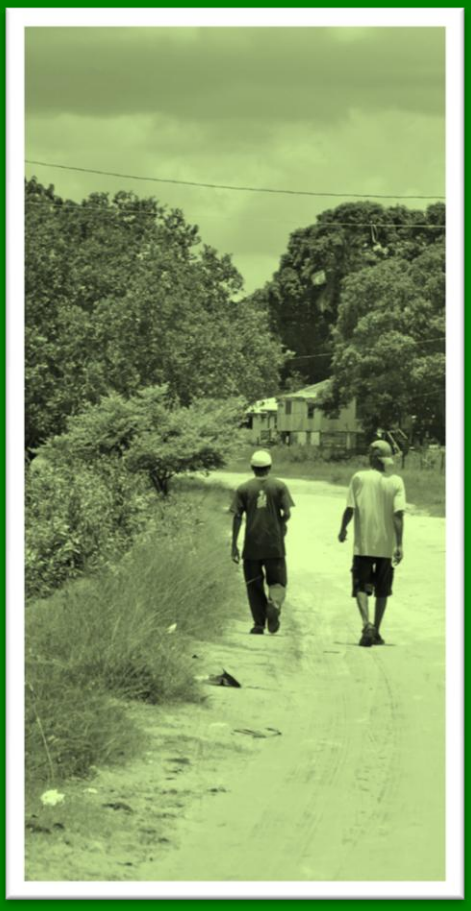
Management Plan for the

Community Baboon Sanctuary

Linking Conservation and Sustainable Development



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Prepared by:

Dr. Jon Lyon
Department of Biology
Merrimack College
North Andover, MA 01845 USA

Merrimack COLLEGE

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Executive Summary

The Uniqueness of the Community Baboon Sanctuary

The Community Baboon Sanctuary (CBS) was established in 1985 and is located on the northern coastal plain of Belize. It is geographically centered on the Village of Bermudian Landing in the lower Belize River Valley (Longitude 17° 55' 65"N; Latitude: -88° 53' 07" W). The CBS is an **IUCN Category IV** protected area but it is a Community Conserved Area where individual landowner participation is completely voluntary and based on a pledge system. The present membership is some 170 landholders and includes members of seven area villages, Flowers Bank, Scotland Half-Moon, Isabella Bank, St. Paul's Bank, Willows Bank, Double Head Cabbage, and Bermudian Landing. The CBS covers some 14,800 acres.

The Community Baboon Sanctuary (CBS) is unlike any other protected area or wildlife sanctuary in Belize. The nature and functioning of the CBS is completely embedded within the seven Belize River Valley communities that comprise it and it is inextricably linked to the Kriol culture and history of the region. The sanctuary nature of the CBS exists because of the long-held cultural appreciation for the black howler monkeys (*Alouatta pigra*) by the people that co-inhabit the region. Villagers in the Belize River Valley have very rarely ever hunted howlers for food and rarely engaged in capturing them for pets or the pet trade. In fact, there is a deep-seated appreciation and enjoyment of the howlers and they have become part of the fabric of the rural lifestyle along the Belize River. Thus, humans and black howlers have been co-existed in the Belize River Valley for generations. The formal establishment of the CBS in 1985 reflected a formal and external acknowledgement of the reality that a natural sanctuary for the howlers already existed.

The CBS has stood for 28 years as an example of community-based conservation that helped to define a whole new category of protected area in Belize and globally. More importantly, the CBS has had a catalytic effect on rural communities in Belize, Belizean NGOs and the Government of Belize. This catalytic impact led to a wave of community-based conservation and ecotourism projects across Belize in the 1980s, 1990s and 2000s and spawned the development of co-management agreements nationwide. In this way, the CBS is an important conservation presence in Belize and those associated with it have amassed up to 28 years of experience in working through the complicated dynamics involved in managing such a complex ecological and socio-economic landscape. Thus, the CBS is an important part of the conservation and sustainable development community in Belize and has earned a strong voice in the national conservation discussion.

Since the inception of the CBS, howler populations have increased somewhere in the range of 460 to 590% and the total population of howlers in the CBS is some 4,500 – 5,500 monkeys. This has clearly been a huge conservation success for the CBS and means that the CBS now maintains a viable population of howler monkeys that is somewhere near its carrying capacity. Management should thus shift in focus to maintaining a healthy and genetically diverse population rather than growing a population.

CBS Management

CBS management has gone through a large number of iterations and transitions over the past 28 years and has endured turnovers in staff, lean financial times, periods of internal conflict and external strains. CBS management has also been party to dramatic increases in howler populations, at times, a thriving eco-cultural tourism programme and initiation and management of a host of community development projects, totaling over $900,000 Belize dollars. As of 1998, the CBS Women's Conservation Group

(CBSWCG), a registered NGO, has been the sole management authority of the CBS. The CBSWCG has Articles of Association that dictate its structure and function. The governance of the CBSWCG consists of an Advisory Council and an elected seven member women executive committee representing the seven villages. Their vision is to:

> *Be a leading grass roots world-class model promoting Belize's natural resources while preserving prime habitat for the movement of wildlife. The CBS will be the leading private community-based reserve working hand in hand with its members for improved economic conditions, social well-being, and will play a major role in providing alternative livelihood through conservation efforts.*

Their mission is:

> *To promote cooperation with governmental and non-governmental agencies to conserve the CBS natural resources, foster sustainable eco-cultural tourism, assist in the development of cottage industries and enterprises, while at the same time recognizing and encouraging the substantial role of women in the conservation, family and economic sector.*

Since its inception in 1998, the CBSWCG has changed from being based solely on black howler monkey protection to include the five major management focal points: Conservation, Scientific Research, Education, Eco-Cultural Tourism and Community Development. While laudable, the complex nature of this diverse mission has meant that there has not always been funding, time and capacity to achieve broad success in all areas consistently. In addition, large turnover is staffing has hobbled evaluation and assessment efforts and led to less than optimal communication between CBS management and landholders/ residents. That said the CBS is the longest lasting conservation and economic entity in the Belize River Valley.

The Purpose and Scope of the Management Plan

This is the first comprehensive management plan to be developed for the CBS since the CBSWCG began managing the CBS in 1998. The plan has been prepared to fit within the framework required by the *National Protected Area Policy and System Plan*. The management plan also recognizes the unique nature of the CBS as a Community Conserved Area (CCA) and its unique governance and management structures.

In 2013, the CBS and the CBSWCG are in the midst of a transition and face the task of advancing all operations and management to meet the socio-economic, political and environmental challenges of 21st century Belize; challenges that include a dynamic and increasingly connected conservation community, an evolving and sophisticated tourism industry and a renewed push towards sustainable development planning.

Belize has changed a great deal since the inception of the Sanctuary in 1985 and even since the CBSWCG assumed management in 1998. While the CBS has made dramatic positive steps forward and gained enormous experience in the realities of managing a complex Community Conserved Area, the CBS needs to revise its management structure, enhance its management capacity, embrace regional and national conservation initiatives, improve its internal and external communication, reach out to a new generation of citizens of the Belize River Valley and grow both the depth and scope of its management.

Given the unique circumstance of the CBS as a CCA, and the fact that it is embedded in the geographical and socio-economic fabric of the villages that comprise it, the current management plan takes a holistic approach to management; the management plan builds on the 2011 CBS Strategic Plan and

encompasses the conservation, eco-cultural tourism, community development, scientific research and educational components of the CBS mission. The current plan also has been formulated within the context of a 5-year horizon.

This plan has been vetted through the CBSWCG and that entity is responsible for distributing the completed plan to the relevant NGO and GOB agencies.

Conservation Targets

Management of CBS lands goes well beyond just managing for howler habitat. The increased pressures from pastures, home development, other agricultural and economic activity and tourism interests mean that a broader management plan is needed that extends beyond even those who own/lease properties with howlers on them (i.e., riparian forests). A broader regional and comprehensive plan is necessary to both protect the long-term integrity of the howler habitat and to incorporate broader land use changes occurring in the region that may only indirectly impact howlers and other wildlife and flora. The CBS management plan identifies five key conservation targets.

Protection and Maintenance of a Viable Population of Black Howler Monkeys
This target has been at the core of the CBS mission from its inception in 1985 to the present. The black howler monkey species (*Alouatta pigra*) is listed as endangered by the IUCN and vulnerable in Belize. It has been the basis of habitat management and conservation planning, it has spawned a diverse research programme, it has drawn international attention to the region and it is the basis of nature tourism in the area.

Maintaining the Interconnected Corridor Integrity of CBS Lands
This target is focused on the structure, connectivity and coverage of the forested regions within the CBS in relation to their functioning as a biological corridor. Fragmentation of riparian forests remains a constant threat and this not only threatens habitat on individual landholdings, but also the connectivity between landholdings across the landscape.

Sustainable Use of Fish, Reptile and Wildlife Resources in the Region
There continues to be pressure on existing wild fish, reptile and wildlife populations in the lower Belize River Valley. Fishing pressure has increased along the Belize River and especially in the Mussel Creek drainage. In addition, hunting pressure on the Central American river turtle or hicatee (*Dermatemys mawii*), Morelet's crocodile (*Crocodylus moreletii*) and green iguana (*Iguana iguana*) have also increased dramatically in recent years. There is a need to address these conservation threats with a comprehensive strategy.

Protection of Lands Linked to the Northern Biological Corridors in Belize
As a community conserved protected area, the CBS should not be viewed in isolation. It is geographically linked to the Northern Biological Corridor system in Belize and thus needs to incorporate this in its management.

Development of a Comprehensive Pledge System to Achieve Conservation Targets
The voluntary pledge system has been the core management approach since the CBS was initiated. It is a system that respects individual landholder rights while simultaneously providing management and conservation guidance.

Threats to Biodiversity

The following threats to biodiversity in the CBS were identified by stakeholders in the CBS and proposed management actions are noted.

Deforestation

Deforestation, albeit at a small-scale on most individual landholdings, is widespread in the CBS effecting >50% of landholdings. Severity has been substantial in the past two decades but is not a crisis at this time and it can be reversed. Given that the management unit is the individual landholding, severity is not consistent across the CBS; there are some areas under extreme pressure and others virtually under protection.

Action: Re-pledging CBS landowners and updating and creating new property maps and conservation plans; Regular (every 1-2 years) monitoring of new management plans.

Forest and Habitat Fragmentation

Linked to the impacts of deforestation is the threat of excessive forest and habitat fragmentation.

Action: Re-pledging CBS landowners and updating and creating new property maps and conservation plans; Regular (every 1-2 years) monitoring of new management plans.

Overexploitation of Fish, Reptile and Wildlife Species

Hunting for game has been part of life in the Belize River Valley for generations. In the past 5 years, there has been strong external fishing and hunting pressures on fish, reptiles and wildlife. In particular, there has overexploitation of fisheries in Mussel Creek as well as of hicatee and Morelet's crocodile. To a lesser extent, there has been pressure on the green iguana and various popular bush meat species. There is also a growing trend in the savanna areas to harvest parrots.

Action: Create an active Mussel Creek Task Force that includes local residents of Scotland Half Moon adjacent to Mussel Creek, CBS and the Forestry and Fisheries Departments; also begin preparing plans immediately to explore creating Mussel Creek as an IUCN Category VI Protected Area.

Hurricanes, Tropical Storms and Flooding

The vulnerability to natural hazards in the lower Belize River Valley is due the large majority of its population (households) and economic activity (mainly shops, agriculture and tourism) being adjacent to an exposed low lying coastal zone, as well as being on the flood-prone banks of the Belize River system.

Action: Maintaining as healthy and viable populations as possible of targeted species (e.g., black howler monkeys) so they will be more resilient to the impacts of storm events. However, areas that are prone to flooding should me mapped and any programmes and/or projects implemented in those areas need to take this into consideration prior to development.

Petroleum Exploration and Exploitation

While there is no immediate threat from petroleum development in or immediately adjacent to the CBS, petroleum exploration needs to be evaluated in terms of both immediate potential threats to current CBS landholdings, but also threats to the broader areas in the Belize River Valley that comprise the new broader, regional management zones being proposed for the CBS.

Action: Management actions need to be proactive rather than reactive. Some advanced planning needs to be conducted so the CBS knows how to respond to potential oil exploration

threats and needs to help guide and inform those efforts such that they are not encouraged if the threat is too great or modified such that there impact is minimalized.

Wildfire Threat

In the CBS, the protection of the individual landholder forests, milpas, pastures, fruit trees and other natural assets in inextricably linked to the protection of wildlife habitat. As such, promotion of a fire suppression and control programme is to the benefit of both local landholders and local wildlife.

Action: Developing village-based fire prevention and fire suppression programmes would benefit landowners, property, livestock and wildlife. Given the recent events of 2011, there is an opportunity to discuss managing milpa and pasture fires and having a proactive programme for fire suppression. This could be included in landowner management plans.

Free Ranging Cattle

Given the extent of free ranging cattle throughout all lands and forest types of the CBS, the impact of cattle is clearly much greater than 50% of the CBS area. Cattle herbivory impacts the regeneration of forest seedlings, increases soil disturbance and erosion, cattle are often competing for food sources with native herbivore species. In addition, cattle create manure management and water contamination issues. The impacts are chronic and widespread.

Action: *Re-visit the local policy of allowing free-range cattle; encourage penning of animals; fencing off critical areas to allow for regeneration (cattle exclusion zones)*

Lack of Sufficient Economic Activity in the Belize River Valley

Given that the CBS is comprised of individual landholdings, the lack of sufficient economic activity will potentially impact much greater than 50% of the CBS. The level of severity on biodiversity will be positively correlated to the severity of the economic situation in the Belize River Valley. There may be a measureable impact now on the density and distribution of wild game, fish and reptile species but the severity level is not critical.

Action: Enhance community development and eco-cultural tourism programmes; be more vigilant in working with landowners in updating management plans; create and maintain an updated database on all economic activities in and around the CBS.

Lack of Adequate Educational Opportunities in the Belize River Valley

One of the long-term challenges in the villages of the CBS and surrounding Belize River Valley is to provide the local children with quality basic schooling and adequate educational opportunities. These are highly important both for students in that it facilitates their employment in other sectors than small-scale agriculture and subsistence hunting and fishing and it provides them with capacities to become sustainable development pioneers in the Belize River Valley. This ties in directly with the education mission of the CBS.

Action: Partner with schools to develop a regional education plan; CBS financial and logistic support for existing school programmes and infrastructure; form national and international partnerships to garner resources, training and capacity building opportunities for teachers and school administrators.

Grant Writing and External Funding

Since assuming management of the CBS in 1998, the WCG has had an extraordinary record in grant writing and securing external funding. Over $900,000 Belize dollars has been secured, mainly through funding from PACT and UNDP/GEF. The 2011 Strategic Plan notes, however, that the financial constraints faced by the organization (CBS) for project development and management have been compounded by an over-reliance on external financial support. Thus new revenue streams are needed to help the CBS and the CBSWCG fully achieve this mission.

Re-Structuring of CBS Management

CBS Management reorganization is an important, overarching mechanism to better align the management of the CBS with the organizational mission and to improve accountability, transparency, efficiency and communication. The reorganization will also help clarify and improve governance and provide more opportunities for development and capacity building for the CBSWCG and CBS staff. This reorganization is being done to facilitate the institutional strengthening mandate in the Strategic Plan. Under that document, it states that this core objective will be achieved by implementing four major strategies: (1) Governance improvement, (2) Human resources development, (3) Membership, and (4) Financial sustainability. These strategies are embedded in the management re-structuring plan presented here, especially strategies (1) and (2).

One of the key components of this re-structuring is the formation of the new Executive Director position. The position will essentially be a conflation of the current Administrative Officer and Programme Coordinator positions. Given this change, the role of the CBSWCG will also change as will the role of the President of the CBSWCG.

Management Zones

Zoning is an important management tool for protected areas and this is also true of the CBS. Zoning in the CBS has more to do with expansion of the geographic zone of influence of the CBS rather than parsing apart the existing boundaries of the CBS. Management zones are useful so long as their delineation is done for good management reasons and that the zones reflect the conservation mission of the CBS.

Given these realities and concerns, six management zones are proposed for the CBS, each with its own specific management objectives. The CBS itself remains the core management zone and around which all other management activities revolve. The six proposed management zones are:

Zone A - The Community Baboon Sanctuary (15.6 mi^2) - This is the most significant zone for protection of the black howler monkey and its habitat. The individual landholding is the basic management unit and is the basis of the pledge system and conservation planning and management.

Zone B – Housing and Sustainable Development (5.1 mi^2) - This zone corresponds to the major roads that cut across the Belize River Valley. This zone has become the primary zone for housing, schools, recreation, shops and churches, especially as in the past two decades, many people have migrated from the river banks to the 'pine ridge' areas. In addition, most new houses are being constructed along or near these roads. As such, management of this zone is focused on controlling and limiting the environmental impact of this development while simultaneously

promoting sustainable development initiatives. In terms of howler habitat, many of these areas are peripheral to the riparian forests and provide low quality or no habitat.

Zone C – CBS Expansion into May Pen Village (4.2 mi^2) - The zone encompasses the riparian corridor downstream from the existing Sanctuary includes the village of May Pen. This is a small village that can be included in the CBS and extend the Sanctuary from Flowers Bank nearly to the Northern Highway. This area will also eventually include the road being constructed from the Northern Highway to Isabella Bank. This would be a proactive measure to establish the conservation principles of the CBS prior to housing and land use development that is inevitable along the new road.

Zone D – CBS Expansion to Labouring Creek (1.1 mi^2) - This zone includes the lands upstream from Big Falls/St. Paul's that extend up to the Labouring Creek Jaguar Corridor Wildlife Sanctuary (LCJCWS) and the Spanish Creek Wildlife Sanctuary. This is an important area of land that is linked to the northern wildlife corridor and closes a 'gap' in the corridor management matrix. This inclusion is also important in light of recent development impacts within the LCJCWS.

Zone E - Pine Ridge and Savanna Biological Corridor (90.8 mi^2) - This Zone is the largest by far and connects the CBS with the Crooked Tree Wildlife Sanctuary to the North and the Rio Bravo Conservation and Management Area to the west. This management zone will be created to help maintain the ecological functionality of critical wildlife corridors while encompassing community development projects. Management of this zone will require strategic partnerships with surrounding protected areas and other stakeholders.

Zone F – Mussel Creek Drainage (3.2 mi^2) - This zone includes the areas along the Mussel Creek drainage, including Mussel Creek, Cox Lagoon and Muckleheny Lagoon. It is proposed that this be established as an *IUCN Category VI Protected Area*. This is a protected area with sustainable use of natural resources that will conserve ecosystems and habitats, together with associated traditional natural resource management systems. Most of the area will remain in a natural condition but a proportion will be under sustainable natural resource management and where low-level, local fishing will be allowed. This will likely require a co-management agreement.

Limits of Acceptable Change

Given that it is not just visitor impacts that impact CBS lands but also landowner impacts, limits of acceptable change have to be separated into those two categories. Once acceptable limits are exceeded, reviews need to take place and specific management actions will need to be taken to address the threat(s).

Tourist Impacts – It is necessary to establish goals for tourism in any protected area, but especially a Community Conserved Area like the CBS as tourism is embedded within the community. All subsequent planning and actions need to follow from these established goals. Planning and actions include modifying/building infrastructure, developing tourist packages and setting goals on levels of weekly, monthly and yearly tourist visitations. Overall, tourism can change biophysical conditions, challenge social acceptability and require specific managerial responses when limits are exceeded.

Landowner Impacts – Given that the individual landholding is the basic management unit in the CBS, the nature, level and extent of landowner land use can have major impacts on meeting established conservation and community development goals. Thus, clear limits need to be established and be

effectively communicated with all landholders so they are aware of the limits and work to not exceed them within the voluntary management framework established in the CBS.

In developing limits of acceptable change for CBS landholders, the so-called 'Malawi Principles' for the ecosystem approach can inform the complexity of applying acceptable limits in a voluntary, working landscape with no core protected areas. The 12 principles are:

1. Management objectives are a matter of societal choice.
2. Management should be decentralized to the lowest appropriate level.
3. Ecosystem managers should consider the effects of their activities on adjacent and other ecosystems.
4. Recognizing potential gains from management there is a need to understand the ecosystem in an economic context, considering e.g., mitigating market distortions, aligning incentives to promote sustainable use, and internalizing costs and benefits.
5. A key feature of the ecosystem approach includes conservation of ecosystem structure and functioning.
6. Ecosystems must be managed within the limits to their functioning.
7. The ecosystem approach should be undertaken at the appropriate scale.
8. Recognizing the varying temporal scales and lag effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.
9. Management must recognize that change is inevitable.
10. The ecosystem approach should seek the appropriate balance between conservation and use of biodiversity.
11. The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
12. The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

Management Programmes, Objectives and Management Actions

Six key management programmes are proposed for the CBS and the objectives of those programmes are summarized below.

Natural Resource Management Programme

Overall Objective: *Maintain a viable black howler monkey population by protecting habitat for howlers and other wildlife species and conserve the natural resources of the Community Baboon Sanctuary*

The objective of the Natural Resource Management Programme is to effectively manage the CBS in order to protect the habitat of the black howler monkey, the conservation of other wildlife and the sustainable use of natural resources within the CBS. This objective may be expanded to other management zones as they are developed. This is linked to the Protected Areas Management section of the CBS Strategic Plan as well as to the mission of the CBS that calls for conserving the natural resources of the CBS through education, eco-cultural tourism, scientific research, and promotion of cottage industries for the socio-economic benefit of the communities and ecological integrity of the Belize River Valley area. The specific objectives are to:

- Maintain a Viable Population of Black Howler Monkeys
- Monitor Landholder Conservation Pledges
- Maintain 66 ft Forest Reserve Buffer along Belize River and all Watercourses
- Address Overexploitation of Fish, Reptile and Wildlife Species in and Around the CBS
- Create Management Zones in Greater CBS Area to Increase the Scope and Depth of Management
- Develop Strategic Partnerships with Conservation NGOs and GOB concerning CBS Linkages to the Northern Biological Corridor
- Promote Reforestation and Ecological Restoration of Degraded Lands in the CBS
- Develop a Strategy to Deal with the Issue of Free-Ranging Cattle
- Wildfire Management Planning

Research and Monitoring Programme

Overall Objective: *To facilitate applied conservation, socio-economic and ecotourism research towards increasing both management effectiveness and biodiversity conservation, and to ensure effective monitoring and evaluation*

The objective of the Research and Monitoring Programme is to effectively manage both research and conservation monitoring activities conducted in the CBS. The Programme involves three research areas: scientific-based conservation research; socio-economic research and ecotourism research, as well as conservation monitoring programmes. While ecotourism could certainly be considered part of socio-economic research, it has been separated out because of its importance in generating revenue for CBS operations.

Community Development Programme

Overall Objective: *To promote cottage industries for the socio- economic benefit of the communities and ecological integrity of the Belize River Valley area*

The objective of the Community Development Programme is based on the 2011 CBS Strategic Plan. The Plan focuses, in part, on building the capacity of CBSWCG's staff members and stakeholders in

promoting cottage industry development, mainly through training. In addition, the Plan focuses on developing the eco-cultural tourism product of the CBS area, with an emphasis on the rich Kriol culture. The strategies proposed to achieve this goal are product development, development of cottage industries and marketing and promotion. The specific objectives are to:

- Assist Landowners in Identifying Economic and Other Opportunities
- Coordinate Training for Cottage Industries
- Develop Micro-Financing Opportunities for CBS Landowners
- Promote the Production of Local Crafts
- Assist Existing Projects and CBOs

Tourism Programme

Overall Objective: Development of the eco-cultural tourism product of the CBS area, with an emphasis on the rich Kriol culture

Tourism in Belize is one of the most important industries to the Belizean economy, representing approximately 25% of the country's foreign exchange. Tourism in Belize can be divided into two broad categories: cruise ship visitors who visit Belize for the day, and overnight visitors. In 2010, approximately three-quarters of the one million people who traveled to Belize came from cruise ships. All cruise ship passengers enter Belize through Fort George in Belize City, and with ship time constraints, visitors are limited in their destinations within the country.

