be resolved?

1.	
2.	

7.7 Finance and	Less than 25% of the required signage exists	1
infrastructure	Between 25% and 50% of the required signage exists	2
	Between 50% and 75% of the required signage exists	3
Signage Adequacy	Between 75% and 100% of the required signage exists	4

7.8 Finance and infrastructure	Maintenance is provided for less than 25% of the infrastructure, equipment, and signs in the protected area	1
Maintenance	Maintenance is provided for between 25% and 50% of the infrastructure, equipment, and signs in the protected area	2
Adequacy	Maintenance is provided for between 50% and 75% of the infrastructure, equipment, and signs in the protected area	3
	Maintenance is provided for between 75% and 100% of the infrastructure, equipment, and signs in the protected area	4

Annex 5: Biodiversity Indicators: Marine Sector

Marine Indicators	V	Vhere no data	exists, please n	nark as n/a	
Physical Parameters (2008 Average)					
Temperature		Turbidity			
Salinity		Sedimentation			
Coral Indicators					
2008	Very Good	Good	Fair	Poor	Critical
Live Coral cover	≥ 40%	20 – 39.9%	10 - 19.9%	5 – 9.9%	< 5%
% recent coral mortality	0%	<2%	2-4%	4-8%	>8%
Coral disease prevalence	< 1	1.1 – 1.9	2.0 - 3.9	4.0-6.0	> 6
Highest % coral bleaching in 2008					
% Macroalgal cover					
Number of hard coral species					
3 dominant family groups					
Healthy Reef Fleshy macroalgal index	<10	10 - 19	20 - 39	40 - 59	≥60
Diadema abundance > 1.2		0.6 - 1.2/ m ²	0.3 - 0.6/ m ²	0.2 – 0.3/m ²	<0.2/m ²
Coral recruitment (#/ m ²)	≥ 10	5.0 - 9.9	3.0 – 4.9	2 – 2.9	< 2
Fish Indicators		·	-	·	
# Fish families		# Fish sp	ecies		
Fish Density (# individuals / 100m ²)		I			
Parrotfish size frequency					
Snapper size frequency					
Grouper size frequency					
Average Fish Biomass (g-100m ²)					
3 most dominant family groups					
Parrotfish fish biomass (g-100m ²)		>4650.01 g/100m ²	1250.01- 4650 g/100m ²	1-1250 g/100m ²	
Commercial fish biomass (g-100m ²)	≥2800	2100 - 2799	1400 - 2099	700 - 1399	<700
Average density of lobster (2008)				`	
Average density of conch (2008)					

Indicators within the Protected Area							
Column A Please enter :	Α	Species	Seen in 2009 (√)	VG	G	F	Р
✓ Present (stable /		Mangrove					
increasing)		Seagrass					
↓ Present (decreasing)		Littoral Forest					
x Absent (if present		West Indian Manatee					
historically)		Hawksbill Turtle					
nresent)		Loggerhead Turtle					
presenty		Green Turtle					
Rating		American Crocodile					
VG: Very Good. Doesn't need		Morelet's Crocodile					
human intervention		Nassau Grouper					
G: Good: Populations		Black Grouper					
reduced, but should recover		Goliath Grouper					
with limited human		Whale Shark					
F: Fair: Populations will		Sharks (general)					
decline if there is no human		Rainbow Parrotfish					
intervention		Queen Triggerfish					
P: Poor: Populations are in		Hogfish					
danger of disappearing from		Cubera Snapper					
the area, even with human		Mutton Snapper					
Intervention		Yellow tail Snapper					
		Spiny Lobster					
		Queen Conch					
		Lionfish					
		Permit					
		Bonefish					
		Snook					
		Tarpon					
		Barracuda					
		Migratory Birds					
		White crowned pigeon					
		Island Leaf-toed Gecko					
	041	Tokay Gecko					
	Uther						

Annex Six: Marine Species of International Concern (validated – see text)