Eco-Cultural Tourism – The 2011 CBS Strategic Plan calls for pursuing eco-cultural tourism development by implementing three major strategies: (1) Product Development; (2) Development of Cottage Industries; and (3) Marketing and Promotion. Given that tourism is the most important revenue stream for the CBS, developing and implementing a quality tourism programme is essential to the financial sustainability of the CBS. A financially strong tourism programme is also the primary driver for the CBS and CBSWCG to fully achieve their mission. In short, growing tourism revenues are critical for the CBS. In summary:

- The CBS needs to quickly and comprehensively address the competitive ecotourism marketplace that now exists in Belize. This is especially true with the recent focus on cruise ship-based tourism.
- There are several issues that surround tourism development and tourism capture in the region. Internally (i.e., on lands that are currently within the 'boundaries' of the CBS. Internal competition can be potentially antagonistic or complementary. The short-term renovation of the CBS Museum building is also essential to 'bridge' the CBS to a period where a more robust tourist infrastructure emerges.
- There are also external issues surrounding ecotourism. These include, the need for marketing and accounting capacity, the need for an ecotourism strategic plan, the need to revisit the tourist product the CBS offers (what tourists actually do when in the CBS), the need to be proactive in contacting national tourism operations and cruise ship tourism companies. The CBS needs to think what it can and should offer in terms of tourist activities and amenities and to provide a richer and longer tourist experience.
- Seasonality must also be fully addressed. The tourist season at the CBS runs essentially from December to May. Tourism planning and management needs to address this reality and concentrate efforts during this critical economic period. Failure to maximize capture has impacts on the off-season and overall financial integrity of the operation.
- Need to form better partnerships with foreign partners, whether they are tourists, College and Universities, NGO partners or Belizeans living abroad (especially in the U.S. and Canada).

Infrastructure Management Programme

Overall Objective: *Develop facilities and infrastructure that foster eco-cultural tourism, provide appropriate spaces for CBS administration and reflect the Kriol character of the region*

The CBS also operates a trail system in Bermudian Landing on a small parcel of land. The trail system is currently restricted to this area in part due to the neglect of other trails and in part due to the fires that occurred throughout the Sanctuary in 2011 (it is estimated that 70 – 75% of the CBS experienced some level of fire disturbance). New trail systems need to be developed that offer a variety of experiences and in the diversity of habitats within the CBS.

The CBS Museum needs to be re-aligned with the CBS mission. This means that the exhibits and central focus need to better reflect live in the Belize River Valley. An initial alteration of the museum began in spring 2012. The CBSWCG needs to review the current contents of the museum and make recommendations on what exhibits might be appropriate to communicate the mission of the CBS and the Kriol lifestyle in the region.

Administrative Programme

Overall Objective: *Provide institutional strengthening for the CBSWCG in order for the Board to effectively implement the strategic plan and build management capacity*

The administrative programme is centered on streamlining CBS management to make it more accountable, more transparent and more effective. Much of the direction for the administrative programme is based on the 2011 Strategic Plan for the CBS.

Based on a need assessment conducted as part of the 2011 Strategic Planning process, the results pointed to the continued need for an Advisory Council for capacity building. Such a technical board should act as the mechanism for vetting CBS proposals and reviewing CBS operations. While the previous iteration of the Advisory Council was not completely successful, this was mainly due to a lack of communication between the CBSWCG Board and the Advisory Council.

One of the most significant recommendations in this management plan is to re-structure the management of the CBS. The CBS needs staff that can carry out its mandate to the communities of the CBS, the Belize River Valley and the country. The management structure of the CBS has involved various iterations in the positions of Communication Officer, Community Development Officer, Protected Areas and Education Coordinator, Project Office and Finance Officer. It is recommended that the roles and responsibilities of each of these positions be evaluated, compiled and re-structured based on prioritized need and funding availability.

CBS in Regional and National Conservation Planning

The CBS is located along both of the *Maya Mountains to Crooked Tree Corridor* as well as the *Shipstern to Crooked Tree Biological Corridor*. The CBS thus represents an important geographic location that if managed effectively, can enhance the integrity of both Corridors. Given these ecological and geographical linkages, the CBS not only has importance as a wildlife corridor of national importance, it also has an important role to play in providing leadership in a broader, regional and national context in terms of conservation strategies and programmes for private lands in the corridor system. In this way, the CBS has an opportunity to forge strategic alliances with other conservation partners in the Belize River Valley and across Belize to help make the northern biological corridor a sustainable reality.

A Belizean Rainforest: The Community Baboon Sanctuary Book

Currently, the CBS receives no direct revenue from the sale of this book. It is used as part of the tour guide training programme so the CBS buys them from the organization *Community Conservation in* the U.S. for this purpose. The book is out dated and needs to be updated and re-organized. The CBS leadership needs to work with *Community Conservation* to come to a new agreement regarding both book updates and CBS profits from book sales or consider working with another group/partner to develop the next generation of CBS book whereby the CBS is both highlighted in the book and gains revenue from its sale.

The Future of the CBS and the CBSWCG

This Management Plan has been developed based on the premise the CBSWCG working with CBS staff and the CBS Advisory Council, can build its capacity to expand its role as overseer of implementation of this management plan. The CBSWCG is comprised of a group of hard working, dedicated members that have worked voluntarily and often under hardship, to maintain the CBS and solidify and expand its role in conservation and community development efforts in the Belize River Valley.

To fully achieve its mission, the CBSWCG will needs to have a close working relationship with CBS staff and the CBS Advisory Council and acquire additional training and expertise when needed. Equally important, during the implementation of the Management Plan the CBSWCG will need to simultaneously provide their time-tested guidance in steering the CBS and ensuring it is and remains a truly community-based enterprise reflecting the culture, values and perspectives of the Kriol villages in the Belize River Valley.

The CBS is at its core, a voluntary effort and as such, its management is dependent on the participation and will of each individual landholder and/or household. The basic conservation management unit remains the individual landholding whether it is a freehold or lease. Thus stakeholder/landowner buy-in and inclusion is essential in every facet of the CBS operation and community and stakeholder input is essential to the long-term viability of the CBS.

TABLE OF CONTENTS

List of Tables and Figures

Tables

Figures

Acknowledgments

This project and consultancy would not be possible without the existence of the Community Baboon Sanctuary, its landowners, its management and its staff. At the heart of the CBS are the Kriol people of the lower Belize River Valley and their long-held respect for the protection of the black howler monkey. Kriol culture is the ultimate reason why the CBS exists. The CBS remains a formal acknowledgement and organizational manifestation of what has occurred in the lower Belize River valley for 200 years.

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Finally I would like to thank PACT for funding this work and their dedication to conservation in Belize.

Frequently Used Acronyms

BAS	Belize Audubon Society
BELTRAIDE	Belize Trade and Investment Development Service
BELRIV	Belize River Valley Association
BEST	Belize Enterprise for Sustained Technology
CARICOM	The Caribbean Community and Common Market
CBS	Community Baboon Sanctuary
CBSWCG	Community Baboon Sanctuary Women's Conservation Group
CBWS	Cockscomb Wildlife Sanctuary
CCA	Community Conserved Area
CCAD	Central American Commission on Environment and Development
CITES	Convention on International Trade in Endangered Species
CLO	Community Liaison Officer
CTWS	Crooked Tree Wildlife Sanctuary
DFC	Development Finance Corporation
EDP	Economic Demonstration Project
GEF	Global Environmental Facility
GOB	Government of Belize
ICDPs	Integrated Conservation and Development Projects
IICA	Inter-American Institute for Cooperation on Agriculture
IUCN	World Conservation Union (International Union for the Conservation of Nature)
LAC	Local Advisory Committee
LMTs	Local Management Teams
MBC	Mesoamerican Biological Corridor
MNREI	Ministry of Natural Resources, Environment, Commerce and Industry
NEAC	National Environmental Appraisal Committee
NGO	Non-Governmental Organization
NLAC	National Lands Advisory Committee
NPAPSP	National Protected Areas Policy and Systems Plan
NSASP	National Protected Areas Systems Plan
PA	Protected Area
PACT	Protected Areas Conservation Trust
PATEC	Protected Areas Technical Evaluation Committee
PFB	Programme for Belize
PUP	People's United Party
RAC	Regional Advisory Committee
SCWS	Spanish Creek Wildlife Sanctuary
UDP	United Democratic Party
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WCS	Wildlife Conservation Society
WCG	Women's Conservation Group
WWF	World Wildlife Fund

1. Introduction

1.1 Background and Context

The country of Belize, lies between 15° 53' - 18° 30'N and 87° 15' - 89° 15'W, is bounded to the north by Mexico (Quintana Roo and in the extreme north-west, Campeche Provinces) and in the west by Guatemala (Peten and, in the extreme south, Izabal Provinces). The Community Baboon Sanctuary (CBS) is located on the northern coastal plain of Belize and is somewhat geographically centered on the Village of Bermudian Landing (Longitude 17° 55' 65"N; Latitude: -88° 53' 07" W). The location of the CBS in Belize is shown in the Figure below.

The Community Baboon Sanctuary was established in 1985. Primatologist Dr. Robert Horwich and plant ecologist Dr. Jon Lyon worked with Fallet Young, and local village members from Bermudian Landing, to create a community based sanctuary to protect the diminishing population of black howler monkeys (*Alouatta pigra*). In the first year, 12 landowners signed voluntary pledges to leave a strip of forest along the Belize River, protect trees along property lines to create aerial corridors and to preserve food trees for the monkeys. The present membership is some 170 and includes members of seven area villages, Flowers Bank, Scotland Half-Moon, Isabella Bank, St. Paul's Bank, Willows Bank, Double Head Cabbage, and Bermudian Landing,

The CBS is an IUCN Category IV protected area but it remains a voluntary, community based sanctuary where individual landholder participation is completely voluntary and based on a pledge system.

The Community Baboon Sanctuary's vision is to be a leading grass roots world-class model promoting Belize's natural resources while preserving prime habitat for the movement of wildlife. It also strives to be the leading private community-based reserve working hand in hand with its members for improved economic conditions, social well-being, and providing alternative livelihood through conservation efforts.

As of 1998, the CBS Women's Conservation Group (CBSWCG), a registered NGO, has been the sole management authority of the CBS. The CBSWCG has Articles of Association that dictate its structure and function. The governance of the CBSWCG consists of an Advisory Council and an elected seven member women executive committee representing the seven villages. Their mission is:

> *To promote cooperation with governmental and non-governmental agencies to conserve the CBS natural resources, foster sustainable eco-cultural tourism, assist in the development of cottage industries and enterprises, while at the same time recognizing and encouraging the substantial role of women in the conservation, family and economic sector.*

Since its inception in 1998, the CBSWCG has focused on five key areas: Conservation, Education, Eco-Cultural Tourism, Community Development and Scientific Research. The CBSWCG has been active in project management, undertaking the implementation and completion of several projects including creating livelihood opportunities by sharing revenues more easily for its community stakeholders,

through incentives such as backyard tilapia farming, organic vegetable, pig and chicken farming, environmental education summer programmes and scholarship programmes.

1.2 Purpose and Scope of Plan

This is the first comprehensive management plan to be developed for the CBS since the CBSWCG began managing the CBS in 1998. The plan has been prepared to fit within the framework required by the National Protected Area Policy and System Plan (NPAPSP, 2006). The plan also recognizes the unique nature of the CBS as a Community Conserved Area (CCA) and its unique governance and management structures. The 2011 strategic plan for the CBSWCG also provides a rich context within which to formulate a management plan.

CBS management has gone through a large number of iterations and transitions over the past 28 years and has endured turnovers in staff, lean financial times, periods of internal conflict and external strains. CBS management has also been party to dramatic increases in howler populations, at times, a thriving eco-cultural tourism programme and initiation and management of a host of community development projects, totaling over $900,000 Belize dollars. Management of the CBS has changed from being based solely on black howler monkey protection to include the five major focal points: Conservation, Scientific Research, Education, Eco-Cultural Tourism and Community Development. While laudable, the complex nature of this diverse mission has meant that there has not always been funding, time and capacity to achieve broad success in all areas consistently. In addition, large turnover is staffing has hobbled evaluation and assessment efforts and led to less than optimal communication between CBS management and landholders/residents.

In 2013, the CBS once again finds itself is in the midst of a transition and faces the challenge of bringing all their operations and management to meet the socio-economic, political and environmental challenges of 21st century Belize. Belize has changed a great deal since the inception of the Sanctuary in 1985 and even since the CBSWCG assumed management in 1998. While the CBS has made dramatic positive steps forward and gained enormous experience in the realities of managing a complex Community Conserved Area, the CBS needs to revise its management structure, enhance its management capacity, embrace regional and national conservation initiatives, improve its internal and external communication, reach out to a new generation of citizens of the Belize River Valley and grow both the depth and scope of its management. The overarching purpose of crafting this management plan is to provide the CBS and the CBSWCG with a clear, concise and incremental plan to help the organization achieve its mission.

One other critical aspect of the proposed management plan is the need for the CBS landowners, stakeholders, NGO community and the Government of Belize to fully recognize and embrace the role of the CBS and the CBSWCG not only in terms of conservation and sustainable use of resources in the lower Belize River Valley, but also in the national discussion on both conservation and community development.

As a unique Community Conserved Area (CCA) in Belize, the CBS and CBSWCG have a unique role to play in Belize. As noted by the IUCN (2008):

> "*community conserved areas (CCAs) have emerged as a major new phenomenon in formal conservation circles, though their existence is as old as human civilization itself, International policies and programmes, notably those under the Convention on Biological Diversity, require countries to provide them with recognition and support*."

The CBSWCG deserves both broad recognition and support. The CBS, being the oldest CCA in Belize has the potential to provide enormous benefit to Belize, not just through black howler monkey protection, but through its ability as an organization working on private lands to be a leader in community-based conservation efforts (Berkes 2007).

As a leading CCA in Belize, the CBS and CBSWCG have a prime opportunity to meet the potential of CCAs outlined by the IUCN (2008) and develop a management plan that:

- Provides connectivity across large landscapes and crucial for migration of wildlife to promote genetic exchange and help wildlife in climate change adaptation
- Maintains ecosystem functions and provide substantial ecosystem services such as water flow and soil protection
- Improves the livelihoods of people, securing food, water and other resources (energy, fodder, soil) for security and income
- Creates a center of Kriol cultural identity for local communities and fosters community solidarity and prestige, and significantly highlight and showcase how Belizeans have lived and can live with and within nature
- Builds upon sophisticated ecological knowledge systems, including sustainable land use, which have stood the test of time, as well as developing new sustainable systems
- Develops a unique and specialized adaptive management model that incorporates both conservation of natural resources and sustainable development and is capable of flexible responses to change
- Provides an integrated landscape of wild and agricultural biodiversity and provides ecological and cultural links between components of rural life that often, in recent times, have become artificially compartmentalized.

Given the unique circumstance of the CBS as a CCA, and the fact that it is embedded in the geographical and socio-economic fabric of the villages that comprise it, the current management plan takes a holistic approach to management; the management plan builds on the 2011 CBS Strategic Plan and encompasses the conservation, eco-cultural tourism, community development, scientific research and educational components of the CBS mission. The current plan also has been formulated within the context of a 5-year horizon.

Bridge crossing over Belize River between Bermudian Landing and Scotland Half Moon.

2. Current Status

2.1 Location

The CBS is located in north-central Belize on the northern coastal plain (Figure 1). The boundaries of the CBS are somewhat inexact as surveyed property boundaries have not been determined for all participants and related properties. However, the Sanctuary is somewhat geographically centered on the Village of Bermudian Landing (17° 55' 65"N; -88° 53' 07" W).

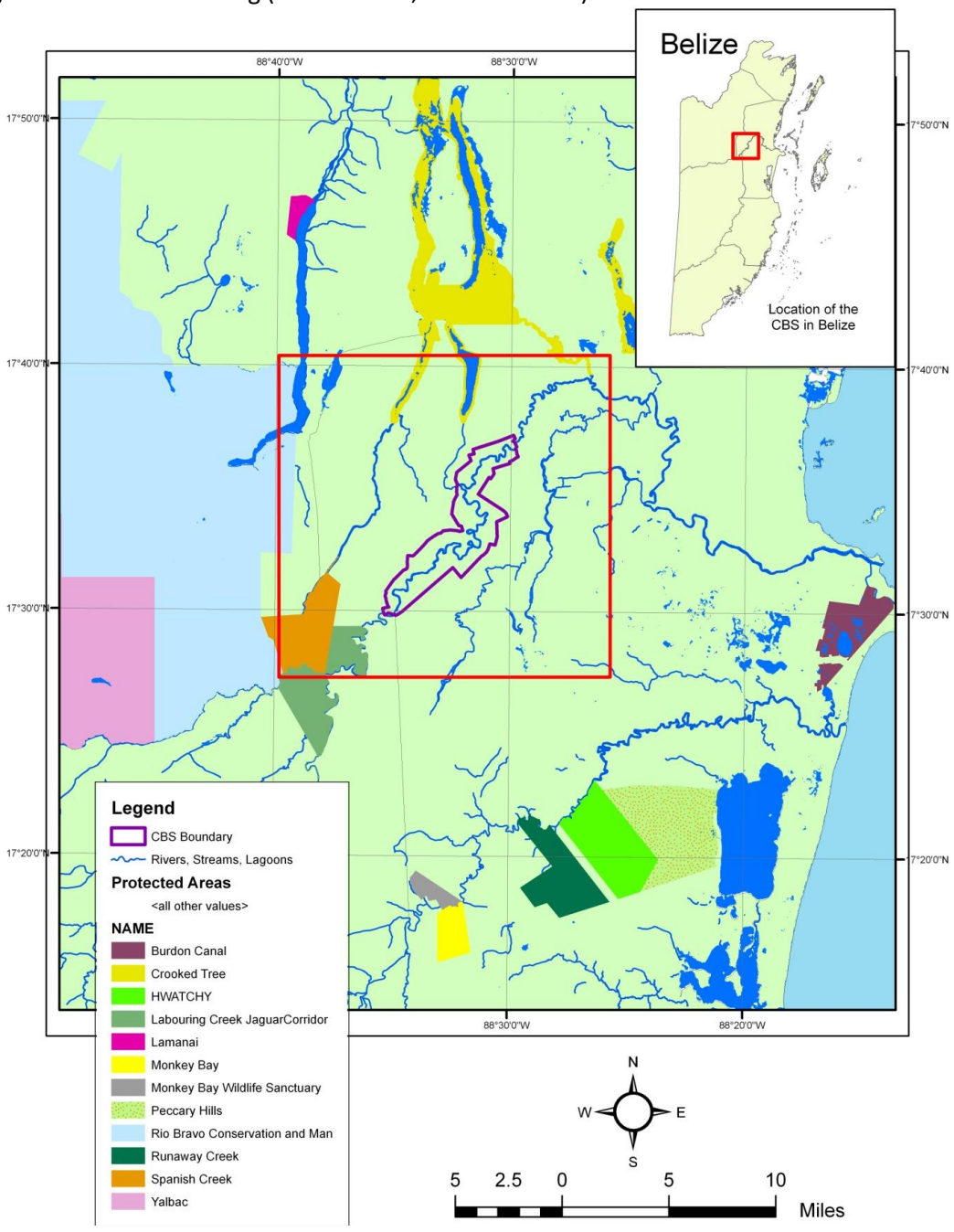


Figure 1. A GIS map showing the location of the CBS in Belize and surrounding protected areas. The map is constructed based on a UTM-NAD27, Zone 16N projection.

Figure 2 shows the village centers and approximate property boundaries in the current Sanctuary. All the villages currently comprising the CBS (Bermudian Landing, Double Head Cabbage, Flowers Bank, Isabella Bank, Scotland Half Moon, St. Paul's Bank, Willows Bank), or adjacent to it (Burrell Boom, Lemonal, May Pen, Rancho Dolores) are in the Belize River watershed, the Belize District and the Belize Rural North Electoral District.

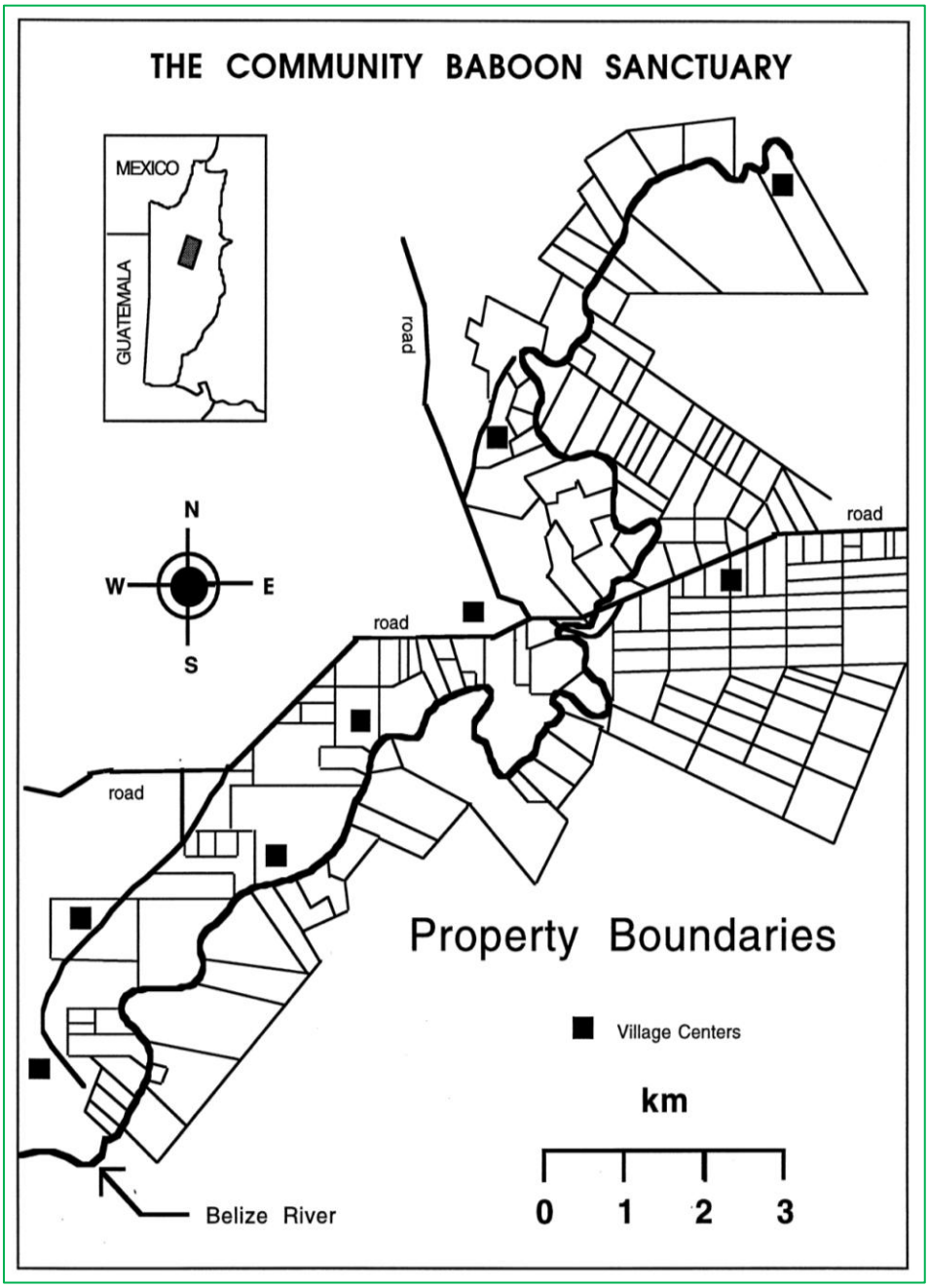


Figure 2. CBS Villages and approximate parcel boundaries.

2.2 Regional Context

The CBS is located in the *Northern Lowlands* region and is adjacent to several other protected areas. The privately held lands of the CBS are near four key protected areas and are also linked to the Northern Biological Corridor. Figure 1 shows the protected areas adjacent to the CBS: the Crooked Tree Wildlife Sanctuary to the north; the Spanish Creek Wildlife Sanctuary and Rio Bravo Conservation Management Area to the west; and the Labouring Creek Jaguar Corridor to the southwest. A summary of the main characteristics of the CBS and its adjacent protected areas is provided in Table 1.

Table 1. A summary of protected areas adjacent to and including the CBS.

Protected Area	Size - acres	IUCN Category	Year Established	Management
Crooked Tree Wildlife Sanctuary	41,297	IV	1984	Forest Department; Belize Audubon Society
Spanish Creek Wildlife Sanctuary	5,985	IV	2002	Forest Department; Rancho Dolores Development Group
Labouring Creek Jaguar Corridor Wildlife Sanctuary	9,184	IV	2010	Forest Department
Rio Bravo Conservation and Management Area	259,134	IV	1988	Programme for Belize
Community Baboon Sanctuary	14,800	IV	1985	CBS Women's Conservation Group

2.3 National Context

The CBS can be viewed in a national context in two major ways. In the first instance, it is as a flagship community-based conservation area (CCA). The second is as a geographically well placed link in the northern biological corridor in Belize. The two roles are not mutually exclusive given that much of the proposed biological corridor consists of lands that are in various levels of private ownership.

From its start, the CBS has been touted as a model for wildlife conservation and participatory ecotourism development in a community-managed protected area (Alderman 1990; Boo 1990; Alexander 2000). As noted above, the CBS can be classified as a CCA. CCAs are defined as:

> N*atural and modified ecosystems including significant biodiversity, ecological services and cultural values voluntarily conserved by concerned indigenous and local communities through customary laws or other effective means* (IUCN 2008).

Furthermore, CCAs are characterized by several defining features, including: (1) specific indigenous peoples or local communities (sedentary or mobile) are closely 'concerned' about the area (related to them culturally and/or because of livelihoods); (2) such communities are major players– i.e. hold power (*de jure* or *de facto*) in deciding, implementing and enforcing management decisions; and (3) the community voluntary management decisions and efforts achieve conservation results— through intentional conservation or other purposes (IUCN 2008).

The CBS has stood for 28 years as an example of community-based conservation and helped define a whole new category of protected area in Belize and globally. Given its historical importance, the CBS

has received much local, national and international attention (Edington et al. 1997; Horwich et al. 2011). More importantly, the CBS has had a catalytic effect on rural communities in Belize, Belizean NGOs and the Government of Belize (Horwich et al. 2011). This catalytic impact led to a wave of community-based conservation and ecotourism projects across Belize and spawned the development of co-management agreements around Belize (Young and Horwich 2007). In this way, the CBS remains an important conservation presence in Belize and those associated with it have amassed up to 28 years of experience in working through the complicated dynamics involved in managing such a complex ecological and socio-economic landscape. Thus, the CBS is an important part of the conservation and sustainable development community in Belize and has earned a strong voice in the national conservation discussion.

The second way in which the CBS can and should be viewed in a national context is that that the private lands that comprise the CBS are linked to the northern biological corridor (Meerman et al. 2000) and the CBS has a role to play in making the corridor functional and sustainable. The location of the CBS immediately adjacent to the two main wildlife corridors in Belize is shown in Figure 3. Based on the Corridor Feasibility Study (Meerman et al. 2000), the *Baboon Sanctuary Corridor* is classified as a supported corridor with links to the Belize River Node and the Cox/Mucklehany Corridor. The Cox Lagoon/Mucklehany Lagoon Corridor, in turn, is a supported corridor with links to the Belize River Node and the Baboon Sanctuary corridor. The latter follows Mussel Creek and the southern banks of the Belize River. The Crooked Tree Corridor also impacts the outer villages of Lemonal and Rancho Dolores contiguous with CBS lands (Figure 3).

Given these ecological and geographical linkages, the CBS not only has importance as a wildlife corridor of national importance, it also has an important role to play in providing leadership in a broader, regional and national context in terms of conservation strategies and programmes for private lands in the corridor system. In this way, the CBS has an opportunity to forge strategic alliances with other conservation partners in the Belize River Valley and across Belize to help make the northern biological corridor a sustainable reality.

To highlight the importance of these corridors and adjacent protected areas to the broader conservation community in Belize and internationally, from 1990 to 2009, the World Bank implemented GEF financed projects in the biodiversity focal area in Belize totaling some US$12.95 million in grants.

Aerial photograph of Double Head Cabbage Village.

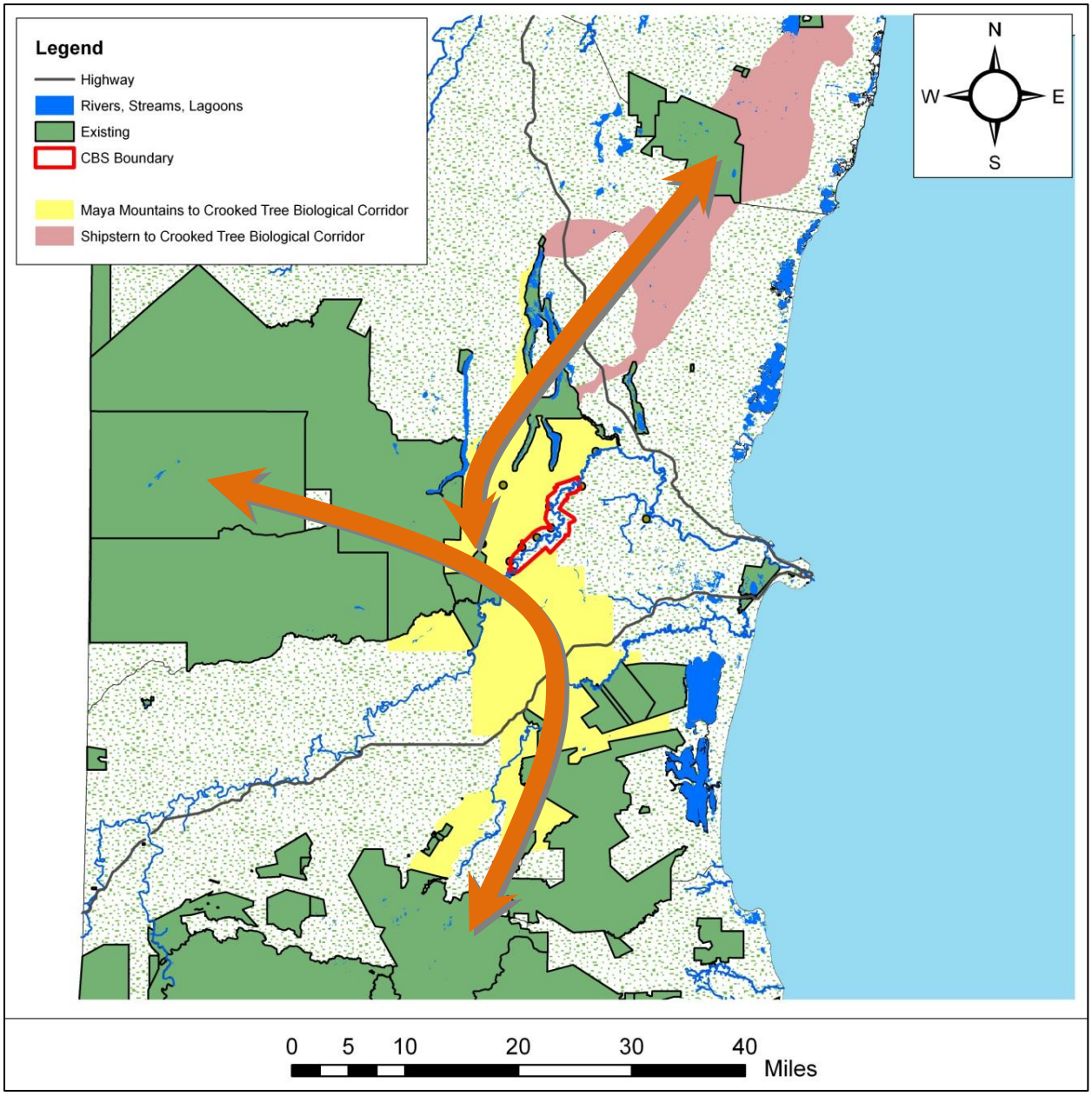


Figure 3. This GIS map shows existing protected areas (green) as well as the two proposed biological corridors for Belize: the Maya Mountains to Crooked Tree Corridor (yellow) and the Shipstern to Crooked Tree Biological Corridor (mauve). The CBS boundary (red) is along both of the wildlife corridors and represents an important geographic location that can enhance the integrity of both Corridors.

There have also been several other protected areas in Belize that have developed management plans in the past 15 years. A partial listing of some of those plans is provided below. These management plans as a body, provide both a reference and management toolkit for the various management strategies and activities that will be implemented in the CBS.

PROTECTED AREA	Timeframe
Terrestrial	
Chiquibul National Park	2008-2013
Sarstoon-Temash National Park	2012-2017
Rio Bravo Conservation and Management Area	2004-2010
Indian Hill Lagoon Management Area	2007-2012
Coastal Zone/Marine	
Sapodilla Cayes Marine Reserve	2011-2016
South Water Caye Marine Reserve	2010-2015
Laughing Bird Caye National Park	2011-2016
Gladen Spit and Silk Cayes Marine Reserve	2011-2013

Students participating in the CBS Summer Program.

Linkage to the Mesoamerican Biological Corridor

The CBS can also be viewed in the broader, international context of the Mesoamerican Biological Corridor (MBC) effort. The MBC spans eight countries: Guatemala, Belize, Honduras, El Salvador, Nicaragua, Costa Rica, and Panama and the five southern states of Mexico. Figure 4 shows the geographic scope of this effort. The CBS's geographical location and its status as a Community Conserved Areas (CCA) make it a significant contributor to the MBC effort, especially given the important role of Community Conserved Areas (CCAs) along the corridor (Camacho et al. 2007).

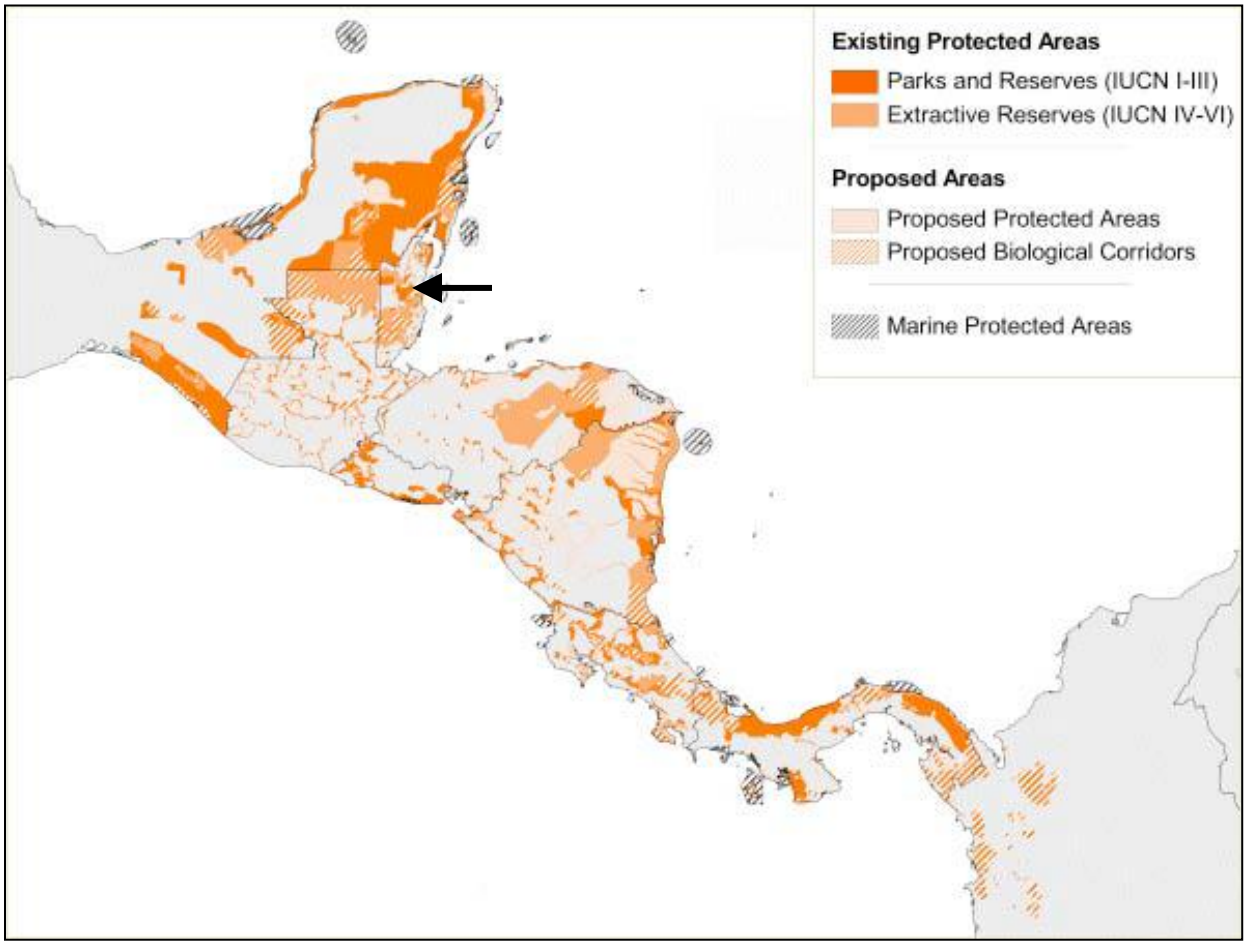


Figure 4. A summary of various existing categories of protected areas distribution as well as proposed protected areas and corridors along the Mesoamerican Biological Corridor. The black arrow shows the approximate location of the CBS along the Corridor.

2.3.1 Legal and Policy Framework

The CBS is officially an **IUCN Category IV** protected area but it remains a voluntary, community based sanctuary (private protected area) where individual landholder participation is completely voluntary and based on a pledge system. When first formed in 1985 and 1986, the Village Council of each village was consulted and asked to allow the formation of the Sanctuary, although it was clearly enunciated the choice as to join the CBS or not was (and remains) based entirely on individual landholder choice. It should also be noted that the Area Representative was notified of the formation of the Sanctuary, but given that it was and is a private protected area, no other government approval was sought or required. It is listed as a Category IV protected area in the official GOB listing of protected areas but there was no and is no statutory instrument regarding the CBS.

According to the National Protected Areas System Plan - NPASP (2005), the CBS falls under the community governance category of protected area governance. The NPASP defines community governance as follows:

> ***Community Governance***: Authority and responsibility for managing the natural resources rest with the indigenous peoples and/or local communities with customary and/or legal claims over the land and natural resources. It is therefore analogous to private governance and accountability to society at large usually remains limited, although it is at times achieved in exchange for recognized rights or economic incentives. This form of governance is usually associated with areas (including those under partial private ownership) that are collectively controlled or managed under traditional or locally agreed rules. There are good examples in Belize (e.g. Community Baboon Sanctuary, Aguacate Lagoon) and this form of governance, under similar guidelines to those applied to private protected areas, should be accommodated in the national protected area system.

The CBS was under the auspices of the Belize Audubon Society for a decade from 1986 to 1996 when that relationship was eventually terminated.

The current management body of the CBS is the CBS Women's Conservation Group (CBSWCG) that took over CBS Management in 1998. The CBSWCG has *Articles of Association* that dictate its structure and function (see Annex A). The CBSWCG was registered as a non-profit organization by the Ministry of Human Development on 19 September 2006 (Certificate 73/06). As part of this NGO status, the CBSWCG is required to submit a statement of accounts and a certified financial statement each year.

The CBS is a member of the *Association of Protected Areas Management Organizations* (APAMO), an organization that was formally established as a legally registered non-profit, non-governmental organization in October of 2007 (*www.apamo.net*). Other APAMO members are:

- Belize Audubon Society (BAS)
- Forest and Marine Reserve Association of Caye Caulker (FAMRACC)
- Friends of Mayflower and Bocawina National Park (FMBNP)
- Friends of Swallow Caye Wildlife Sanctuary (FSCWS)
- Programme for Belize (PfB)
- Rancho Dolores Environmental and Development Group (RDEDG)
- Sarstoon Temash Institute for Indigenous Management (SATIIM)
- Southern Environmental Association (SEA)
- Steadfast Tourism and Conservation Association (STACA)
- Toledo Institute for Development and Environment (TIDE)
- Ya'axché Conservation Trust (YCT)

There are several Government of Belize (GOB) Ministries, Departments, Statues and Conventions that are relevant to the CBS, its operations and management and those are briefly described below.

Relevant GOB Ministries and Departments

The ***Ministry of Forestry, Fisheries, and Sustainable Development*** is responsible for the following sectors and departments: Climate Change, Coastal Zone Management Authority, Environment, Fisheries, Forestry, Protected Areas and Reserves, and the Protected Areas Conservation Trust (PACT). This ministry became effective on March 14th 2012. Under the Ministry are five relevant Departments and an important Statutory Body.

The ***Forest Department*** is the most important Agency that deals with Belize's forest resources. The Forest Department is responsible for the implementation of the Forest Act, 1960, the National Parks Systems Act, 1981 and the Forest Fires Protection Act. This agency also administers the enforcement and implementation of wildlife protection functions mandated under the Wildlife Protection Act, 1981. The Department is organized under seven main Programmes: (1) Protected Areas Management Programme; (2) Forest Resources Planning and Management Programme; (3) Forest Revenue and Exploitation Control Programme; (4) Biodiversity Programme; (5) Law Enforcement Programme; (6) Wildlife Programme; and (7) National and International Partnership Programme.

The ***Fisheries Department*** mission is to provide the country and people of Belize with the best possible management of its aquatic and fisheries resources, with a view to optimize the present and future benefits through efficient and sustainable management. The Department is divided into four units: Capture Fisheries; Aquaculture and Inland Fisheries; Ecosystems Management; and Administration and Support.

The ***Department of the Environment*** is responsible for fostering the prudent use of proper management of the natural resources of Belize, the preservation, protection and improvement of the environment and the control of pollution. The Department has three Units: (1) environmental compliance monitoring and enforcement unit centered on the enforcement and coordination of enforcement of environmental standards and monitoring compliance with those standards; (2) project evaluation/environmental impact assessment centered on the implementation of the Department's environmental clearance process, with respect to project proposals, programmes, activities and undertakings requiring environmental screening, to ensure that the environmental implications associated with these activities are adequately addressed; and (3) environmental law, planning and policy.

The ***Protected Area Conservation Trust (PACT)*** is a Statutory Body formed in 1995 under the Protected Areas Conservation Act that called to establish a trust for the protection, conservation and enhancement of the natural and cultural resources of Belize; to establish a Trust Fund for the Trust; to establish a Board of Directors to control and manage the affairs of the trust; and to provide for matters connected therewith or incidental thereto. PACT provides funds for supporting conservation and promoting environmentally sound management of Belize's natural and cultural resources to foster sustainable development.

The ***Ministry of Natural Resources and Agriculture*** is responsible for land and land management, land surveys, mining, the National Integrated Water Resource Authority, physical planning (including new subdivisions) and solid waste management as well as the agricultural sector in Belize.

The ***Ministry of Tourism and Culture*** is responsible for the tourism sector in Belize as well as archaeology, archives, arts and culture, cultural development and museums. There are two key Departments and/or Statutory Boards relevant to the current management plan.

The ***Belize Tourist Board (BTB)*** represents a strategic partnership between government and the private sector to develop, market, and implement tourism programmes that will fulfill the emerging needs of local industries and the international tourism marketplace for the benefit of Belize and Belizeans. The BTB has been a statutory body within the Ministry of Tourism since 1990, and is the primary policy making entity in Belize's tourism sector. The BTB states that its mission is to be a, "*strategic partner in marketing the Belize Tourism Product, developing tourism initiatives and programmes, and implementing tourism policies, to address the changing needs of visitors and stakeholders*"(Belize Tourism Board, 2011).

The ***National Institute of Culture and History (NICH)*** seeks to encourage Belizeans and persons interested in Belize to better understand our historical and ethnic roots and instill pride in Belizeans about their country's unique cultural heritage and shared national identity. NICH works for the preservation of Belize's ancient and historical era monuments and artifacts; the exhibition and interpretation of Belize's documented, photographic and oral history and the promotion of contemporary performing, literary and plastic arts.

Relevant BOB Statutes

Wildlife Protection Act, Chapter 220, Revised Edition 2000. The Wildlife Protection Act regulates the hunting of wildlife as game or for other use. The act specifies species protected against hunting by listing of the species under the "Schedule". This act allows for the establishment of regulations controlling hunting by the declaration of closed hunting areas, determining periods for the prohibition of hunting, the prohibition of hunting of specified animals of specific size limits etc. The CITES Convention is also administered by this Department.

Land Utilization Act, Chapter 188, Revised Edition 2000. The original Land Utilization Act was passed in 1981 and provides for measures to govern the use and development of land, and introduces measures for the conservation of land and watersheds. In the 2000 revisions, the act requires a person to submit an application accompanied by a proposed plan of the parcel of land intended for subdivision. The approval of a subdivision will be needed for any land transaction including transfers, and registration of parcels. This act also allows for the establishment of a *Land Subdivision and Utilization Authority* (LUA). The LUA receives all applications and is responsible for approval of subdivision plans, and for the promotion of *National Land Use Planning Framework* (MNREI, 2011).

The ***Fisheries Act (1980)*** is administered by the Ministry of Agriculture and Fisheries. It seeks to control all aspects of the fisheries resources in Belize by establishing regulations controlling minimum size, types of fishing equipment to be used open and closed seasons and registration of fishing boats and fishermen. Overall, the Act provides regulation of the fishing industry, and is directly concerned with maintaining sustainable fish stocks and protecting the freshwater as well as environments.

The ***National Lands Act (1992)*** regulates the distribution of national land and the overall delineation of national reserves. It seeks to provide some management and control of land by requiring environmental impact assessments to be conducted for land over 500 acres. It also establishes a 66ft width river frontage as public lands. This Act is administered by the Ministry of Natural Resources Environment and Industry. Under the Act, "National Lands" means all lands and sea bed, other than reserved forest within the meaning of the Forest Act, including cayes and parts thereof not already located or granted, and

includes any land which has been, or may hereafter become escheated to or otherwise acquired by Government of Belize.

The ***Forest Act*** (1990) promotes the forestry industry, with the implementation of conservation techniques. The Forest Policy of Belize is implemented through the Forest Act and allows for the establishment of Forest Reserves on national lands. The purpose of the reserves is to ensure an adequate and increasing supply of timber and other forest products for economic purposes. Nature conservation, tourism and environmental protection are also of recognized concern. The Forest Reserves are the only terrestrial reserves allowing controlled extractive use.

The ***Wildlife Protection Act (1981)*** was established "to provide for the conservation, restoration and development of wildlife, for the regulation of its use and for all other matters connected therewith"

The ***Environmental Protection Act (1992)*** was established "to promote the preservation and improvement of the environment, the rational use of natural resources, the control of pollution, and matters connected therein"

The **Environmental Impact Assessment Regulations (1995)** outlines rules that govern the type and size of development that requires an Environmental Impact Assessment (EIA), and requires the preparation of EIAs for activities or projects near, or impacting on, protected areas.

The **National Parks Systems Act (1981)** is an act for the preservation and protection of highly important natural and cultural features. It also regulates scientific, educational and recreational use of Protected Areas. The "National Park System" includes all national parks, nature reserves, wildlife sanctuaries and natural monuments.

The **Village Councils Act** (1999) defined the jurisdiction of village councils throughout Belize over land-use issues, governs key aspects of rural life in Belize. Importantly, the Act allows Village Councils to establish by-laws for: *"regulating the passing of livestock through the streets of such village and specifying the streets through which the livestock shall be allowed to pass, the time of such passing and the method of leading or driving the livestock"*.