Indicator Species of International Concern		Number pas with data (of 13)	Overall Rating	Overall Rating (%)	General Trend*	Level of Risk
Critically Endangered	b					
Goliath Grouper	Epinephelus itajara	11	1.50	37.5%	Decreasing (5) /Stable(3) ³⁵	Very High (0.87)
Hawksbill Turtle	Eretmochelys imbricata	12	1.50*	37.5%	Stable (6)/Decreasing (1)	High (1.36)
Endangered						
Loggerhead Turtle	Caretta caretta	11	1.50*	37.5%	Stable (4)/ Decreasing (1)	High (1.30)
Green Turtle	Chelonia mydas	9	1.50*	37.5%	Stable (4) /Decreasing (2)	High (1.17)
Nassau Grouper	Epinephelus striatus	9	2.11	52.8%	Stable (5)/Decreasing (2)	High (1.82)
Vulnerable						
Queen Triggerfish	Balistes vetula	9	2.50	62.5%	Stable (3) /Decreasing (3)	High (2.00)
West Indian Manatee	Trichechus manatus	6	2.80	75.0%	Stable (6)	Medium (2.80)
Hogfish	Lachnolaimus maximus	9	2.22	55.5%	Decreasing (7) /Stable (1)	High (1.34)
Mutton Snapper	Lutjanus analis	10	2.78	69.4%	Decreasing (4)/ Stable(4)	Medium (2.28)
Cubera Snapper	Lutjanus cyanopterus	7	3.00	75.0%	Stable (5)/Decreasing (1)	Medium (2.17)
Whale Shark	Rhincodon typus	3	3.00	75.0%	Stable (3)	Medium (3.00)
Average			2.22	55.5%		High (1.83)

Status Score: Poor ≤1.00; Fair >1.00 – 2.00; Good >2.00 – 3.00; Very Good >3.00 Risk score: Very High ≤1.00; High >1.00 – 2.00; Medium >2.00 – 3.00; Low >3.00

³⁵ As rated by IUCN Redlist, 2008

Indicator Species of National Concern		Number pas with data (of 14)	Overall Rating	Overall Rating (%)	General Trend	Mean Trend Score	Level of Risk
Yellow tail Snapper	Ocyurus chrysurus	8	2.88	71.9%	Stable (6)/ Decreasing (2)	-0.25	Medium (2.63)
Spiny Lobster	Panulirus argus	10	2.00	50.0%	Decreasing (8)	-1.00	Very High (1.00)
Queen Conch	Strombus gigas	8	2.25	56.3%	Stable (1)/ Decreasing (6)	-0.86	High (1.39)
Permit	Trachinotus falcatus	6	2.71	67.9%	Stable (5)/ Decreasing (1)	-0.17	Medium (2.54)
Bonefish	Albula vulpes	7	3.14	78.6%	Stable (5)/ Decreasing (1)	-0.17	Medium (2.97)
Snook	Centropomus undecimalis	2	2.00	50.0%	Stable (2)	0.00	Medium (3.00)
Tarpon	Megalops atlanticus	6	3.00	75.0%	Stable (5)	0.00	Medium (3.00)
Average			2.57	64.2%			2.22

Status Score: Poor ≤1.00; Fair >1.00 – 2.00; Good >2.00 – 3.00; Very Good >3.00 Risk score: Very High ≤1.00; High >1.00 – 2.00; Medium >2.00 – 3.00; Low >3.00

Annex Seven: Summary of Protected Area Designation, Goals and Scores

Protected Area	Legislated Goals	IUCN category	Primary Protected Area Vision /	Bio	NI
			Goal	Score	Score
National Parks					
Aguas Turbias	For the protection and preservation of natural and scenic values of national significance for the benefit and enjoyment of the general public	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	To maintain trans-boundary connectivity within the Maya Forest of Calakmul-Rio Bravo.		1.00
Bacalar Chico		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.	To provide protection for the physical and biological resources of north Ambergris Caye, which includes a wide range of inter- dependent habitats in a region targeted for extensive further development.	2.00	1.61
Billy Barquedier		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	Toprotectwatersheds,biodiversity,Andforthepotentialforgenerating tourism revenue for thelocal economy.		2.06