<u>Relevant International Conventions and Agreements</u>

Belize is a signatory on the following conventions:

- *Convention on International Trade in Endangered Species of Wild Fauna and Flora* – CITES (1986)
- *RAMSAR Convention on Wetlands* (1989)
- *Convention Concerning the Protection of the World Cultural and Natural* Heritage (1990)
- Convention for the Conservation of Biodiversity and Protection of Priority Wild Areas in Central America (1992)
- *Central Alliance for Sustainable Development* – ALIDES (1992)
- *Convention on Biological Diversity* (1993)
- United Nations Framework Convention on Climate Change (1994)
- *Central American Agreement on Biodiversity* (1994)
- Convention on the Conservation of Migratory Species of Wild Animals (1998)
- *United Nations Millennium Development Goals* (2000)
- Convention on Nature Protection and Wildlife Preservation in Western Hemisphere (unknown)

2.3.2 Land Tenure

The main legal statutes that relate to land tenure are the **Law of Property Act** (Chapter 190) and the **Registered Land Act** (Chapter 194). The latter statute governs all land transactions of Belize (the laws of Belize can be viewed at www.belizelaw.org). The management of national lands (government owned lands excluding forest reserves and national parks) was transformed through the passage of the **National Lands Act** (NLA) in 1992. The NLA has been instrumental in making land more accessible to the general populace as national lands are sold at rates that are well below the market value, thus making land more affordable to the general public (Iyo et al. 2003). The **Law of Property Act** also allows for acquisition of property to take place in the instance that one has settled on a land for more than 30 years. In addition to mere settlement, one has to have continuous undisturbed possession of land for 30 years. If the Supreme Court finds that possession is established, they may issue a declaration of Title in respect of said easement, right or privilege to the individual putting forward the claim. With the repeal of the **Alien Landholding Act** in March 2001, the National Lands Act was amended to require an "alien" to first to obtain a license from the Minister responsible for lands before he/she can hold an interest in national lands for acreages in excess of an aggregate of 10 acres in rural areas and ¼ acre in urban areas (Iyo et al. 2003).

All Belizeans have a right to access and use land, either through lease from the government or freehold title, as individuals, corporations or collective trusts. Belize is characterized by a variety of landholdings with ownership (tenure) vested through both private freehold and leasehold titles in both urban and rural areas. National Estate lands are available for leases or currently in lease application process (Iyo et al. 2003). Over half of the land area of Belize is still owned by the government but only a small portion is available to residents in the form of lease-to-own plots of land.

Leasehold is a form of land tenure or property tenure where one party buys the right to occupy land for a given length of time (term of years). Leasehold estate can be bought and sold on the open market. Leasehold differs from a ***freehold*** (fee simple estate) where the ownership of a property is purchased outright and thereafter held for an indeterminate length of time.

Freehold land is registered under the "common law" deeds system and is essentially ownership while there various kinds of leases under which land users rent the land from the government (World Bank 1996). Freehold land can and has been acquired through several different mechanisms. Crown Grants were issued from 1817 to 1981 and registration of these grants was required of all landowners. In 1981 the Crown Lands system was replaced by a Minister's Fiat. Most freehold rights are regarded as fee simple absolute tenures which are documented through a recorded deed, certificate of title or a land certificate. In general, leases are difficult to obtain in Belize because history of ownership of land is required and can only be obtained by means of adjudication, a process that can be lengthy and expensive (Hyde 1991).

Property purchasers can take title to freehold property in Belize in one of three different ways. They are: Deed of Conveyance, Transfer of Certificate, and Land Certificate.

(i) Deed of Conveyance

The oldest form of title ownership is by a Deed of Conveyance. Ownership by way of conveyance is a registered right to ownership of property. Ownership by conveyance can be converted to a Certificate of Title via an application for first registration. Any subsequent buyer is issued a Transfer Certificate of Title. It should be noted, however, that a Deed of Conveyance is a valid legal title once an attorney has confirmed that the seller has good title to the property.

(ii) A Transfer of Certificate
A Transfer Certificate of Title is a physical title to a particular parcel of land. This form of ownership is secure. It is more costly and time consuming to transfer title on a Transfer Certificate of Title than on a Deed of Conveyance.

(iii) A Land Certificate
A Land Certificate is an absolute title and applies to property purchases in new or specially designated areas. The Government is in the process of re-registering all freehold lands under the Registered Land Act of 1987 to achieve an eventual uniform system of nationwide land ownership. However this will take time, as some areas have to be re surveyed.

Registered Leases

Barnes (1995) summarizes that registered leases are generally granted for a period of 20 years and typical lease conditions include: (1) occupation of the land within 6 months of the approval date; (2) compliance with the zoning, building and planning regulations; and (3) completion of improvements on the property. The process of acquiring a lease generally begins at the District level with the applicant approaching the village lands committee for a piece of land. If approval is obtained for a particular parcel of land, the applicant will go to the nearest District Lands and Surveys Office where (s)he is required to complete an information sheet containing personal data, proof of residency, type of development intended, and family income.

It is important to note that rents paid during the lease period are applied directly to the purchase price. Many individual leaseholders believe that the lease will ultimately result in a purchase of freehold rights. In the standard lease form there is a specific provision which states that: "Rents paid on this leasehold interest will be credited towards the purchase price."

Unregistered Leases

Barnes (1995) notes that this category of land tenure includes all landholders who are working the land and who have applied for a lease but who do not have any rights reflected in the Register. In the best of cases this will include those who have a lease approval form, but due to a backlog in surveys (or some other reason) have not received a Certificate of Lease.

The common-law system of conveyance is the vehicle for obtaining land tenure to all lands which are subject to The Registered Land Act. A deed of conveyance is prepared, drafted and executed by the contracting parties and thereafter sent for recording at the Land Titles Unit, a segment of the Lands and Surveys Department. The primary responsibility of the Lands and Surveys Department is the administration of all land tenure in Belize. Hence, it manages the processes of determining, recording and dissemination of all information about land, including ownership and value.

In achieving its daily mandate, the Commissioner of the Lands and Surveys Department delegates certain functions to the various units of the department such as: Land Registry and Titles Unit, Surveys and Mapping, Valuation, Land Information Center, Physical Planning and National Estate Section.

Land Tax

This tax is collected by the Department of Lands, and is assessed based on the unimproved value of the land. Table 2 below details the values for each district represented in Belize Dollars ($BZD). Land is taxed at the rate of 1%.

Table 2. Declared Unimproved Values per Acre by District in Belize.

Categories	Corozal and Orange Walk	Cayo	Belize	Stann Creek	Toledo
Agricultural 130 acres or less	$ 100.00	$ 100.00	$ 100.00	$ 100.00	$ 100.00
Agricultural 31 to 300 acres	$ 500.00	$ 550.00	$ 600.00	$ 500.00	$ 100.00
Agricultural 301 acres or more	$ 600.00	$ 650.00	$ 700.00	$ 600.00	$ 300.00
Sub-urban	$ 1,000.00	$ 1,000.00	$ 1,500.00	$ 700.00	$ 500.00
Beaches & Cayes	$ 10,000.00	N/A	$ 10,000.00	$ 10,000.00	$ 5,000.00
Village lots (1 acre or less)	$ 1,000.00	$ 1,000.00	$ 1,000.00	$ 1,000.00	$ 500.00

Land Ownership in the CBS

Lash (2003) reported that in 2000, 56% of CBS residents interviewed held multiple parcels of land, usually one parcel for their house and another parcel or more to farm or raise cattle on. The 2010 Belize Population and Household census shows that overall, in the 7 villages that comprise the CBS, 76% of land parcels where houses were located were freehold and 24% were leasehold. Wyman (2008) also reported that the vast majority (81%) of landowners she interviewed had title to the property where there houses were located. No data were available as to the status of other properties.

Transferability of property is possible not only through formal title, but also through a simple application to government for leased land that has been "worked" – cleared for agriculture or livestock, according to a management plan. In this way, "idle" land is able to change hands, at times without the knowledge of the original owner.

Flowers Bank is a unique case. Lands in and around Flowers Bank village are part of the Flowers Bank Estate (FBE). FBE is a titled, one-parcel conveyance of 1010 hectares along five km of the Belize River at Flowers Bank. As Lash (2003) noted:

> *Originally, it was bought from an older and larger private, non-government land holding by 21 co-purchasers. Four of these original owners were alive in 2000, but only one, Mr. Cecil Flowers, resides in Belize. This parcel has yet to be surveyed, divided, and titled to descendents, although residents have knowledge of their acreage due. Because the village of FB consists of only 18 families, almost all village residents have a claim to FBE land. With the security of such a large land holding under title, residents have not concerned themselves with changing the status of the parcel, nor of the changes that dividing it would bring to village life.*

The current distribution of houses in and around the CBS is shown in Figure 5. This map is based on field verification and individual house mapping conducted in 2012-2013. The highest density of home is along the main road passing through Scotland Half Moon, Bermudian Landing, Willows Bank and St. Paul's Village. One of the management strategies is to create a 'residential zone' along these major roads and to encourage home building and development in these areas as opposed to building houses nearer to the Belize River in the riparian zone. Most houses currently are in the more upland 'pine

ridge' areas that have easier access to electricity, transportation and eventually a proposed water system for the Belize River Valley.

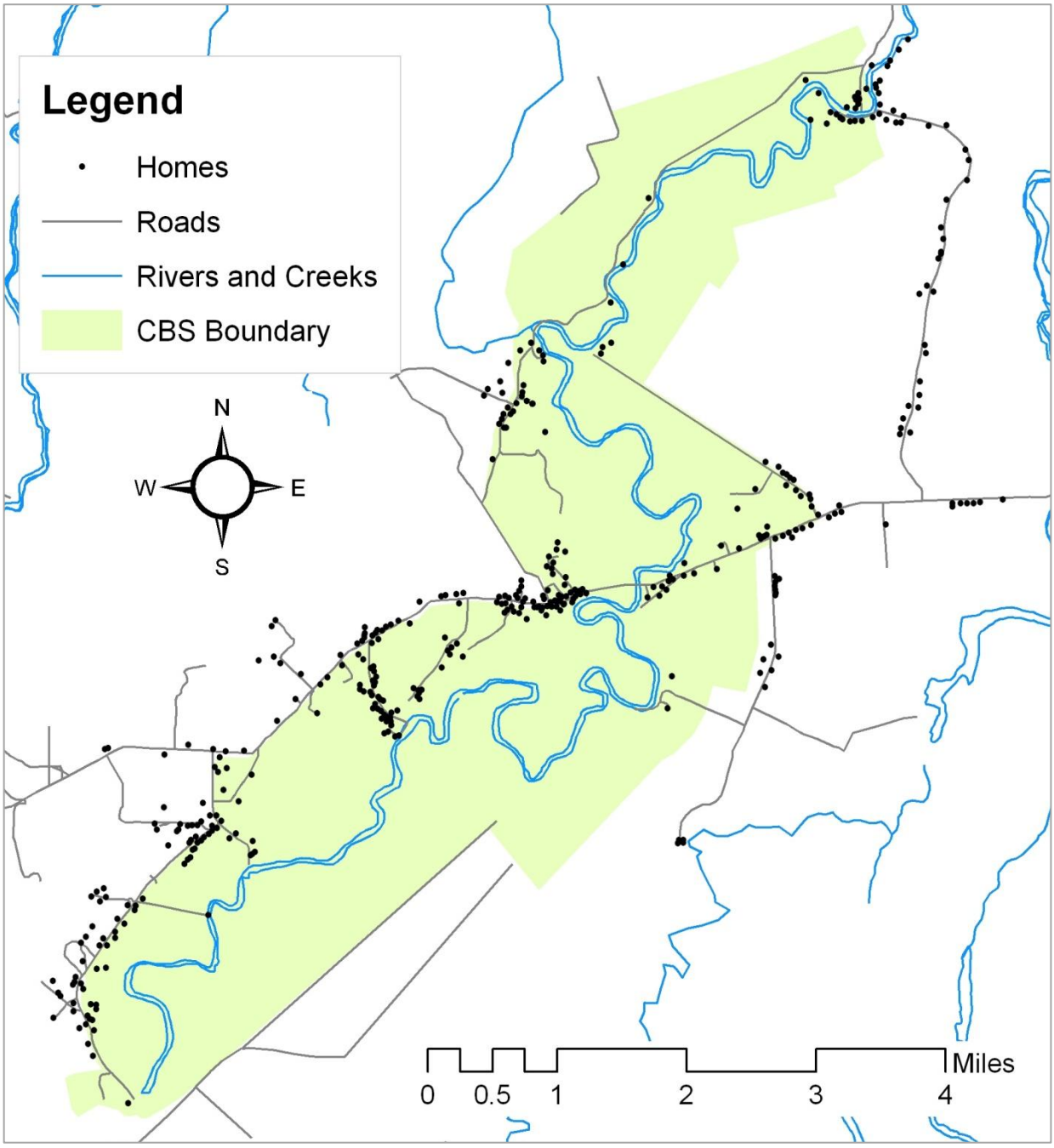


Figure 5. The distribution of homes in and around the CBS in 2012-2013. This map is based on field verification and individual house mapping. The highest density of homes is along the main roads passing through Scotland Half Moon, Bermudian Landing, Double Head Cabbage, Isabella Bank, Willows Bank and St. Paul's Village.

2.3.3 Evaluation of Protected Area

Within the CBS proper, several ecological surveys have been conducted over the past two decades (e.g., Bider 1996; Lyon and Horwich 1996; Silver et al. 1998; Marsh and Loiselle 2003). The biodiversity of the management area is discussed in detail in **Section 2.5**. The CBS' primary importance within Belize's protected areas system is centered on the protection of the black howler monkey (*Alouatta pigra*) and its status as a Community Conserved Area (CCA). The national and regional conservation value of the CBS are discussed below, as are the ecosystem services CBS lands provide.

The CBS is also located very close to both the Spanish Creek Wildlife Sanctuary and the Labouring Creek Jaguar Corridor Wildlife Sanctuary to the west as well as the Mussel Creek drainage to the east. Each of these areas have had both their flora and fauna surveyed (Meerman et al. 2004; BECL 2013; Weyer 1994). Ecological surveys have also been conducted at the Crooked Tree Wildlife Sanctuary to the north (Mackler and Salas 1994). Survey studies have also been conducted in the Rio Bravo Conservation and Management Area to the west and northwest of the CBS (e.g., Iremonger and Brokaw 1995).

National Conservation Value

A National Protected Areas Assessment and Analysis was completed by Meerman (2005) that ranked all existing protected areas in Belize according to biophysical characteristics, land use/management characteristics and a combination of both. Biophysical characteristics assessed the biological, ecological and physical qualities of the protected area and the resulting score reflects the intrinsic biological value of the area. Land use characteristics assessed management and uses of the protected area. The results of that analysis are presented in Table 3.

Table 3. Rank of CBS in NPAPSP ranking system (2005).

Place of the CBS in NPAPSP ranking system Ranking (out of 94)	
Biophysical	82 (7th out of 94)
Land Use - Management	35 (13th out of 94)
Combination	117 (6th out of 94)

Overall, the CBS was ranked in the top 10 of all protected areas in Belize. Management was the lower rank and points to the need for improved management structures and capacity. However, the CBS clearly is an important national conservation area and a unique private protected area in Belize.

Regional Conservation Value

The regional conservation value of the CBS centers on both its riparian forest habitat along the Belize River and a diversity of ecosystems adjacent to the riparian corridor. The CBS has a rich diversity of animal and plant life, including some 200 bird species (Bider 1996), 110 tree species (Lyon and Horwich 1996) and numerous mammal and reptile species (Annex B). Included in the biodiversity of the area are several animal species of concern in Belize.

Species of Concern

Within the CBS, there are also thirty-eight (38) animal species that are listed as species of concern in Belize. These species and their status are listed in Table 4. Included in the list of species of concern are 24 bird species, 10 mammal species and 4 reptile species. To provide a more regional context for these species, Table 4 also includes a listing of species found in the rapid ecological assessments of the Spanish

Creek Wildlife Sanctuary (Meerman et al. 2004) and along Mussel Creek (Weyer 1994). Not surprisingly, due to their close geographic proximity and ecosystem similarities, the three areas share many species of concern.

Table 4. A summary of species of concern found in the CBS and adjacent protected areas.

Order	Species	Common Name	IUCN Class*	Status in Belize*	CBS	SCWS	MC
Bird	*Ajaia ajaja*	Roseate Spoonbill		VU	x		x
Bird	*Amazona xantholora*	Yellow-Lored Parrot		VU	x		x
Bird	*Ardea Herodias*	Great Blue Heron		VU	x	x	x
Bird	*Cairina moschata*	Muscovy Duck		VU	x	x	x
Bird	*Crax rubra*	Great Curassow	NT	VU	x		x
Bird	*Dendrocygna autumnalis*	Black-Bellied Whistling Duck		VU	x	x	x
Bird	*Dendroica cerulea*	Cerulean Warbler	VU	VU	x	x	
Bird	*Egretta thula*	Snowy Egret		VU	x	x	x
Bird	*Egretta tricolor*	Tricolored Heron		VU	x	x	x
Bird	*Eudocimus albus*	White Ibis		VU	x	x	x
Bird	*Fregata magnificens*	Magnificent Frigatebird		VU	x	x	x
Bird	*Jabiru mycteria*	Jabiru		VU	x	x	x
Bird	*Laterallus jamaicensis*	Black Rail	NT	DD	x	x	x
Bird	*Melanoptila glabrirostris*	Black Catbird	NT	NT	x		x
Bird	*Meleagris ocellata*	Ocellated Turkey	NT	VU	x	x	x
Bird	*Mycteria americana*	Wood Stork		VU	x	x	x
Bird	*Nyctanassa violacea*	Yellow-Crowned Night-Heron		VU	x	x	x
Bird	*Nycticorax nycticorax*	Black-Crowned Night-Heron		VU	x	x	x
Bird	*Pelecanus occidentalis*	Brown Pelican		VU		x	
Bird	*Penelope purpurascens*	Crested Guan		VU	x	x	
Bird	*Phalacrocorax brasilianus*	Neotropic Cormorant		VU	x	x	x
Bird	*Pionopsitta haematotis*	Brown-Hooded Parrot		DD	x	x	x
Bird	*Sarcoramphus papa*	King Vulture		VU	x	x	x
Mammal	*Alouatta pigra*	Mexican Black Howler Monkey	EN	VU	x	x	x
Mammal	*Ateles geoffroyi*	Central American Spider Monkey	VU	VU		x	
Mammal	*Balantiopteryx io*	Thomas's Sac-winged Bat	EN	VU	x		x
Mammal	*Herpailurus yaguarondi*	Yaguarundi	VU	LC	x	x	x
Mammal	*Leopardus pardalis*	Ocelot	VU	VU	x	x	x
Mammal	*Leopardus wiedii*	Margay	VU	VU	x	x	x
Mammal	*Lontra longicaudis*	Neotropical River Otter	DD	VU	x	x	x
Mammal	*Mazama pandora*	Yucatan Brown Brocket Deer	DD	DD	x	x	x
Mammal	*Panthera onca*	Jaguar	NT	NT	x	x	x
Mammal	*Tapirus bairdii*	Central American Tapir	EN	VU	x	x	x
Mammal	*Trichechus manatus*	West Indian Manatee	VU	VU	x	x	x
Reptile	*Crocodylus moreletii*	Morelet's Crocodile		CD	x	x	x
Reptile	*Dermatemys mawii*	Central American River Turtle	EN	EN	x	x	x
Reptile	*Staurotypus triporcatus*	Mexican Musk Turtle	NT	NT	x	x	
Reptile	*Trachemys scripta*	Common Slider	NT	LC	x	x	x

*The category codes are summarized on the following page.

Categories and codes applied in the IUCN Red Data List and Status in Belize columns in Table 4.

EXTINCT (EX) - A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), and throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

EXTINCT IN THE WILD (EW) - A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual) throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR) - A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.

ENDANGERED (EN) - A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU) - A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.

NEAR THREATENED (NT) - A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC) - A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

CONSERVATION DEPENDENT (CD) - Taxa that are the focus of a continuing taxon- specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.

DATA DEFICIENT (DD) - A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.

Connectivity and Corridors

As noted in **Section 2.3**, the CBS is located along both the *Maya Mountains to Crooked Tree Corridor* as well as the *Shipstern to Crooked Tree Biological Corridor*. The CBS thus represents an important geographic location in the Northern Lowlands that if managed effectively, can enhance the integrity of both Corridors. Recognizing and more importantly working with regional stakeholders to protect and enhance this connectivity is an important new management objective for the CBS.

The Northern Belize Biological Corridor project aims to secure long-term conservation of biodiversity of global importance in the “Maya Lowlands” of north-eastern Central America by maintaining ecological linkages between protected areas across northern Belize, from northern Belize to the Maya

Mountain/Mountain Pine Ridge massif in central Belize, and from northern Belize into the Maya and Calakmul Biosphere Reserves in Guatemala and Mexico, respectively (Meerman et al. 2000). The proposed corridors constitute a critical link in the Mesoamerican Biological Corridor (MBC) system (see **Section 2.3**). The MBC is comprised of a mosaic of large and small private land-holdings with a relatively low proportion of national lands. The CBS is part of this corridor complex.

Ecosystem Services

The lands that comprise the CBS and lands adjacent to the CBS provide a range of valuable ecosystem services (Table 5). Ecosystem services are classified into four major categories. Maintaining these important ecosystem services is linked to protecting forest cover, aquatic ecosystems and reducing those negative impacts of agricultural clearings in and around the CBS.

Table 5. Ecosystem services provided by lands that comprise the CBS.

Ecosystem Services provided by CBS Lands	
Provisioning The goods or products obtained from ecosystems	• Soils provide cultivated plants or agricultural produce harvested for food • Cleared forests used for rearing domestic livestock • Forests provide wild food/fruit source and medicines • Belize River provides source of wild fish for consumption • Source of biological raw materials for housing and other uses • Source of wood for fuel • Source of water for humans and domestic livestock
Regulation The benefits obtained from an ecosystem's control of natural processes	• Regulation of water flow and flooding • Controlling soil erosion • Flooding provides flush of new nutrients • Regulation of micro-climates
Cultural The non-material benefits obtained from ecosystems	• The CBS is an important area for tourism and recreation • Provides a natural 'classroom' for exploring nature • Supports the village lifestyle of living close to nature
Supporting The natural processes that maintain the other ecosystem services	• The riparian forests support natural nutrient cycling • Riparian forests support important wildlife habitat • Riparian forests help protect aquatic species by providing shade and food • CBS lands as a whole function as wildlife corridors for mobile species

All the terrestrial and aquatic ecosystem types in the CBS are providing ecosystem services. Riparian forests in particular provide a range of important services (Naiman et al. 2005), such as filtering excess nutrients and sediment from agricultural runoff (Lowrance et al. 1984), protecting against flooding and stream bank erosion (Sweeney et al. 2007), and ameliorating the effects of pesticides and protecting water quality (Lowrance et al. 1985). In addition, all the terrestrial and aquatic ecosystems provide habitat for both protected and hunted game species that support local food webs and provide food for local households. In addition, riparian forests provide shade for rivers that can optimize light and moderate water temperature for aquatic plants and animals (Theurer et al. 1985; Tabacchi et al. 2000).

2.3.4 Socio-Economic Context

The national economic context was summarized in the 2012 Belize National Sustainable Development Report:

> *Belize is a small open economy supported primarily by its natural resource base. Belize's GDP per capita grew by 36% over the past 10 years: 1999 (USD $3,045.6) to 2010 (USD $4,153). However, it remains one of the less developed of the Caribbean nations (IDB 2010). Exports account for 60 percent of GDP (estimated in 2010 US$ 1,401 millions). The tertiary sector, or service industry, provides almost two thirds of all jobs in Belize and the retail sector provides a fifth of all jobs (CPA). Debt service represents almost 10% of exports and the total public debt burden remaining at close to 80 percent of GDP by the end of 2010. Poverty level for Belizeans in 2009 was 41.3%, a burden that falls unequally on children, who experience a poverty rate of 50%.*

The 2010 Census showed that Belize had a population of 312,698 and an average population growth rate of 2.65%. Compared to 2000, there was a 37% increase in the rural population. A summary and comparison of population and housing trends in the CBS, Belize Rural and the nation as a whole are shown in Table 6. The population increase in CBS villages was 14.3% between 2000 and 2010 and the number of dwelling units increased 11.1%. Both these values were well below the national and Belize Rural values. The average household size also increased slightly from 2000 to 2010 in the CBS villages (2.9%) corresponding to an increase of 4.58 to 4.69 persons per household over the 10 year period.

Table 6. A summary and comparison of population and housing trends in the CBS, Belize Rural and the nation as a whole.

Population and Housing Trends from 2000 to 2010			
Parameter	National	Belize Rural	CBS Villages
Population increase	+ 30.2%	+65.2	+14.3
Dwelling units	+46.0%	-	+11.1
Household size	-	-	+2.9

The population and number of households per village were also analyzed. Table 7 shows a comparison of population and number of households from 1992 to 2010 and population from 2000 to 2010 in the CBS and surrounding villages.

In 1992, 216 total occupied houses were mapped in the seven CBS villages (Bruner 1993); by 2000 there were a total of 301 occupied houses, an increase of 39%. In the 2010 census, there were 310 total occupied houses, representing a 2.99% increase from 2000 and a 43.52% increase from 1992.

It should be noted that residents of Big Falls moved from the riverside to the pine ridge areas in St. Paul's in the late 1980's and by 2000 the village of Big Falls no longer existed as a separate entity and was merged with St. Paul's.

Table 7. A comparison of population and number of households from 1992 to 2010 and population in 2000 to 2010 in the CBS and surrounding villages.

Village Name	Pop 2000	Pop 2010	Number of Households 1992*	Number of Households 2000**	Number of Households 2010
Villages Comprising the CBS					
Flowers Bank	98	122	17	20	31
Isabella Bank	124	143	23	27	29
Bermudian Landing	191	183	32	42	37
Scotland Half Moon	72	260	24	19	57
Double Head Cabbage	361	407	54	76	84
Willows Bank	156	185	31	36	38
St. Paul's Bank/Big Falls	269	153	23	59	34
Villages Adjacent to CHBS					
Rancho Dolores	171	219	-	36	43
Lemonal	na	169	-	-	37
May Pen	59	-	-	8	-
Burrell Boom	1,074	2,222	-	247	434

* Based on Lash (1993)

** Based on 2000 Belize Census

It should be noted that while Kriol is the primary ethnic group in each village, there are other ethnic/national groups in some of these villages, including Mestizos, Mennonites, Chinese and Americans.

The poverty map for Belize (CACHR 2008) was used to assess household income at the village level. The poverty map shows the percentage of households in each village below the poverty line. The poverty line is based on household income compared to the official poverty line by District. Table 8 shows an estimate of the households below the poverty line in the Belize River Valley.

Table 8. A summary of household poverty in CBS villages.

Village	Households Below Poverty Line
Bermudian Landing	moderate (50-74%)
Double Head Cabbage	low (25-49%)
Flowers Bank	moderate (50-74%)
Isabella Bank	low (25-49%)
Lemonal	na
Rancho Dolores	very low (0 – 24%)
Scotland Half Moon	na
St. Paul's Bank/Big Falls	low (25-49%)
Willows Bank	very low (0-24%)

Based on the 2010 census results, the unemployment rate in the Belize District was 22.7%.

Main Income Generating Activities

The main livelihood activities of the CBS villages include: small-scale agriculture (milpa or plantation farming); small-scale cattle rearing; employment with nature-based tourism (primarily in the village of Bermudian Landing); small-scale coconut oil and cohune nut oil (*Attalea cohune*) production; cashew and cashew product sales; and outside wage employment (primarily in or around Belize City).

Wyman (2008) in a broad survey of 135 households in the CBS reported the following key results:

- There are several households in each village that have over 50 head of cattle but many residents have a few head of cattle that serve as a form of bank account in many ways; if someone is sick or another occasion to need cash presents itself, a cow can immediately be sold
- 63% of households had at least one family member who works outside of the CBS. The road that crosses through four of the seven villages was paved in 2003 and has increased bus service with access to 6 of the 7 villages several times daily (Monday through Friday) to Belize City in the mornings and returning to the CBS villages in the evening (approximately a 35 mile / 56 km commute)
- 33% of the households received remittances from family members who have left and live and work in the U.S. Remittances totaled $95,850 BZE (approx US $ 47,925) over the course of one year, accounting for 28.5% of their total income
- Of the 33% of households receiving remittances (45 households total), 11 households reported remittances as the only source of monetary income.

Stakeholders

In addition to the villages comprising the Sanctuary, there are many other stakeholders related to the management objectives and operations of the CBS and that can directly or indirectly influence management of the CBS or be influenced by the management of the CBS. Table 9 provides a list of stakeholders, the impacts of the stakeholder on the CBS and the impacts of the CBS on the stakeholder.

Cultural Day celebration at the CBS.

Table 9. A List of stakeholders and a summary of both their impacts on CBS management and CBS impacts on the stakeholder. A summary of which of the five focal areas under the CBS mission each stakeholder falls under is also noted.

Management Area and Stakeholders	Focal Areas*	Impact of Stakeholder on CBS	Impact of CBS on Stakeholder
Area Village Councils	**C,T,D,E**	• Village-level influence on all CBS programmes	• Influence on regional planning efforts
Association of Protected Areas Management Organization (APAMO)	**M**	• Aid in building CBS capacity and linkage with Protected Area community	• CBS can provide leadership on Community Conserved Area operations
Belize and Beyond – Scotland Half Moon	**T**	• Potentially competitive tourism operation in the CBS	• Potentially competitive tourism operation in CBS • Influence to join regional tourism planning
Belize River Rafting Trips (Willows Bank)	**T**	• Potentially competitive tourism operation in the CBS • Potential enhancement of tourist traffic to region	• Potentially competitive tourism operation in CBS • Influence to join regional tourism planning • Increase tourist traffic through presence of CBS
Belize Rural High School	**D,E**	• The areas only regional high school • Individual requests for financial assistance • Serve as a means of disseminating information between CBS and villages	• Potential education partnership • Offer educational programming
Belize Rural Primary School	**D,E**	• Regional amalgamated primary school and potential education partner	• Potential education partnership • Offer educational programming
Belize Tourism Industry Association (BTIA)	**T**	• Provides a national tourism organization connection that puts CBS in a national context • Support the mission of the CBS	• Benefit from having CBS as a tourism venue, attracting visitors to Belize and the CBS area
Belize Tourist Board (BTB)	**T**	• Provides a national tourism organization connection that puts CBS in a national context • Support the mission of the CBS	• Benefit from having CBS as a tourism venue, attracting visitors to Belize and the CBS area
Belizean Tour Operators (Belize City)	**T**	• Regulation of tourist traffic to CBS • Provide marketing at a national level and send visitors to CBS • Connection with international tourism operations	• Influence tourist traffic by providing tourist experiences and packages • Benefit from having CBS as a destination for eco-cultural tourism • Income generation from using CBS for tourism
Black Orchid Resort/ Belize R Us – Burrell Boom	**T**	• Regional tourism operator • Potentially competitive tourism operation in region • Provide marketing at a regional level and sends visitors to CBS	• Potentially competitive tourism operation in region • Influence to join regional tourism planning
Cattle Slaughterhouse Facility (Willows Bank)	**D**	• Business operation within the CBS • Free range cattle discussion influence	• Zoning of CBS area lands includes consideration of cattle operations

Management Area and Stakeholders	Focal Areas*	Stakeholder Impact on CBS	CBS Impact on Stakeholder
CBSWCG	**M,C,R,T, D,E**	• Main conduit and point of contact for all individual, community, CBS, business and regional stakeholders	• CBS mission, focal areas and management planning influence regional conservation, eco-cultural tourism, community development and education
Chris Salas - Salas Bamboo (Isabella Bank)	**D**	• Business operation within the CBS • Local cottage industry	• Highlight products at CBS Museum gift shop • Offer potential markets for products
Cohune Processing Facility – Flowers Bank	**C,D**	• Business operation within the CBS • Local cottage industry	• Highlight products at CBS Museum gift shop • Offer potential markets for products
Crooked Tree Wildlife Sanctuary (CTWS)	**C,R,T,E**	• Established protected area with tourism and community development programmes • Share and support conservation mission • Potential tourism competitor with CBS in region	• Encourage CTWS to enter into regional corridor partnership • Potential tourism competitor with CTWS in region • Share and support conservation mission
Cruise Ship Companies	**T**	• Main avenue for tourist entry into Belize • Demand specific amenities for tourists • Provide marketing at an international level, and send visitors to the CBS	• Provide unique community based tourism experience • Provide opportunity to see black howler monkeys • Income generation based on CBS venues
Dauntless Designers – Double Head Cabbage	**D**	• Business operation within the CBS • Local cottage industry	• Highlight products at CBS Museum gift shop • Offer potential markets for products • Provide mentoring, assistance and capacity building • Integrate regional development
Double Head Cabbage Cattlemen's Cooperative	**C,D**	• Pasture clearing impacts CBS management planning • Potential community development area	• Partner in free range cattle debate • CBS landholder management plans alter land clearing practices
EcoLution Tours (Shane Baizar)	**T,D**	• Potentially competitive tourism operation in the CBS • Potential enhancement of tourist traffic to region	• Potentially competitive tourism operation in CBS • Influence to join regional tourism planning • Increase tourist traffic through presence of CBS
Flowers Bank Community Group	**C,T,D**	• Enhance the community development mission of the CBS	• Provide mentoring, assistance and capacity building • Integrate regional development
Forest Department	**C,R**	• Oversight of protected areas in Belize under the NPASP and enforcement of legal violations	• Political support • Provides a unique community governance model

Management Area and Stakeholders	Focal Areas*	Stakeholder Impact on CBS	CBS Impact on Stakeholder
Labouring Creek Jaguar Corridor Wildlife Sanctuary (LCJCWS)	**C,R**	• Share and support conservation mission • Provide linkage with northern biological corridor	• Increase visibility of LCJCWS by presence of CBS • Potential tourism competitor with CTWS in region • Share and support conservation mission
Ministry of Human Development	**M**	• GOB oversight of CBS finances and CBS has NGO status	• CBS acting as conduit for area CBOs
Ministry of Rural Development	**D**	• Provide development opportunities for region	• CBS programmes provide models for future work
Programme for Belize	**C,R,T,E**	• A regional conservation partner • Share and support conservation mission	• Share and support conservation mission
Protected Areas Conservation Trust (PACT)	**M,C,R,T, D,E**	• Aid in building CBS capacity • Source of funding	• Share and support conservation mission
Spanish Creek Wildlife Sanctuary (SCWS)	**C,R.T,E**	• Recently established protected area with some tourist programmes • Share and support conservation mission • Potential tourism competitor with CBS in region	• Increase visibility of SCWS by presence of CBS • Increase tourist traffic to the region • Potential tourism competitor with SCWS in region • Share and support conservation mission
University of Belize	**C,R**	• Support the mission of CBS • Provide conservation and scientific research capacity	• CBS provides a potential study area for faculty and students
Village Bed and Breakfast Providers	**T**	• Provide unique cultural experience for tourists • Regulate the level of home stay tourism • Potential increase in money spent at the CBS	• Benefit from the presence of the CBS in the community • Benefit from the CBS mission and programmes • Provides income to participants in home stay programme
Village Landholders	**C,T,D,E**	• The individual landholding remains the basic management unit for CBS conservation efforts	• Increased tourism potential and marketing ability • Potential changes in traditional hunting practices

* C- Conservation; R – Research; T - Eco-Cultural Tourism; D – Community Development; E – Education; M - Management

2.4 Physical Environment of Management Area

2.4.1 Climate

The climate of Belize is influenced by three larger climatic systems: (1) the Caribbean and Atlantic Ocean to the east; (2) the Pacific from the west; and (3) continental North America (Wright 2005). The climate of the CBS is typical for north-central Belize and is considered subtropical, outer-tropical or peritropical. Figure 6 shows a map of annual rainfall patterns across Belize. The CBS is in the 60 to 80", and 80 to 100" categories. However, there are distinct rainy and dry seasons in the CBS. Throughout Belize there is a pronounced dry season from February through May, but rainfall can vary dramatically between years and between months.

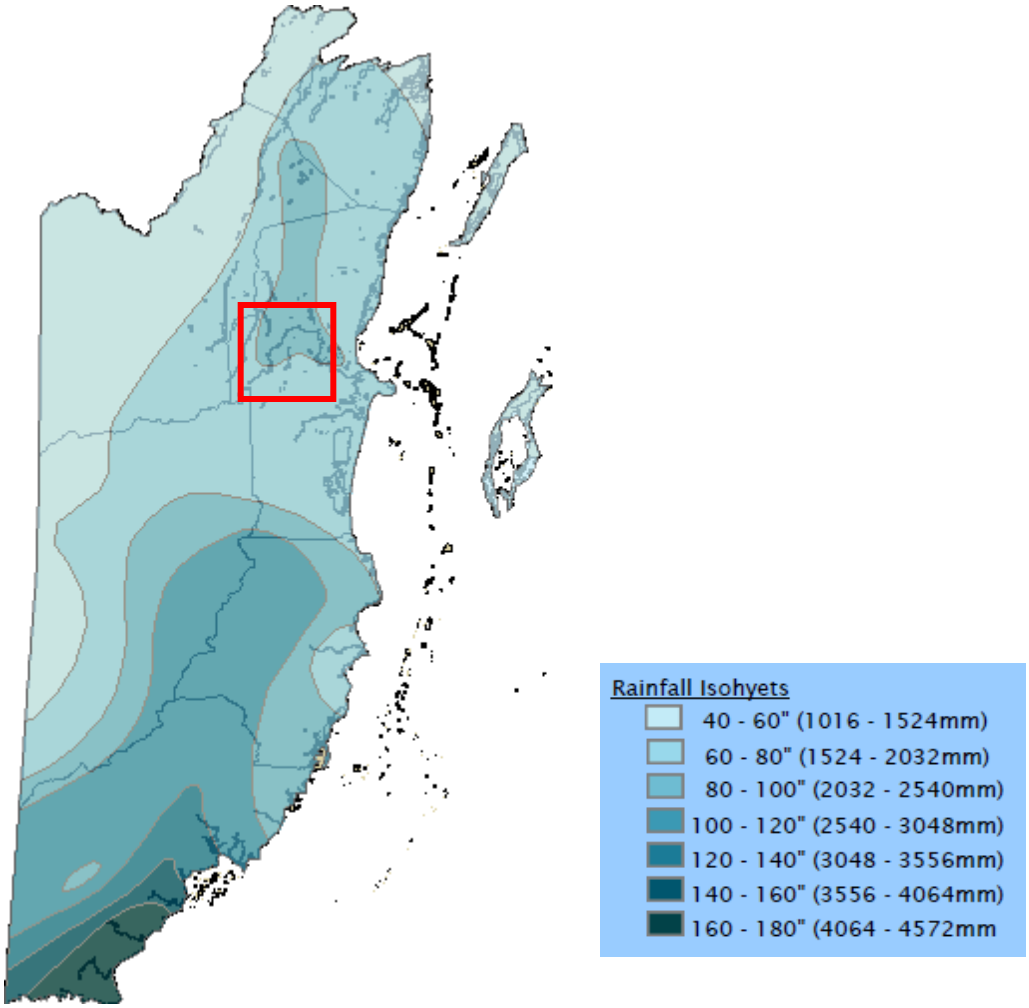


Figure 6. Annual rainfall across Belize.

Figure 7 shows a summary of monthly temperatures, rainfall, relative humidity and wet days at the Philip S.W. Goldson International Airport, in Ladyville, Belize District, approximately 14 miles east of the CBS.

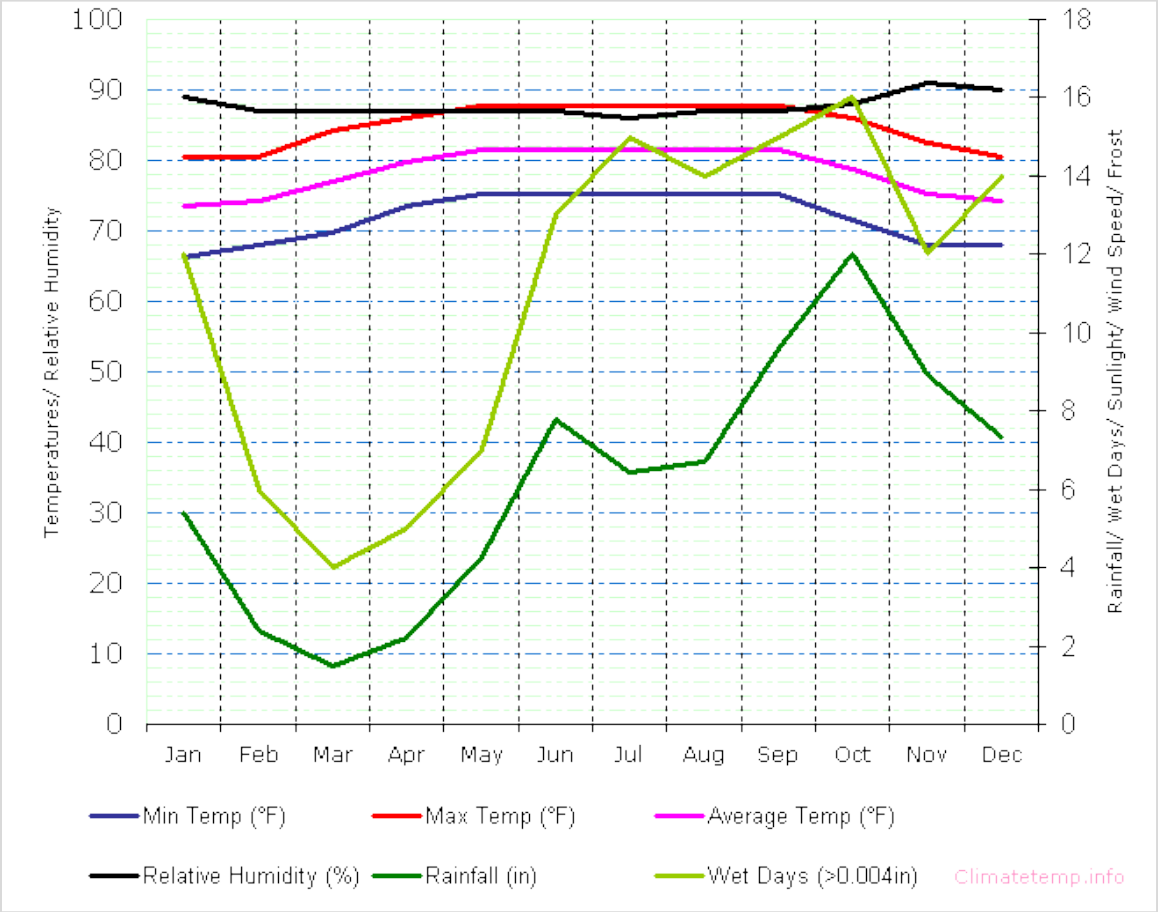


Figure 7. A summary of monthly temperatures, rainfall, relative humidity and wet days at the Philip S.W. Goldson International Airport.

2.4.2 Geology

The CBS is located in the southern portion of the northern coastal plain of Belize. The northern coastal plain is underlain by the Yucatan Carbonate Platform. This is a stable region with gently dipping beds of limestone, chalk, marl and other sedimentary layers (Hartshorn et al. 1984). The northern half of Belize consists of heterogeneous sediments deposited on the Yucatan platform. Limestone and sediments derived from limestone are the dominant geologic features.

There are no published geological studies that deal specifically with the CBS per se. The geological setting and general stratigraphy of Belize have been summarized most recently by Lara (1993), Purdy et al. (2003) and King et al. (2004). Other general information can be found from the overview geological map of Belize (Cornec, 1985, 1986, 2002) and the study by King et al. (1992).

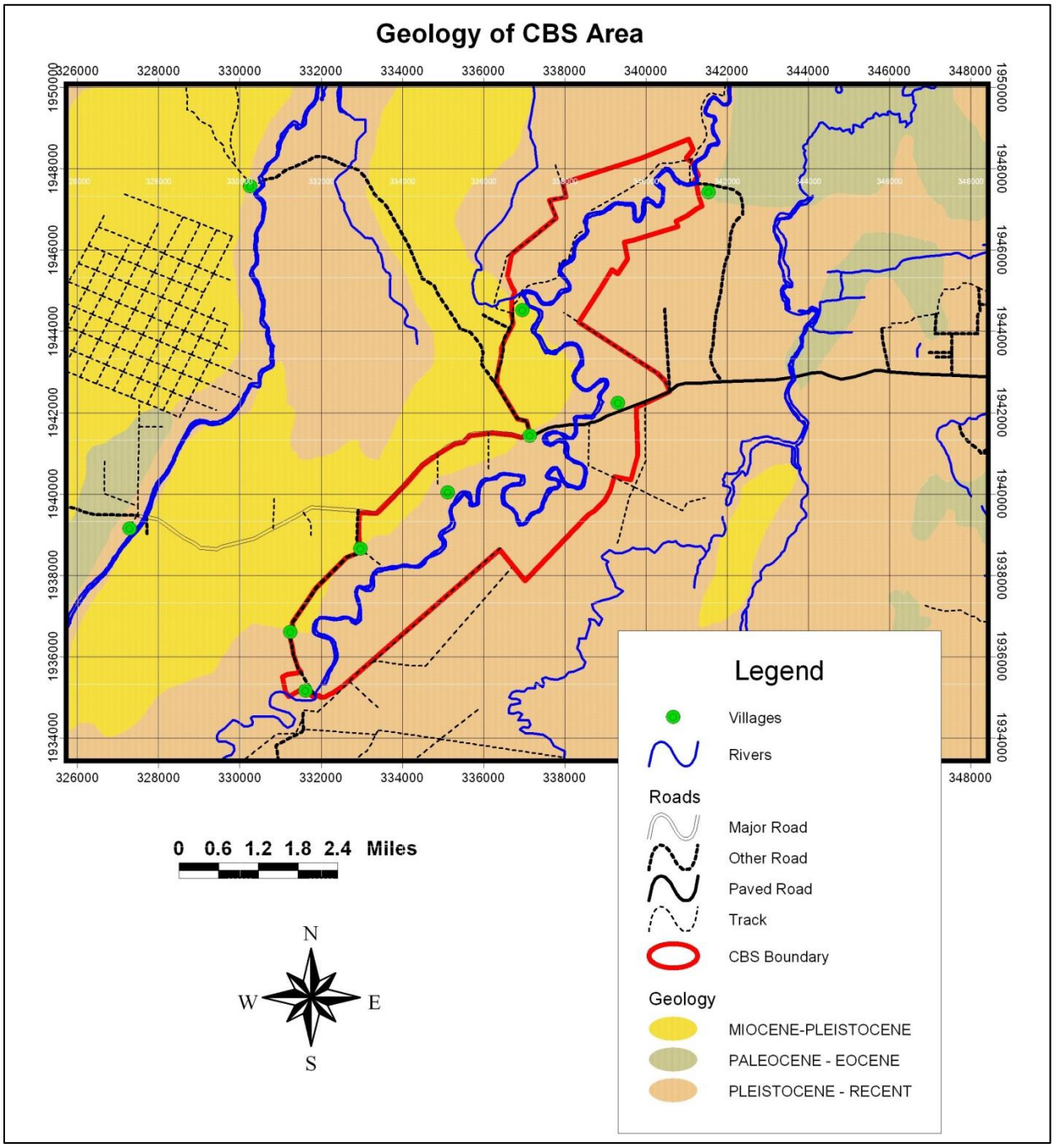


Figure 8. A map of the general underlying geology of the CBS (based on Cornec 2002).

The major underlying geological formation of the CBS is recent Pleistocene deposits (2.5 million to 11,700 years ago) (Figure 8). These are found in the lower lying regions of the CBS. In the higher elevation savannas (pine ridge) there are Miocene-Pleistocene Deposits (23.03 million to 11,700 years ago).

Fault Lines

There are several fault lines that run through and around the CBS. These are shown in Figure 9 and are from Purdy et al. (2003).