Chiquibul		designation of the area and (c) provide a	A core area of protection of	2.25	2.87
		foundation for spiritual scientific	biological diversity within the		
		educational, recreational and visitor	Chiquibul Forest and is recognized		
		opportunities all of which must be	within the Greater Chiquibul/Maya		
		environmentally and culturally	Mountains Region for its intrinsic		
		compatible.	natural and cultural values, whilst		
			contributing to national		
			development regional security and		
			cooperation and enhancing and		
			maintaining its ecological integrity		
Five Blues Lake			To protect the natural resources	2 70	1 48
			and biodiversity for future	2.70	1.10
			generations and provide socio-		
			economic benefits for St		
			Margaret's village		
Gra Gra Lagoon	-		To maintain its value in terms of	1 1 4	2 71
			conserving biodiversity providing	1.14	2.71
			critical ecological services and		
			contributing to the local economy		
			and social well-being through		
			recreational use		
Guanacasto	-		To promoto understanding of		2 5 2
Guariacaste			noture and the environment in		2.52
			order to provide recreation		
			opportunities and foster respect		
			for the park and its personnel		
			whilst maintaining the hielogical		
			integrity of the area		
Hanay Camp	4		To provent further land allocations	2.20	1 20
попеу Сатр			and do reconnection and to attend	2.38	1.28
			and de-reservation, and to attempt		
			restoration of the reportedly		
			severely impacted biodiversity of		
			the lagoons.	1	

Laughing Bird Caye	To protect the unique biodiversity	3.17	2.79
	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		
	future generations.		
Mayflower Bocawina	To protect the natural habitat of		1.76
	the area and the archaeological		
	site located within it, as well as		
	providing opportunities for tourism		
	and recreation-related activities.		
Monkey Bay	To compliment the Monkey Bay	2.56	1.24
	Wildlife Sanctuary in creating a		
	wildland corridor across the Sibun		
	Watershed		
Noj Kaax H'Men Elijio	For the Preservation and	2.20	2.66
Panti	Conservation of the Natural		
	Resources, Cultural patrimony and		
	community Development		
Payne's Creek	The maintenance of biodiversity		3.09
	within the Payne's Creek National		
	Park.		
Peccary Hills			2.61
Rio Blanco	Was requested by Santa Elena and		2.16
	Santa Cruz to protect a unique		
	waterfall and popular swimming		
	spot		
Sarstoon-Temash	To safeguard the ecological	3.22	3.48
	integrity of the Sarstoon-Temash		
	region and employ its resources in		
	an environmentally sound manner		
	for economic, social and spiritual		

			well being of its indigenous people		
St. Herman's Blue Hole			To conserve natural and cultural		2.75
			resources for ecosystem values,		
			education, and recreation through		
			collaboration with relevant		
			stakeholders.		
Natural Monuments					
Actun Tunichil Muknal	For the protection and	Ia: Protected area managed	To protect and preserve a natural		2.48
	preservation of national features	mainly for science	geological feature and allow for		
	of national significance		visitation		
Blue Hole		III: Protected area managed	To protect and preserve natural	1.14	3.34
		mainly for conservation of	resources and nationally		
		specific natural features	significant natural features of		
Half Moon Caye		II: Protected area managed	special interest or unique	1.54	3.35
		mainly for ecosystem	characteristics to provide		
		protection and recreation.	opportunities for interpretation,		
			education, research and public		
			appreciation for the benefit of		
			current and future generations,		
			within a functional conservation		
			area.		
Thousand Foot Falls		III: Protected area managed	To protect the aesthetic values		2.82
Victoria Peak		mainly for conservation of	To maintain biodiversity, cultural		3.13
		specific natural features	resources and watershed areas		
			within a functional conservation		
			area, as an integral part of the		
			National Protected Areas System		
Nature Reserve					
Bladen	For the protection of biological	Ia: Protected area managed	For the protection of nature be it	2.64	2.92
	communities or species, and the	mainly for science	biological communities or species		
	maintenance of natural processes		and to maintain natural processes		
	in an undisturbed state		in an undisturbed state in order to		
	in an unaistarbea state		have an ecologically representative		