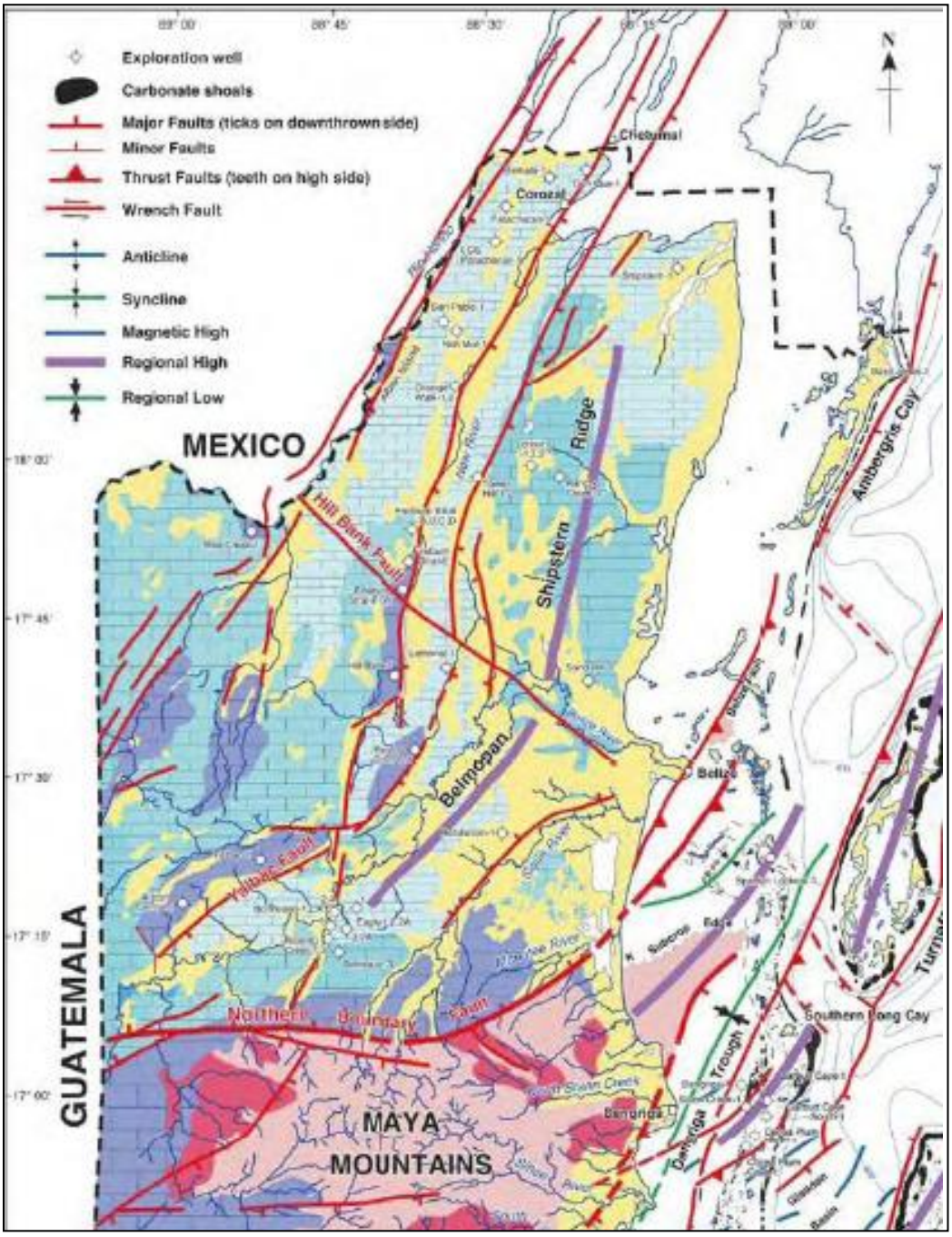


Figure 9. Major fault lines in northern Belize (Purdy et al. 2003).

Land Systems and Sub Units

Following after King et al. (1992) the major land systems in the CBS are the Lower Belize Floodplains. In these flat floodplain areas there are often swampy lands between the river edge and the upper floodplain edge. This land system is comprised of several subunits in the CBS, including:

- High floodplain bench (BF h)
- Low floodplain bench backland (BF lb)
- Low floodplain bench (BF l)
- Alluvial wash (BF W)
- Gypsic high floodplain bench (BF g) [contains gypsum]

The land systems and subunits found in the CBS area are shown in Figure 10.

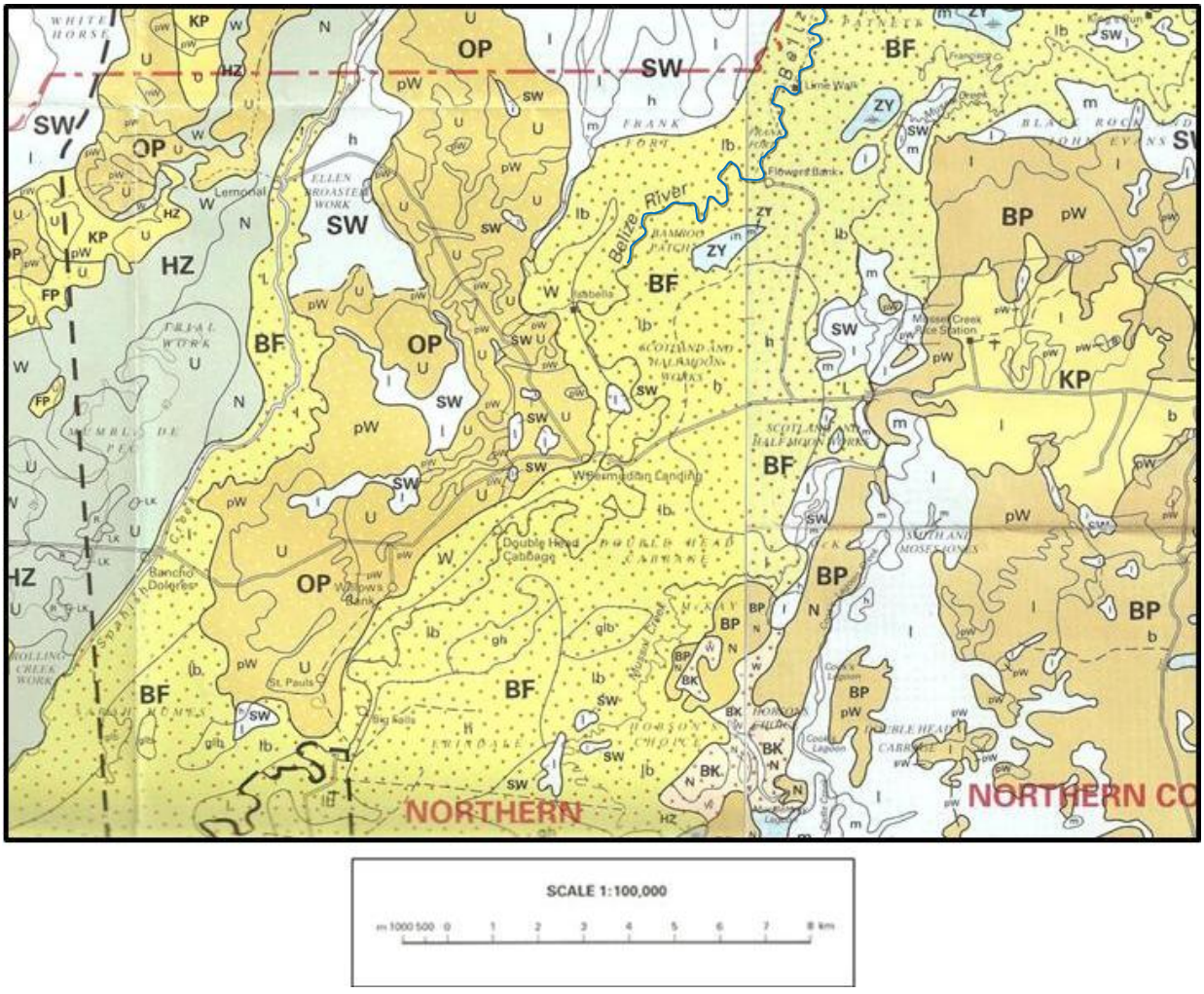


Figure 10. Land systems and sub-units found in and around the CBS (after King et al. 1992).

Immediate adjacent (on both banks) of the Belize River, the low floodplain bench (l) is the most common sub unit. Running parallel to the western bank of the River is the alluvial wash subunit (W). The latter occurs on higher elevations from Isabella Bank to St. Paul's Bank and is a transition subunit to the August Pine Plain (OP) land unit that is associated with savanna soils and vegetation.

There are also pockets of the Sibal Swamps (SW) land unit adjacent to CBS lands, especially in the north moving towards the Crooked Tree Wildlife Sanctuary.

2.4.3 Soils

King et al. (1992) provides general information on the soils, the underlying geological formations and the general evolution of landforms in Northern Belize. Information on soils in the CBS region largely comes from the assessment of northern Belize by King et al. (1992). The riparian areas are clearly alluvial soils that experience regular flooding in the rainy season and especially during large storm events (including tropical depressions, storms and hurricanes).

Soils in the Lower Belize Floodplains (BF) land unit are primarily ***alluvium*** and the main soil type in the Melinda Series. These soils occur on flat areas, are well or moderately drained and support high broadleaf forests and cohune ridge (*Attalea cohune* dominated forests). Quamina subsuite soils are found on floodplain bench and terrace areas and are a mixed calcareous and siliceous alluvium.

Soils in the CBS are clearly linked to the geomorphology and geology of the Belize River Valley. In low terrain positions there are typically two soil groups: young alluvial Fluvisols that show stratification from recent sedimentation; and non-stratified Gleysols in water saturated areas.

Fluvisols are genetically young, azonal and highly variable depending on parent material. Technically, they are soils with a thickness of 25 cm or more, have fluvic material within 25 cm of the soil surface and extending to at least 50 cm in depth and soils that have no clear diagnostic horizons.

The formation of Gleysols is conditioned by excessive water at shallow depth (less than 50 cm from the soil surface) in some period of the year or throughout the year. The permanently saturated subsoil layers develop 'gleying' and as such, have neutral whitish/greyish or blueish to greenish matrix colors and this gleying extends within 50 cm of the soil surface.

Vertisols are soils whose clay mineral fraction is dominated by montmorillonite. This, in part, gives the soils a high cation-exchange-capacity that is typically saturated with calcium (CA^{2+}) and Mg^{2+}) especially in limestone rich areas. They do have a propensity to swell and shrink during wet and dry periods, respectively, that can make them unstable for some agricultural activities. These soils are also typically found in areas of low-lying topography.

<u>Quamina Subsuite</u>
King et al. (1992) note the soils of Quamina Subsuite (Fluvisol; Fluvent) are morphologically very similar to those of Monkey River Subsuite in their grey and brown colors, textural range and layering, and high silt and muscovite contents. They are also young soils developed in recent alluvium and occur in floodplain deposits. They differ in that the alluvium is of mixed siliceous and calcareous origins, or it is mainly siliceous but is regularly inundated and suffused with hard water from calcareous catchments. The result is that the soils have higher pH and exchangeable bases, especially Ca and Mg, than the Monkey River soils.

2.4.4 Hydrology

CBS lands are entirely within the Belize River watershed. It is the largest watershed in Belize and includes portions of eastern Guatemala. In Belize, the main tributaries include the Mopan River, Macal River, Roaring River, White Water Lagoon, Crooked Tree Lagoons and Black Creek. Overall, the watershed is some 3,290 mi^2 (8,521 km^2) with approximately 30% of the watershed in Guatemala. Figure 11 shows the extent of the Belize River watershed.

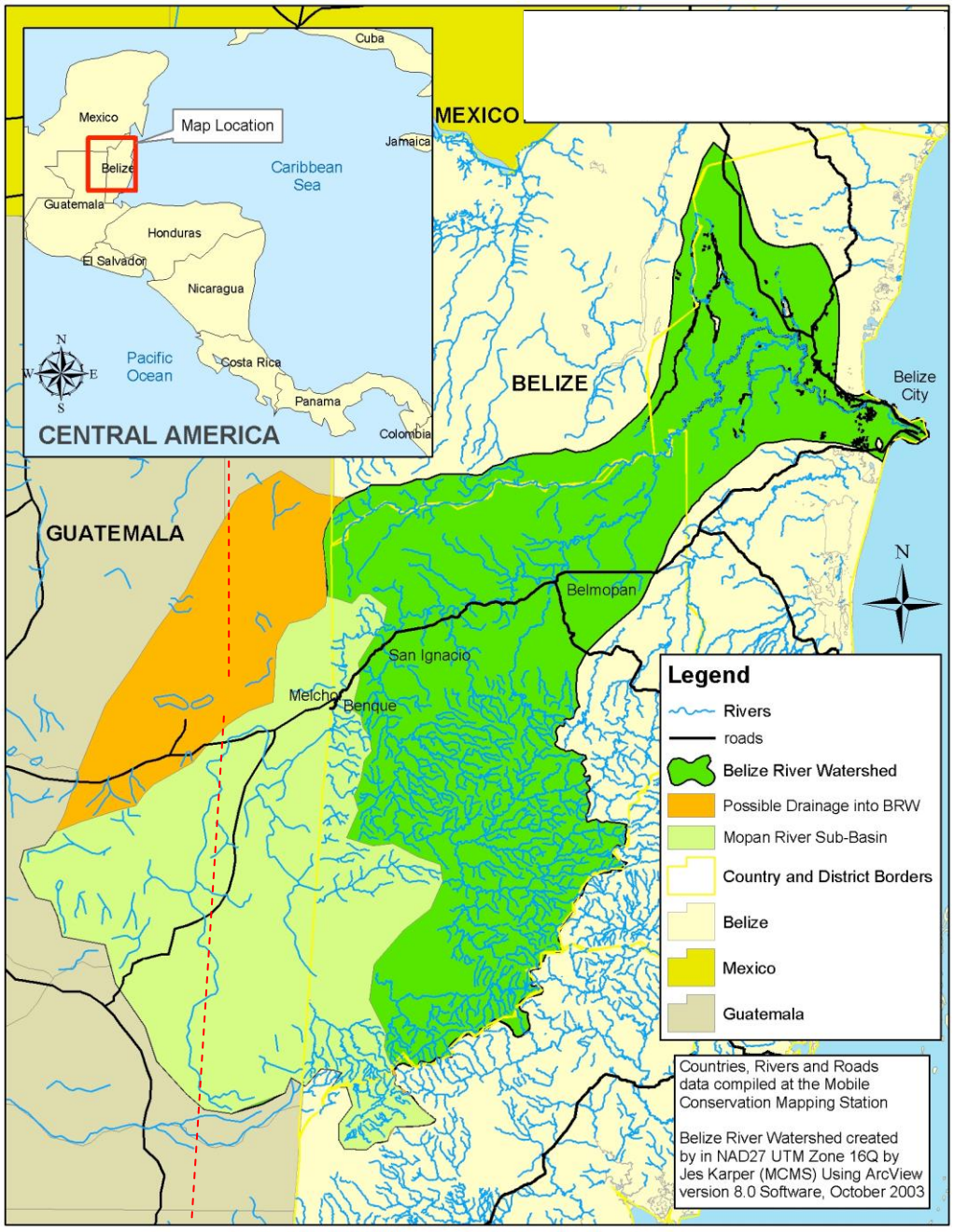


Figure 11. The Belize River watershed (from Kasper and Boles 2004).

Boles (1999) identifies 16 principal watersheds that were grouped into six main watershed regions based on general characteristics of topography, geology, soils, rainfall and land use. He defines a watershed region as a cluster of watersheds that share many structural, climatic and often impact characteristics. The CBS is located in watershed Region 9. From a sub-catchment perspective, the CBS is located in the Eastern Belize sub-watershed as shown in Figure 12. Lands along the Belize River in CBS are clearly impacted by what occurs upstream in the watershed (Kasper and Boles 2004).

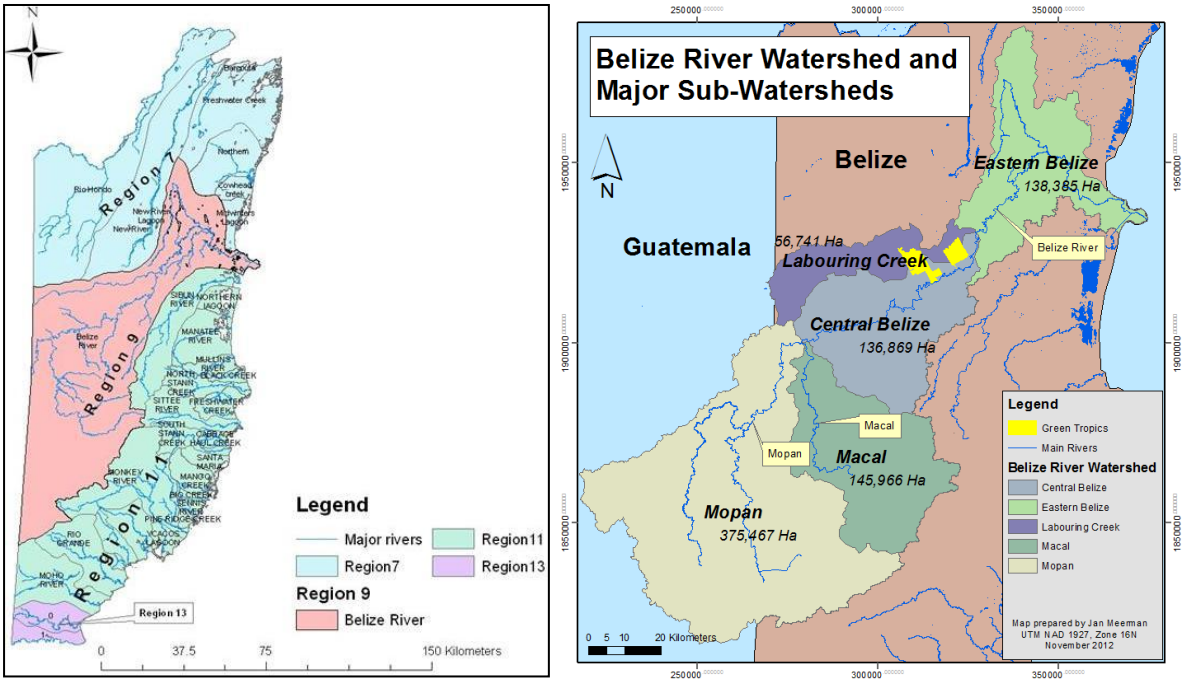


Figure 12. Main watershed regions in Belize after Boles (1999) on left; on right, major sub-watersheds in the Belize River watershed.

The river is characterized by wide variation in flow ranging from less than 20 m^3/sec (~317,000 gallons per minute) during the dry season low flows, and exceeding 400 m^3/sec (6,340,800 gallons per minute) during annual floods. The full hydrology of the Belize River is not well understood. There are three hydrological stations along the Belize River: Banana Bank, Big Falls Ranch and Double Run. Mean, minimum and maximum flows estimated at Big Falls Ranch by the Belize National Meteorological Service are shown below.

Belize River Flow at Big Falls Ranch, Belize District.
Stream flow calculated from manually read water levels [m3/sec]

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
Mean	144	114	97.6	86.2	82.1	123	147	150	164	215	190	160	**139**
Max	366	267	182	169	318	373	394	400	376	386	398	406	**336**
YEAR	1988	1990	1990	1988	1986	1990	1990	1993	1995	1988	1990	1991	
Min	37.8	20.4	20.4	5.83	16.3	16.3	27.5	35.9	19.0	57.6	37.8	41.6	**28**
YEAR	1982	2004	2004	2000	1983	1983	2001	2001	2003	1990	1987	1982	

The hydrology of the Belize River from its confluence with Labouring Creek to the Black Creek confluence is complicated and linked to Spanish Creek and the Crooked Tree lagoon system. The following excerpt highlights this complexity; it is taken from the 2011 Flood Mitigation Study (VIU 2011).

> *The Belize River has a low-lying floodplain that frequently floods in the rainy season. The hydrology of the basin is extremely complex. The upper watershed includes the Maya Mountains as well as settled lowlands and rolling hills of the Cayo District of Belize and a large area of Guatemala. Dams on the Macal River, a tributary to the Belize River, provide hydroelectric power to Belize and some stream regulation. The timing and extent of flood flows along the Belize River depend on where the rains fall and the time required for the river to drain the valley. If rains concentrate in the upper watershed, some delay occurs before floodwaters reach the [Belize River Valley]. The basin is also a somewhat open system. The valley lies on a limestone Karst base, and floodwaters can be fed by underground flows. Further, when waters begin to overflow the banks, they can traverse into other watersheds, such as the Spanish Creek watershed. From here, the waters flow into a complex of lagoons and marshes that include the Crooked Tree Wildlife Sanctuary. From here, the waters can flow into New River Lagoon and New River, and cause flooding in the far north of the country. The water also returns to the Belize River through Black Creek downstream of the village of May Pen. Complicating the picture, the lower reaches of the Belize River and related basins have a very low gradient. The river discharge into the sea is slowed by this minimal gradient as well as limited discharge capacity of the river mouth.*

The Belize River has a complex hydrological relationship with the Spanish Creek drainage, which includes the Crooked Tree Lagoons. In this hydrological system Spanish Creek connects the Belize River to the Western and Southern Lagoons; meanwhile Black Creek connects the Southern and Northern Lagoons to the Belize River. During the rainy season, the water level in the Belize River increases and its flow discharges directly to the Northern, Southern and Western Lagoons through Black and Spanish Creek, respectively. During this time of the year the current flows in a south to north direction. The pattern is reversed during the dry season, when the water levels in the Belize River decrease, and, therefore, Spanish Creek and Black Creek decrease, limiting their contribution to the main lagoons.

Tropical Storm and Hurricane Impacts

The CBS has been impacted by tropical weather patterns for centuries. In the past 15 years, the area has been directly or indirectly impacted by several tropical systems and they are highlighted below. Some of the major impacts at the CBS have been due to flooding.

- October 1998 – Hurricane Mitch
- October 2000 – Hurricane Keith
- August 2001 – Tropical Storm Chantal
- October 2001 – Hurricane Iris
- August 2007 – Hurricane Dean
- October 2008 – Tropical Depression 16
- October 2010 – Tropical Storm Matthew
- October 2010 – Hurricane Richard
- August 2011 – Tropical Storm Harvey
- June 2012 – Heavy June Rains
- August 2012 – Hurricane Ernesto

2.5 Biodiversity of Management Area

According to the 2010 National Report to the United Nations Convention on Biological Diversity, there are 3,408 species of plants (including 613 medicinal plants) found in Belize: 1,219 genera and 209 families. There are 2,500 species of dicotyledons and 1,500 monocotyledons (including 317 species of bromeliads). Faunal species confirmed in the country include 46 amphibians, 43 fresh water fish, 158 molluscs, 288 Lepidoptera, 176 Odonata, 141 reptiles, 577 birds and 163 mammals. An estimate of 634 genera, representing 1,302 species of algae, invertebrates and fish are documented from the marine ecosystems of Belize. Presently, 58 plants, 2 species of fish, 2 species of amphibians and 1 species of reptile have been determined to be endemic to Belize and 43 mammal species in Belize are endangered. There are 137 species of plants and animals listed in the IUCN Red List 2009 of Threatened Species, ranging from extinct to least concern.

The Belize River watershed is biologically rich, including over 384 bird, 73 mammal, and 23 amphibian species (Belize Biodiversity Information System 2001).

2.5.1 Ecosystems

The 2011 Ecosystem map of Belize (Meerman 2011a) was used to assess the general/broad ecotypes of ecosystems found in and around the CBS. Figure 13 shows a GIS distribution map of those ecosystems. The CBS essentially is comprised of five broad ecosystem ecotypes and seven specific ecosystem types and they are noted below.

Lowland Broad-Leaved Moist Forest Ecotype

Tropical evergreen seasonal broad-leaved lowland forest on calcareous soils
UNESCO Code: IA2a(1)(b)K

This very mixed assemblage is found on the middle terraces of many rivers and streams draining from the Maya Mountains. Frequently encountered species are: *Acoelorrhaphe wrightii, Attalea cohune, Bactris major, Bactris mexicana, Belotia campbellii, Calathea lutea, Calophylum brasiliense, Ceiba pentandra, Chrysophyllum oliviforme, Coccoloba belizensis, Coccoloba schiedeana, Costus guanaiensis, Cupania belizensis, Desmoncus orthacanthos, Ficus sp., Guarea sp., Hampea trilobata, Heliconia latispatha, Luhea speciosa, Lysiloma bahamense, Manilkara sp., Maranta arundinaceae, Pimenta dioica, Pouteria sp., Pterocarpus rohrii, Sabal mauritiiformis, Samanea saman, Schizolobium parahybum, Simarouba glauca, Spondias mombin, Stemmadenia donnell-smithii, Swietenia macrophylla, Tabebuia rosea, Tabernaemontana arborea, Virola koschnyi, Vitex gaumeri, Vochysia hondurensis, Zanthoxylum sp., Zuleania guidonia*. The species are a mixture of lowland, moist dependent and somewhat more drought tolerant species.

This is a threatened ecosystem in the Belize River valley and mostly if not entirely found on private property (Meerman 2005b). This is one of the ecosystems in Belize that is not or insufficiently covered within the existing the Protected Areas System and does not meet the 10% minimum IUCN requirement.