			example of the natural environment available for scientific		
			the maintenance of genetic		
			resources		
Burdon Canal		Ia:Protected area managed mainly for science			1.32
Tapir Mountain		II: Protected area managed mainly for ecosystem protection and recreation.	To retain 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		2.34
Wildlife Sanctuaries	l				
Aguacaliente	For the protection of nationally significant species, biotic	IV: Protected area managed mainly for conservation through management	To safeguard the future of manatees by reducing threats to their health and their habitat.	1.60	2.26
Cockscomb Basin		intervention	To maintain biodiversity, cultural resources and watershed areas within a functional conservation area, as an integral part of the National Protected Areas System		3.13
Corozal Bay			To protect the significantly important population of West Indian manatee, as part of a bi- national initiative	1.54	2.24
Crooked Tree			To maintain biological integrity and traditional cultural resources within a functional conservation area, as an as an effective RAMSAR site, and as an integral part of the National Protected Areas System	2.25	2.88

Gales Point	_		To protect and maintain the natural resources of the Gales Point Wildlife Sanctuary as an integral part of the National Protected Areas System To protect biodiversity and	2.90	1.91
Spanish Creek			abundant flora and fauna in and around the protected area, and to generate income within the community		
Swallow Caye			To safeguard the future of manatees by reducing threats to their health and their habitat.		
Marine Reserve					
Bacalar Chico	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	IV: Protected area managed mainly for conservation through management intervention	To provide protection to the physical and biological resources of north Ambergris Caye, which includes a wide range of inter- dependent habitats, in a region targeted for extensive further development.	2.66	
Caye Caulker	regeneration of aquatic life in areas where such life has been depleted	VI: Protected area managed mainly for the sustainable use of natural ecosystems	To protect marine and island wildlife and habitats at risk at Caye Caulker	2.50	
Gladden Spit and Silk Cayes		IV: Protected area managed mainly for conservation through management intervention	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	
Glover's Reef			To provide protection for the physical and biological resources of Glover's Reef, in order to maintain and sustain these resources for the	2.60	

Hol Chan II: Protected area managed mainly for ecosystem protection and recreation. Protection of recreational (especially Hol Chan Channel and Shark Ray Alley) and fishing resources Port Honduras IV: Protected area managed mainly for conservation through management intervention To protect the physical and 2.36 2.36 Sapodilla Caye South Water Caye To protect the southern terminus of the world Heritage Site designation 2.79 To protect the southern terminus of the world Heritage Site designation South Water Caye Community Baboon To protect the average of the reserve of the natural resources of South Water Caye in perpetuity. To protect the abilities for the black for the black for the black for the southern terminus of the natural resources of South Water Caye in perpetuity. 2.40 2.19 Private Protected Areas To protect the abilities for the black for and the Golden Stream Watershed from alternative large-scale agriculture. 1.58 3.12 Monkey Bay Wildlife Sanctuary To serve as a model of private land stewardship while conserving and provecting land and biodiversity in ways that acrure heenefits to land 1.90 2.58		benefit of current and future		
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protecting land and biodiversity in ways that accrue benefits to land	Sanctuary	stewardship, while, conserving, and	1.90	2.30
ways that accrue benefits to land	Salictualy	protecting land and hiediversity in		
		protecting land and biodiversity in		
owners and local communities		ways that accide benefits to failu		
Rio Bravo Conservation To conservation	Rio Bravo Conservation		3 56	2 1 0
and Management Area	and Management Area	Belize and promote the sustainable	3.50	5.10

		use of Forest reserves, and	to	
		demonstrate that conservation	and	
		development can be compatible	e	
Runaway Creek Nature		To protect the flora and faun	a of 2.73	1.97
Preserve		Central Belize and form part of	the	
		biological corridor between	the	
		Selva Maya and Maya Mount	ains	
		Massif		
Shipstern Nature		For the protection	and 2.33	2.46
Reserve		conservation of the Yucatan	dry	
		forest ecosystem, saline lago	ons,	
		mangroves, wetlands and Yuca	atan	
		endemic species		
TIDE Private Protected		Conservation of biodiversity	and 2.67	2.35
Lands		sustainable use of nat	ural	
		resources in Southern Belize		
Bird Sanctuaries				-
Monkey Caye	For the protection of nationally			
Little Guana Caye	important bird nesting colonies			
Los Salones				
Bird Caye				
Un-Named				
Man of War				
Dubloon Bank				