Lowland Savanna Ecotype

Short-grass savanna with scattered trees and/or shrubs
UNESCO Code: VA2a(1)(2)

This ecosystem is transitional from Short-grass savannas VA2b(2) to Tropical evergreen seasonal needle-leaf lowland dense forest IA2a(2)(b). *Pinus caribaea* is dominating but rather sparse. Other common trees and shrubs are *Acoelorrhaphe wrightii, Byrsonima crassifolia, Chrysobalanus icaco, Hirtella racemosa, Quercus oleoides* and *Xylopia frutescens*. Generally there is a graminoid herbaceous layer dominated by sedges but with other herbs such as *Cassytha filiformis, Passiflora urbaniana, Turnera odorata* and sometimes *Gynerium sagittatum*. Some low shrubs such as *Clidemia* sp. and *Curatela americana* complete the understory.

Short-grass savanna with dense trees or shrubs
UNESCO Code: VA2a(1/2)

Shrubland

Deciduous broad-leaved lowland disturbed shrubland
UNESCO Code: IIIB1b(a)2

This community varies much according to its topographic position and. Disturbance may be natural, such as the displacement by a river after flooding, or it may be anthropogenic as when land is cleared and left fallow or disturbed by fire. The plant species found are typically 'weedy' species.

Deciduous broad-leaved lowland riparian shrubland of the plains
UNESCO Code: IIIB1b(f)P

Found along riversides where disturbance may be natural, such as the displacement by a river after flooding, or it may be anthropogenic as when land is cleared and left fallow. Plant species found include tall graminoids (reeds, rushes, and sedges) mixed with shrubs, and many types of ruderal communities.

Wetland Ecotype

Tall-herbs lowland swamp
UNESCO Code: VIIB4

This assemblage usually merges with the higher savannas. Where they occur in forested areas and have no drainage channel, they are locally known as 'sibals'. This is a graminoid ecosystem often with *Phragmites australis* and/or *Cladium jamaicense*, *Ludwigia* spp. and a variety of herbaceous species occurs. There is a noticeable shrub component with *Bucida buceras, Crescentia cujete*, and *Acoelorrhaphe wrightii*.

Agricultural Uses Ecotype

Agro-productive systems
UNESCO CODE: SPA

These systems are under agricultural use and include permanent pastures, large scale crop cultivation and areas of intense milpa (also known as plantation) agriculture.

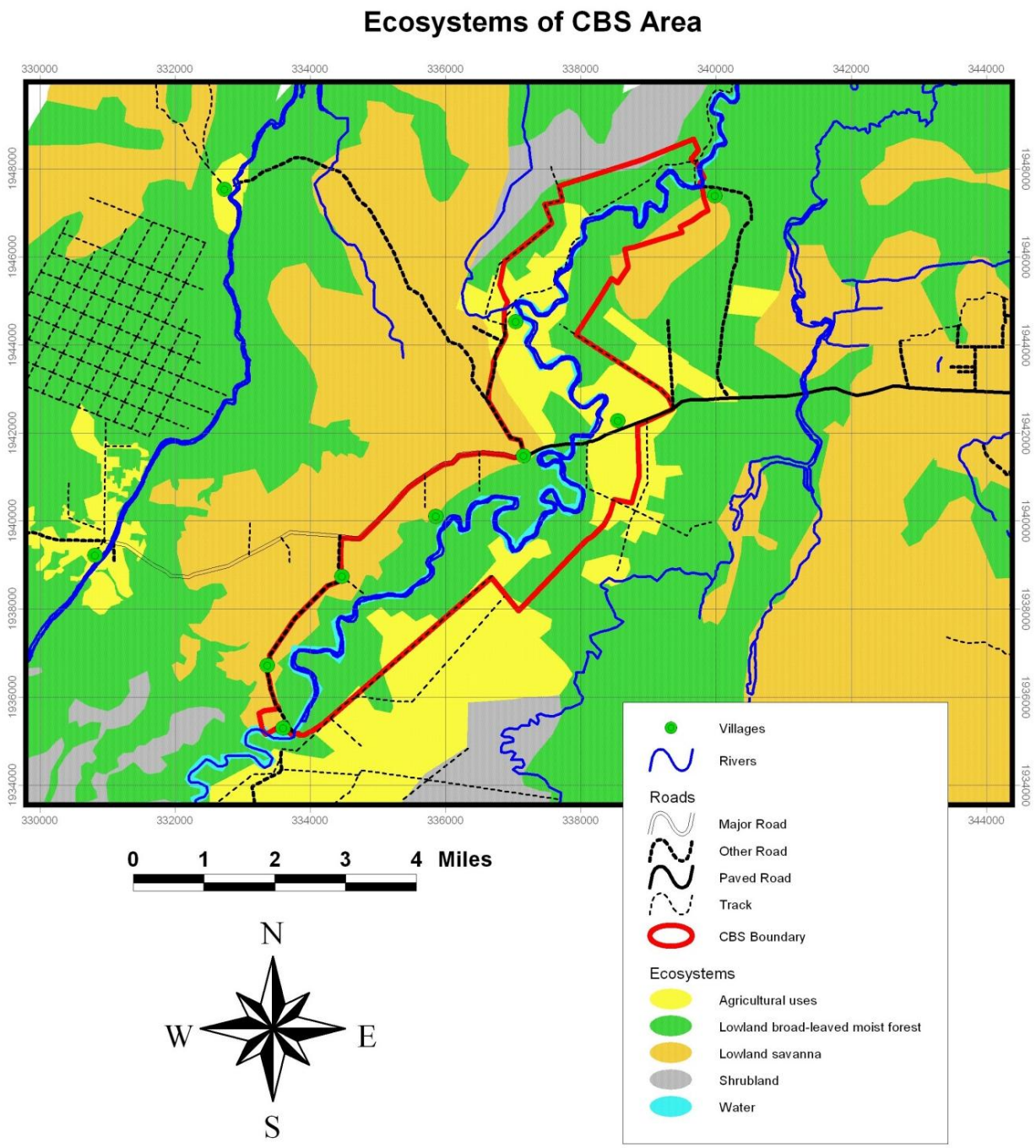


Figure 13. Ecosystems of the CBS area after Meerman (2011a).

Figure 14 shows that there is a large extent of savanna or 'pine ridge' west of the Belize River in the CBS. These areas are ecologically quite different than lowland forest and are also where many homes are located. The management of these savanna ecosystems requires different approaches than the lowland forests along the Belize River and many savanna area are relatively low quality black howler monkey habitat.

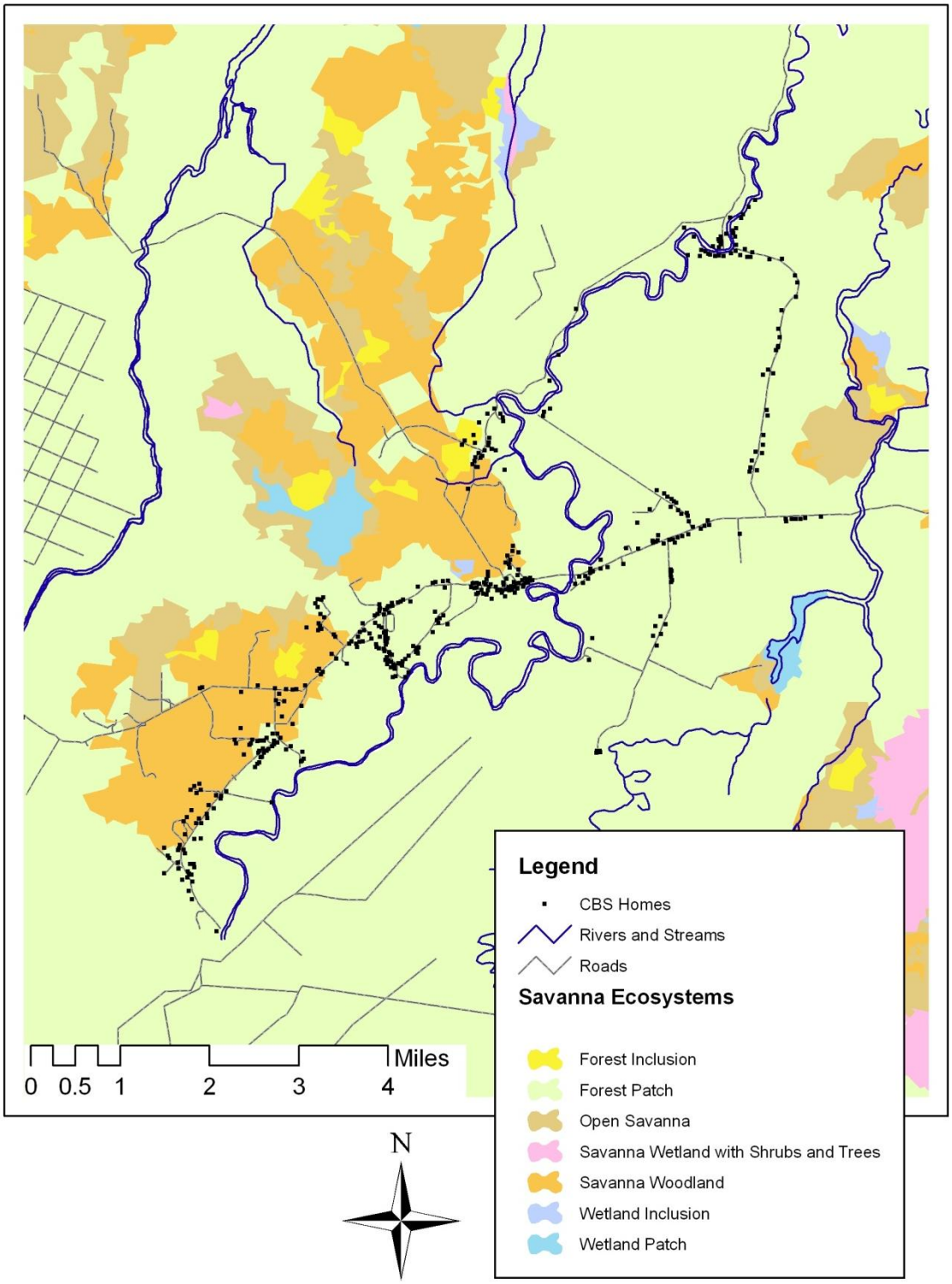


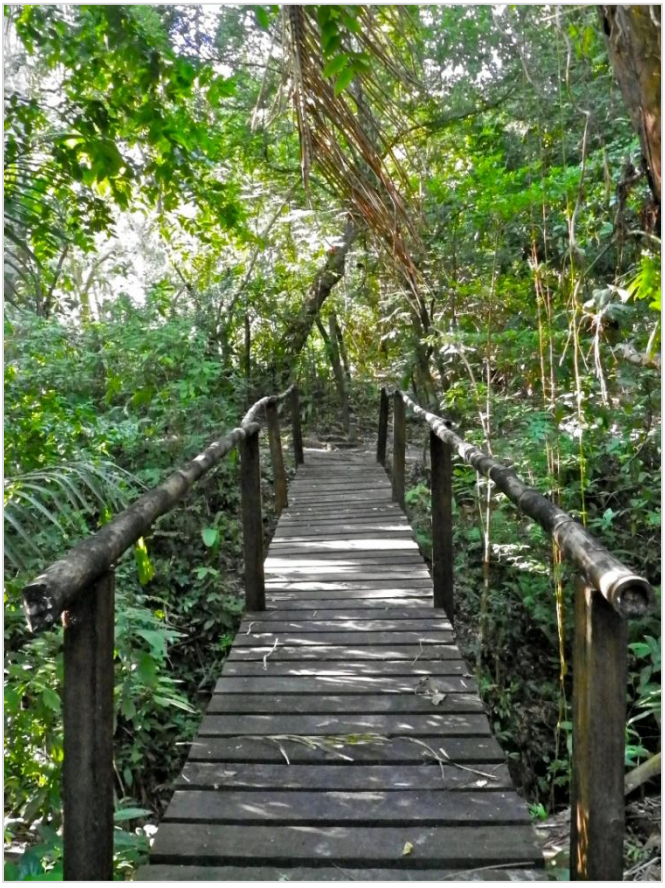
Figure 14. Savanna ecosystems of the CBS area after Cameron et al. (2011).

2.5.2 Flora

The flora in the CBS is typical of the forest types found in the region (see **Section 2.5.1**). A list of all tree species found in the CBS is presented in Annex B. Most importantly, as related to the management of black howler monkeys in the CBS, are the tree species that the howlers use as a food source. Based on a review of black howler feeding ecology studies of Silver et al. (1998) and Marsh and Loiselle (2003), all the tree species that the howlers were observed to eat were compiled and are shown in Table 10.

A total of 68 tree species are noted in Table 10. Lyon and Horwich (1996) found a total of 134 tree species total in their forest sampling. Thus, roughly 50% of the trees found in the CBS are eaten, at least in some instances, by the howlers.

While Table 10 is not an exhaustive list of the food supply for black howler monkeys, it does provide a general guide for conservation planning for individual landholders. The species on the list should receive priority during the clearing of lands. That is to say that the 68 tree species are target food trees for the black howler monkeys and landholders should be encouraged to leave them growing when clearing or modifying land. In addition, any reforestation efforts focused on improving howler habitat, can include these species and they can be targeted for production at the CBS nursery complex.



Bridge along trail in the CBS.

Table 10. A compilation of tree species used by black howler monkeys for food in the CBS. The lists are based on the results presented in Silver et al. (1998) and Marsh and Loiselle (2003).

Scientific Name	Common Name	Family
Allophylus cominia	Cherry	Sapindaceae
Anacardium occidentale	Cashew	Anacardiaceae
Andira inermis	Cabbage bark	Fabaceae
Annona muricata	Sour sop	Annonaceae
Brosimum guianensis	Bastard breadnut	Moraceae
Bucida buceras	Bullet tree	Combretaceae
Cassia grandis	Bucut	Fabaceae
Casearia arborea	Antswood	Flacourtiaceae
Cecropia spp.	Cecropia	Cecropiaceae
Cedrela mexicana	Cedar	Meliaceae
Ceiba pentandra	Cotton tree	Bombaceae
Chyrsobalanus icaco	Coco-plum	Chrysolbalanaceae
Citharexylum caudatum	Pigeon berry	Verbenaceae
Citrus aurantifolia	Sweet lime	Rutaceae
Coccoloba belizensis	Wild grape	Polygonaceae
Coccoloba hondurensis	Wild grape	Polygonaceae
Coccoloba sp.	unknown	Polygonaceae
Cochlospermum vitifolium	Wild cotton	Bixaceae
Cordia diversifolia	Jackwood	Boraginaceae
Cordia sp. 1	Unknown	Boraginaceae
Cupania spectabilis	Grande betty	Sapindaceae
Enterolobium cyclocarpum	Tubroos	Fabaceae
Erythrina spp.	Copna	Fabaceae
Eugenia sp. 1	Unknown	Myrtaceae
Eugenia sp. 2	Unknown	Myrtaceae
Exostema mexicanum	Wild lime	Rubiaceae
Faramea occidentalis	Wild coffee	Rubiaceae
Ficus americana	Fig	Moraceae
Ficus aurea	Fig	Moraceae
Ficus insipida	Fig	Moraceae
Ficus maxima	Fig	Moraceae
Ficus pertusa	Fig	Moraceae
Ficus yoponensi	Fig	Moraceae
Genipa americana	Wild mammee	Rubiaceae
Guazuma ulmifolia	Bay cedar	Sterculiaceae
Inga sp. 2	Unknown	Fabaceae
Inga vera	Bri-bri	Fabaceae

Scientific Name	Common Name	Family
Lonchocarpus pentaphyllus	Dogwood	Fabaceae
Lonchocarpus spp. 2	Dogwood	Fabaceae
Luehea seemannii	Mampola	Tiliaceae
Mangifera indica	Mango	Anacardiaceae
Metopium brownei	Black poisonwood	Anacardiaceae
Miconia argentea	White maya	Melastomaceae
Miconia sp. 1	Unknown	Melastomaceae
Miconia sp. 1	Unknown	Melastomaceae
Miconia sp. 2	Unknown	Melastomaceae
Moraceae sp. 1	Unknown	Moraceae
Morinda panamensis	Yellow wood	Rubiaceae
Attalea cohune	Cohune palm	Arecaceae
Parmentiera aculeata	Cow okra	Bignoniaceae
Pithecellobium lanceolatum	Red fowl	Fabaceae
Randia armata	Hawk nail	Rubiaceae
Samanea saman	Beef tree	Fabaceae
Sapindus saponaria	Soap seed	Sapindaceae
Sapium lateriflorum	Leche maria	Euphorbiaceae
Schizolobium parahyba	Quamwood	Fabaceae
Simarouba glauca	Negrito	Simaroubaceae
Spondias mombin	Hogplum	Anacardiaceae
Spondias radlikoferi	Wild plum	Anacardiaceae
Syzygium cumini	Blackberry	Myrtaceae
Syzygium jambos	Rose apple	Myrtaceae
Tabebuia rosea	Mayflower	Bignoniaceae
Trichilia martiana	Bastard grande betty	Meliaceae
Trichilia hirta	Red cedar	Meliaceae
Trophis racemosa	Ramon	Moraceae
Vismia camparaguey	Old William	Clusiaceae
Zanthoxyllum spp. 2	Unknown	Rutaceae
Zuelania guidora	Drunken baymen	Flacourtiaceae

2.5.3 Fauna

The fauna is the CBS have been summarized in a series of reports, surveys and observations. A compilation of the animal species found in the CBS is noted in Annex B. In addition, Species of Concern have already been highlighted in **Section 2.3.3**.

Black Howler Monkeys (*Alouatta pigra*)

The most significant species in the CBS is the black howler monkey (*Alouatta pigra*). It has been used as a focal species for conservation and tourism activities since the inception of the CBS. A wide range of studies have been conducted on the black howler in and around the CBS and those are summarized in Annex C.

Overall, there have been dramatic Increases in the black howler population on CBS lands (4,700 ha core area) over the past 28 years and those increases are noted below.

- 1984 – some 800 monkeys within the expanded CBS' 47 sq km (4,700 hectare) area
- 1988 - over 1,000 monkeys (Horwich and Lyon 1990)
- 1996 - more than 1,500 monkeys (Bruner and Horwich 1996)
- 2004 – approximately 5,000 (Horwich *personal communication*)
- 2012 – approximately 4,500 – 5,500 monkeys (Horwich *personal communication*)

Thus, since the inception of the CBS, howler populations have increased somewhere in the range of 460 to 590%. This has clearly been a huge conservation success for the CBS and means that the CBS now maintains a viable population of howler monkeys. More significantly, the high density of howler monkeys in the CBS (Horwich et al. 2001a) likely means that the population is somewhere near its carrying capacity and thus the population has reached a plateau and no additional large population increases are anticipated nor should they be managed for. Management should instead shift in focus to maintaining a healthy and genetically diverse population rather than growing the population.

Bush Meat Species

Jones and Young (2004) summarized the hunting of game in the CBS by focusing on the hunting of so-called 'bush meat' species. Hunters were asked what game species they preferred when hunting. The eight most popularly hunted species are shown in Table 11.

Table 11. Survey results showing the preferred wild game species of hunters in and around the CBS (after Jones and Young 2004)

Scientific name	Common Name/Local Name
Agouti paca	Paca, Gibnut
Odocoileus virginianus	White-tailed deer, Deer
Pecari tajacua	Collared peccary
Tayassu pecari	White-lipped peccary, Wari
Cabassous centralis	Armadillo
Nasua narica	Coatimundi, Quash
Mazama americana	Red brocket, Antelope
Dermatemys mawii	Central American river turtle, hicatee

Mammal Species

McCarthy and Mendez (1998) and Meerman (2005b) provide a summary of the mammals found in Belize. There is a rich diversity of mammals that are found in and adjacent to the CBS. In addition, as part of the Northern Biological Corridor, there are also many mobile species that travel through the CBS (Fragoso et al. 1990).

Though not common, all five species of cat in Belize have been observed within the CBS: jaguar (*Panthera onca*), Puma (*Puma concolor*), Jaguarundi (*Herpailurus yagouaroundi*), Ocelot (L*eopardus pardalis*) and Margay (*Leopardus wiedii*). A compilation of mammals that have been observed in the CBS in the past decade (excluding bats and mice) are listed below.

Mammal Order	Common Name	Scientific Name
Opossums - Didelphidae	Water Opossum	*Chironectes minimus*
	Common Opossum	*Didelphis marsupialis*
	Virginia Opossum	*Didelphis virginiana*
	Gray Four-eyed Opossum	*Philander opossum*
Anteaters - Myrmecophagidae	Northern Tamandua	*Tamandua mexicana*
Armandilos - Dasypodidae	Nine-banded Armadillo	*Dasypus novemcinctus*
Cebidae	Yucatan Black Howler Monkey	*Alouatta pigra*
	Central-American Spider-Monkey	*Ateles geoffroyi*
	Gray Fox	*Urocyon cinereoargenteus*
Cats - Felidae	Jaguaroundi	*Herpailurus yagouaroundi*
	Ocelot	*Leopardus pardalis*
	Margay	*Leopardus wiedii*
	Puma	*Puma concolor*
	Jaguar	*Panthera onca*
Weasels - Mustelidae	Neotropical River Otter	*Lontra longicaudis*
	Striped Hog-nosed Skunk	*Conepatus semistriatus*
	Tayra	*Eira barbara*
	Grison	*Galictis vittata*
Raccoon Family - Procyonidae	Kinkajou	*Potos flavus*
	Coatimundi	*Nasua narica*
	Raccoon	*Procyon lotor*
Manatees -Trichechidae	West Indian Manatee	*Trichechus manatus*
Tapir - Tapiridae	Baird's Tapir	*Tapirus bairdii*
Peccaries - Tayassuidae	Collared Peccary	*Pecari tajacu*
Deer - Cervidae	Red Brocket	*Mazama americana*
	White-tailed Deer	*Odocoileus virginianus*
Squirrels - Sciuridae	Yucatan Squirrel	*Sciurus yucatanensis*
Porcupines - Erethizontidae	Mexican Porcupine	*Sphiggurus mexicanus*
Pacas - Agoutidae	Paca	*Agouti paca*
Agoutis - Dasyproctidae	Central American Agouti	*Dasyprocta punctata*

Manatees

The Antillean manatee (*Trichechus manatus manatus*) is found in Central and South America and the Antilles (Quintana-Rizzo and Reynolds 2008). The highest population of this subspecies of manatee in its range is in Belize and they have been observed occasionally in both the Belize River within the CBS and in Spanish Creek for decades (Auil 1998).

Bird Species

The bird diversity of Belize has been summarized by Jones (2003) and Jones and Valelly (2001). Bider (1996) has done the most extensive survey of birds in the CBS and the species she found are listed in Annex B, which is also supplemented with other bird observations over the past 10 years. Regional bird diversity also needs to take into consideration the presence of the Spanish Creek and Labouring Creek Jaguar Wildlife Sanctuaries to the west of the CBS and the creek, wetland and lagoon complex that make up the Mussel Creek drainage to the east and Crooked Tree Wildlife Sanctuary to the north of the CBS. Thus, regional bird diversity is higher than it might otherwise be if this complex of protected areas did not exist.

Fish Species

The fish species that have been found in the Belize River along the reach that comprises the CBS are noted in Table 12. This list is from Horwich and Lyon (unpublished), Esselman 2009) and the BERDS database found at www.biodiversity.bz. The taxonomy follows Greenfield and Thomerson (1997).

Table 12. Fish species found in the Belize River and its Tributaries.

Scientific Name	Common Name	Fished Species
Amphilophus robertsoni	False Firemouth Cichlid	
Angulia rostrata	Conger Eel	
Archocentrus spilurus	Blue-Eyed Cichlid	
Ariopsis assimilis	Catfish	X
Astyanax aeneus	Billam	
Atherinella sp.		
Belonesox belizanus	Topminnow	
Centropomus undecimalis	Common snook	X
Cichlasoma octofaciatum	Jack Dempsey	
Cichlasoma robertsoni	Night and Day	
Cichlasoma salvini	Green Gial	
Cichlasoma spilurum		
Cichlosoma friedrishsthali	Mosmos	
Cichlasoma meeki	Moko Jek	
Cichlasoma synspilum	Tuba	X
Cichlasoma urophthalmus	Crana	X
Dorosoma anale	Longfin Gizzard Shad	
Dorosoma petense	Threadfin Shad	
Eucinostomus melanopterus	Flagfin mojarra	
Gambusia luma	Sleek Mosquitofish	
Gambusia sexradiata	Poopsie	
Hyphessobrycon compressus	Billam	
Ictalurus furcatus	Bakra	X
Megalops atlanticus	Tarpon	X
Ophisternon aenigmaticum	Mudeel	
Oreochromis niloticus	Tilapia	X
Petenia splendida	Bay Snook	X
Poecilia mexicana	Poopsie	X
Rhamdia guatemanlensis	Buttersea	
Strongylura timucu	Timucu	
Thorichthys meeki	Panya gial	
Vieja synspila	Redhead Cichlid	

Tilapia Invasion - Based on Esselman (2009), the tilapia (*Oreochromis niloticus*) invasion in Belize began in 1990 in Crooked Tree Lagoon. Tilapia is an aggressive, invasive species not native to Belize. By 1995, they were found in the Rio Hondo. By 1996 they were found in Belize River habitats nearest to Crooked Tree Lagoon. By 1998, tilapias had spread to several reaches within the Belize River watershed including Mussel Creek. In 1999 tilapias were detected in Moho River, and in Progresso Lagoon and Shipstern Lagoon. By 2000, tilapias were well-dispersed within the Belize River system.

Hicatee (*Dermatemys mawii*) – This critically endangered turtle species is found in and around the CBS. According to Vogt et al. (2011), hicatees are restricted to large deeper rives and their tributaries. It is only a temporary resident of flooded areas and shallow water bodies. It is not found in shallow rocky streams, but instead prefers deep water with relatively cooler temperatures (below 30^{o}C) and prefers soft substrates. In Belize, hicatee are typically found in rivers with over 2.5 m depth and usually over 6 m in depth. The species is completely herbivorous. It has been the focus of research studies dating back to the work of Moll (1986). More recent studies have focused on the species reproductive biology (Polisar 1995), conservation status (Polisar 1994; Polisar and Horwich 1994), exploitation patterns (Polisar 1995, 1997), feeding ecology (Moll 1989) and overall conservation status (Rainwater et al. 2010) in Belize.

Rainwater et al. (2010), based on their country-wide survey of hicatee in 2010, proposed the following conservation recommendations to protect the hicatee:

1. Increase law enforcement to curb illegal harvest of *Dermatemys* and other wildlife and protect riparian habitats. Priority should be given to localities where *Dermatemys* is still common to abundant.
2. Initiate more extensive surveys to better determine the status of *Dermatemys* in Belize and prioritize localities for more intensive protection. Surveys should be a collaborative effort between the Belizean government, university faculty and students, NGOs, and other interested parties.
3. Initiate a conservation education programme, particularly in towns and villages adjacent to *Dermatemys* habitat. This education programme should attempt to raise public awareness of wildlife conservation, inform villagers of the protected status of wildlife in Belize, instill general conservation values, and stress the global uniqueness of *Dermatemys* (its endemism).
4. Initiate a pilot captive breeding programme. Such a programme should focus on generating hatchlings that can be head-started and released to help restore depleted wild populations.

Morelet's Crocodile (*Crocodylus moreletii*) – Platt and Thorbjarnarson (2000) provide a historical perspective on Morelet's crocodile populations in Belize and their findings are summarized here. Commercial crocodile hunting began in Belize during the late 1930s and 1940s. Population declines were first noted in the 1950s, and by the late 1960s *C. moreletii* was nearly extirpated from Belize. Surveys conducted during the late 1970s and early 1980s found smaller crocodiles common in remote areas, but the scarcity of large adults suggested populations had been over-exploited. Morelet's crocodile was afforded legal protection under the Wildlife Protection Act of 1981 and the export of skins was banned (Marin, 1981). Surveys by Platt (1996) and Platt and Thorbjarnarson (2000) from 1992 to 1997 showed recovering populations across northern Belize. A survey of crocodiles in Cox Lagoon in 1993 (Hunt and Tamarack 1993) could provide important baseline data on populations in the Mussel Creek drainage.

However, in recent years, *C. moreletii* populations have once again begun to decline base on recent spotlight surveys in 2011 and 2012 along the Belize River and Mussel Creek. This decline has been observed in other regions of Belize (Platt et al. 2008). These declines are positively correlated with increased hunting pressure and the extensive use of gill nets, especially along Mussel Creek.

2.5.4 Past and Present Research

Scientific research has been an integral part of the CBS since its inception in 1985. Research has focused on several key areas:

- Black howler monkey (*Alouatta pigra*) population, the focal conservation species of the CBS with a limited range in the Yucatan;
- Development and assessment of the CBS as a private, innovative community conservation area and surveys of CBS landowner attitudes and perspectives;
- Land use and forest cover in the CBS and along the Belize River;
- The Central American river turtle or hicatee (*Dermatemys mawii*) a large, highly aquatic, herbivorous, freshwater turtle of the Atlantic drainages of southern Mexico, Belize, and Guatemala; and
- Bird and other wildlife species.

Black Howler Studies - Black howler monkey studies date back to Smith (1970) and Bolin (1981). Dr. Robert Horwich first published on howlers in the 1980s, focusing on their population and conservation status (Horwich 1983a), geographic distribution (Horwich 1984; Horwich 1986; Horwich and Johnson 1986; Horwich 1989), breeding behavior (Horwich 1983b) and roaring behavior (Horwich 1983c; Horwich and Gebhard 1983). Horwich inspired a large group of other research projects on the howler monkeys including several studies of howler feeding ecology, feeding preferences and food choice in the CBS (Silver 1998; Silver et al. 1998; Marsh 1999, 2003; Marsh and Loiselle 2003) as well as on the nutrient and phytochemical content of howler monkey plant species (Silver et al. 2000).

There have also been a number of population studies focusing on howler population size and density (Horwich et al. 2001a; Horwich et al. 2001b) as well as genetic analysis of howler populations (James et al. 1997) and gastrointestinal endoparasite loads (Eckert et al. 2006).

Another area of research focus has been howler behavioral studies. In additional to the behavioral studies conducted by Horwich noted previously, there have also been studies on hand holding in howlers (Brockett et al. 2005), female dispersal (Brockett et al. 2000a), grooming behavior (Brockett et al. 2000b), reproductive seasonality (Brockett et al. 2000c), subordinate male behavior (Kitchen et al. 2004) male takeover of troops (Brockett et al. 1999) and male residence patterns in howler troops (Jones et al. 2008).

Given the conservation success of the CBS, the CBS sanctioned a translocation of black howler monkey to the Cockscomb Basin Wildlife Sanctuary. Four troops consisting of 62 individuals were moved during May of 1992, 1993 and 1994. Several studies were published on this successful translocation (Horwich 1998; Horwich et al. 1993, 2002; Koontz et al. 1994; Ostro 1998; Ostro et al. 1999).

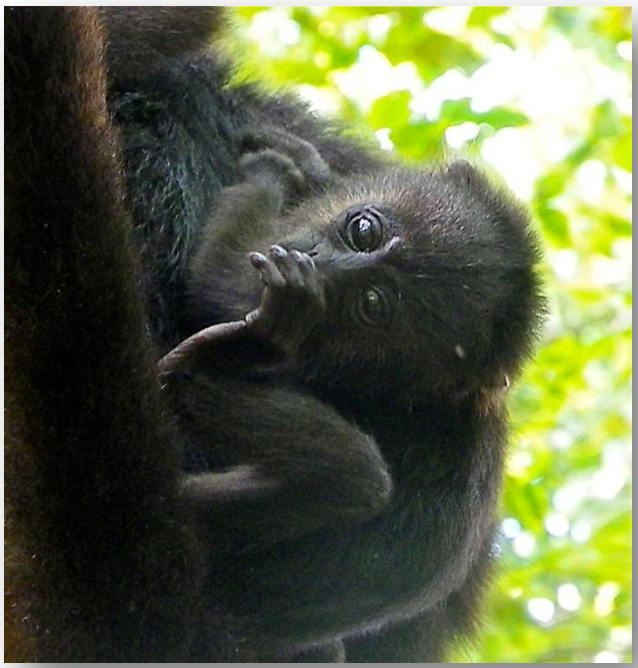
There is also a rich literature on black howler monkeys outside the CBS and throughout the species range. Although those studies are not summarized as part of this management plan, they still contain valuable information that may help address specific management questions as they arise. Studies include food selection (Behie and Pevelka 2012) and social reorganization (Pevelka et al. 2003) after hurricane damage, impacts of trematodes (Kowalzik et al. 2010; Vitazkova and Wade 2012) and resource use in complex landscapes (Pozo-Montuy et al. 2013).

CBS Development and Assessment Studies - Another line of research has been on the history of the development of the CBS from a social and conservation planning and implementation focus. Studies include those centered on the development of the CBS (Horwich 1990, 1998; Horwich and Lyon 1995, 1998, 1999; Horwich et al. 2001). There has also been research conducted on ecotourism and education initiatives at the CBS (Jacobson 1991; Horwich et al. 1993; Horwich and Lyon 1995, 1998; Lindberg et al. 1996; Norris et al. 1998; Blangy and Mehta 2006). A series of investigations of community based perceptions and attitudes about howler monkeys and the CBS have also been conducted (Hartup 1989, 1994; Bruner 1993; Alexander 2000; Lash 2003; Wyman 2008) as well as hunting restraints in the CBS villages (Jones and Young 2004).

Land Use and Forest Cover - There have been numerous studies on the forests and land use of the CBS either exclusively or part of broader studies of the Belize River Valley. These have included studies of modified forest patches (Lyon and Horwich 1996) and land cover changes (di Fiore 2002; Wyman 2008; Wyman et al. 2011).

Central American River Turtle (Hicatee) – There have been several studies on hicatees dating back to the work of Moll (1986). More recent studies have focused on the species reproductive biology (Polisar 1995), conservation status (Polisar 1994, 1997; Polisar and Horwich 1994), exploitation patterns (Polisar 1995, 1997), feeding ecology (Moll 1989) and overall conservation status (Rainwater et al. 2010) in Belize.

Other Wildlife Studies – A range of other wildlife studies have also occurred both in and adjacent to CBS lands. There have been studies of the impacts of forest fragmentation on bird species habitats (Bider 1996) and white collared manikins (Brown 1996).



Infant howler on mother in CBS.

2.6 Cultural and Socio-Economic Values of Management Area

Cultural Values

The cultural value of CBS lands and the adjacent Belize River Valley communities is based on the Kriol history of the area. Since the formal establishment of villages in the region in the 1830s, the area has been home to generations of predominantly Kriol culture-centered villages. The CBS only exists because of the long-held cultural appreciation for the black howler monkeys by the people that co-inhabit the region. Villagers in the Belize River Valley have very rarely ever hunted howlers for food and rarely engaged in capturing them for pets or the pet trade. In fact, there appears to be a deep-seated appreciation and enjoyment of the howlers; they have become part of the fabric of the rural lifestyle along the Belize River. Thus, humans and howlers have co-existed in the Belize River Valley for generations.

The formal establishment of the CBS in 1985 reflected a formal and external acknowledgement of the reality that a natural sanctuary for the howlers already existed due to the internalized attitudes and practices by generations of Belizean Kriols in the villages along the Belize River. But the connection to the land goes well beyond howler monkeys. There is a deep cultural, historical, inter-generational and personal connection between many current inhabitants and the lands that make up the CBS. The Belize River Valley is their home and the CBS is superimposed over this cultural landscape; the CBS is part of the landscape that the local residents call home, their sense of place and their roots. Thus, CBS management always needs to respect and deeply appreciate that the Sanctuary only exists due to the gracious volunteering of its members to share their lands and their homes, with the black howler monkeys.

Socio-Economic Values

The lands that comprise the CBS are also a source of socio-economic values. CBS landholdings represent an opportunity to make a living by using the land and its wildlife and other resources for the betterment of the individual landholder. The management unit of the CBS is the individual landholding but it is also the socio-economic unit that many landholders have to work with. Thus many of the conservation and wildlife management objectives and programmes play out on individual properties where the ultimate decisions about land use are made.

2.6.1 Community and Stakeholder Use

As noted in **Section 2.6**, the basic management unit of the CBS is the individual landholding but it is also the socio-economic unit that many landholders use to make a living. Thus many of the conservation and wildlife management objectives and programmes play out on individual properties where the ultimate decisions about land use are made. Current stakeholder use is based on six main activities:

1. Agricultural activities that include small-scale agriculture (clearing of lands for milpas/plantations) and small-scale to medium-scale cattle ranching;
2. Free ranging cattle and horses throughout the CBS - as this is allowed under the Village Councils Act;
3. Terrestrial hunting and wildlife capture;
4. Fishing and reptile hunting;
5. Medicinal plant and other forest extraction practices; and
6. Settling and building of homes.

Management concerns surrounding the various stakeholder land uses are presented in Table 13. Overall, given that there is no core protected area in the CBS that is protected by statute, all the lands that comprise the CBS are vulnerable to these land use pressures and CBS management needs to be proactive to ensure that conservation planning is part of the fabric of land use in the Belize River Valley.

Table 13. A summary of stakeholder land uses in the CBS and associated management concerns.

Stakeholder Land Use	Management Concerns
Small-Scale Agriculture	• Excessive forest clearing • Loss of howler and other wildlife habitat • Uncontrollable fires • Soil erosion
Small-Scale to Medium-Scale Cattle Rearing	• Excessive forest clearing • Loss of howler and other wildlife habitat • Use of heavy equipment to clear pasture • Use of herbicides to control unwanted plant species • Predation by jaguars
Free Range Cattle	• Manure management issues in Villages • Destruction of milpa and house garden crops • Destruction of regenerating forest seedlings and saplings • Degradation of riverside trails and erosion • Transmission of disease to other cows, humans and wildlife • Traffic hazard
Terrestrial Hunting and Wildlife Capture	• Excessive hunting pressure on bush meat species • Excessive use of dogs in hunting • Excessive harvesting of green iguanas • Capturing of howler monkeys for pet trade • Capturing of parrots for pet trade
Fishing and Reptile Hunting	• Overfishing of area rivers and creeks • Use of illegal gill nets (especially in the Mussel Creek drainage) • Harvesting of Morelet's Crocodile • Illegal harvesting of hicatee • Fishing pressures from outside the CBS area
Medicinal Plant and other Forest Extraction Practices	• Over-extraction of plants and/or plant parts • Planting of non-native (e.g., bamboo) or invasive species • Developing markets outside the CBS
Settling and Home Building	• Excessive land clearing in ecological sensitive areas • Habitat fragmentation

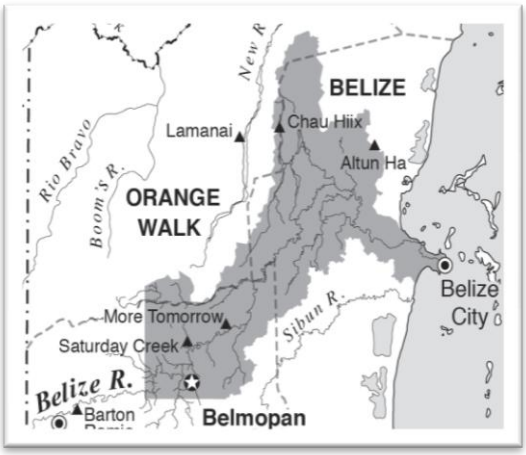
There are also many non-agricultural stakeholders that impact land use in the CBS and those land uses are noted in Table 14.

Table 14. Non-Agricultural stakeholder uses of the lands comprising the CBS.

Village	Stakeholder Land Uses
Bermudian Landing	Community Center; BelRiv Center; Cricket/Softball Field; Schools; Churches
Double-Head Cabbage	Community Center; Cricket/Softball Field; Medical Clinic; Schools; Churches
Flowers Bank	Community Center; Cricket/Softball Field; Schools; Churches
Isabella Bank	Community Center; Cricket/Softball Field; Schools; Churches
Scotland Half Moon	Community Center; Schools; Churches
St. Paul's Bank	Community Center; Cricket/Softball Field; Schools; Churches
Willows Bank	Community Center; Cricket/Softball Field; Schools; Churches

2.6.2 Archaeological Sites

Ancient Maya settlements in the Belize River Valley were economically linked with the large inland city centers of the Petén region, as well as long-distance trading networks of the Caribbean coast of the Yucatan peninsula. The eastern Belize Valley also has a long history that extends from the Pre-classic through Colonial times. The Belize River served as an obsidian trade route for the Mayans (Hammond 1972). El Chayal obsidian transported by an interior route to Tikal was also carried over land to the Belize River for transport by canoe to the coast. Demand for obsidian during the Classic period was very high. Moho Cay, a small flat island near the mouth of the Belize River, served as a "trade node" for early Maya traders (Sidrys 1976).



Recent investigations in the CBS region have been undertaken by the Belize River East Archaeology (BREA) project (Harrison-Buck et al. 2012). The BREA study area encompasses the eastern Belize watershed between Belmopan and Belize City and includes the entire CBS (see gray area in map on left).

There is an opportunity for the CBS to work and partner with BREA project and include archaeological sites into the management plan and even tourism programmes and packages. More information on BREA can be found at: http://www.breaproject.org/PAGES/home.php

2.6.3 Recreation and Tourism Use

Recreation and tourism use are intertwined in the CBS as the Sanctuary lands are embedded both physically and functionally within the matrix of villages and village life. Tourism is focused more on external visitations and although it may have a recreational component, it is considered separate in this report from recreational use of lands within CBS villages by the residents and household members who live in the area. The external tourism segment can be divided into CBS operations and other tourism service providers.

CBS Tourism Segment

Past and Present Tourism - The CBS has focused on tourism and in particular eco-cultural tourism as part of its operations and management goals since its inception in 1985. The tourism infrastructure and staffing has changed over the past 28 years. Ecotourism began with simple trail systems and basic tourist visits. In April 1989, a small natural history museum and visitor's center was officially opened in Bermudian Landing and became a focal point for both tourism and education and was controlled by the CBS. Since the opening of the Museum, a number of iterations of trail systems have been constructed in various portions of the CBS and various forms of bed and breakfast offerings and other tourist packages.

Upon taking over management of the CBS in 1998, the CBS Women's Conservation Group (CBSWCG) established five goals as part of their management mission, including eco-cultural tourism. Although several definitions of ecotourism have been generated (Orams 1995, Wight 1993, Boyd and Butler 1996, Mandziuk 1995, Herath 1996, Buckley, 1994, Linberg et al. 1996, Nelson 1994), there are commonalities that exist among the varying definitions and these reflect the tourism objectives of the CBS:

- Nature-based tourism
- Appreciation of nature as the primary motive for participation
- Supporting the conservation of natural resources
- Providing economic opportunities to local communities and its members
- Respect for the local culture and minimizing social impacts
- Promoting environmental education to visitors

To reflect the organization's vision and mission, the Community Baboon Sanctuary has adopted the World Conservation Union (IUCN) definition, which describes ecotourism as:

> *Environmentally responsible travel and visitation to natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features, both past and present) that promote conservation, have a low visitor impact and provide for beneficially active socio-economic involvement of local peoples.*

Tourism in Belize is one of the most important industries to the Belizean economy, representing approximately 25 percent of the country's foreign exchange. Tourism in Belize can be divided into two broad categories: cruise ship visitors who visit Belize for the day, and overnight night visitors. All cruise ship passengers enter Belize through Fort George in Belize City, and with ship time constraints, visitors are limited in their destinations within the country. The Community Baboon Sanctuary has been and will be ideally located to tap into this pool of potential guests.

Table 15 compares the total number of visitors to Belize to the Community Baboon Sanctuary over a fifteen-year period from 1998 to 2012, and shows that in 1998, the Community Baboon Sanctuary captured almost 2.5 percent of total visitors to Belize. Both overall Belizean tourism and the Community

Baboon Sanctuary noted substantial growth between 1998 and 2004, however, while tourism in Belize continued to grow, the Community Baboon Sanctuary noted a continual decline in visitation beginning in 2005. From 2004 to 2011, visitation to the Community Baboon Sanctuary declined almost 75 percent from 17,000 to 4,548.

Table 15. Total Yearly Visitors to Belize and the Community Baboon Sanctuary from 1998 to 2012.

Year	Total Visitors to Belize	Total Visitors to CBS	% of Total Visitors
1998	190,238	4,500	2.37%
1999	214,926	4,000	1.86%
2000	253,898	5,000	1.97%
2001	244,072	4,500	1.84%
2002	519,209	6,500	1.25%
2003	795,770	9,000	1.13%
2004	1,082,330	17,000	1.57%
2005	1,036,904	13,000	1.25%
2006	903,239	N/A	N/A
2007	875,551	N/A	N/A
2008	842,378	N/A	N/A
2009	937,466	2,119	0.22%
2010	1,003,503	1,222	0.12%
2011	978,141	4,548	0.46%
2012	917,869	2,156*	N/A

Source: Community Baboon Sanctuary, Belize Tourism Board, Caribbean Tourism Organization

*Total through June 2012

Figure 15 illustrates the tourism cycle in Belize from 1998 through 2010 and shows the relationship between the total monthly visitors to Belize and cruise ship tourism. In 2003, tourism in Belize began to elicit a stable annual cycle that closely follows that of cruise ship tourism. High tourist season runs from December to March and low season from roughly May through October. Figure 15 clearly shows that cruise ship tourism is a major driver of tourism in Belize.

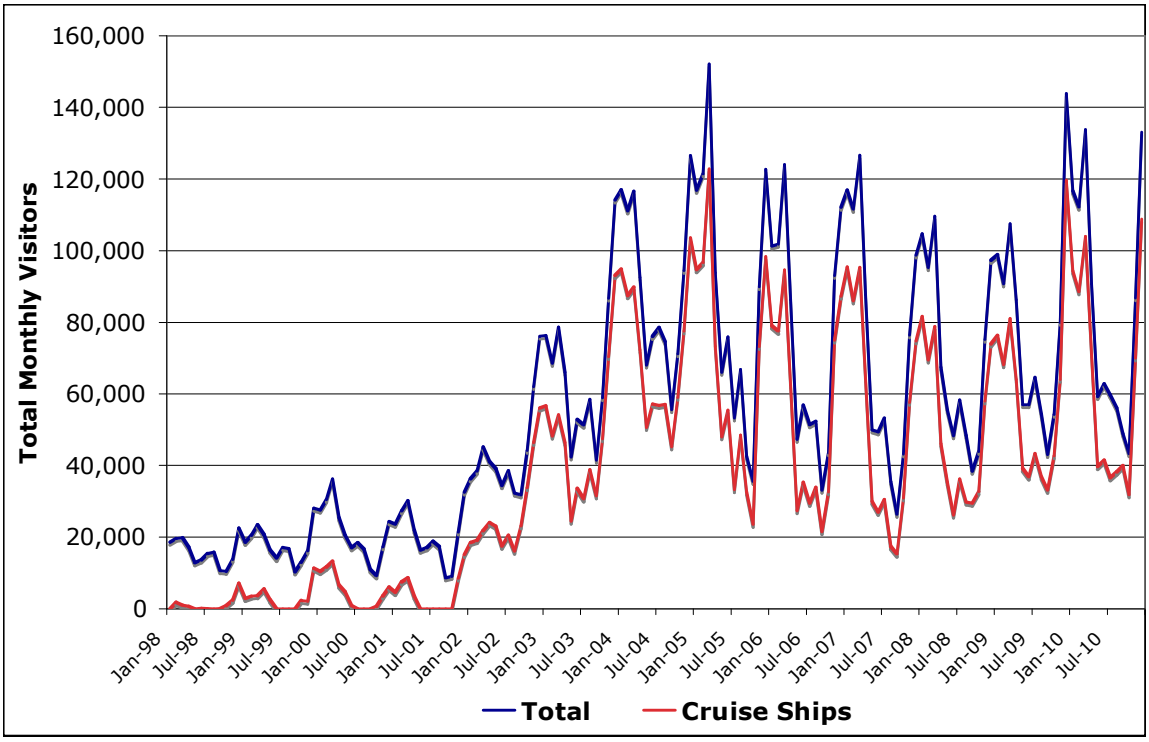
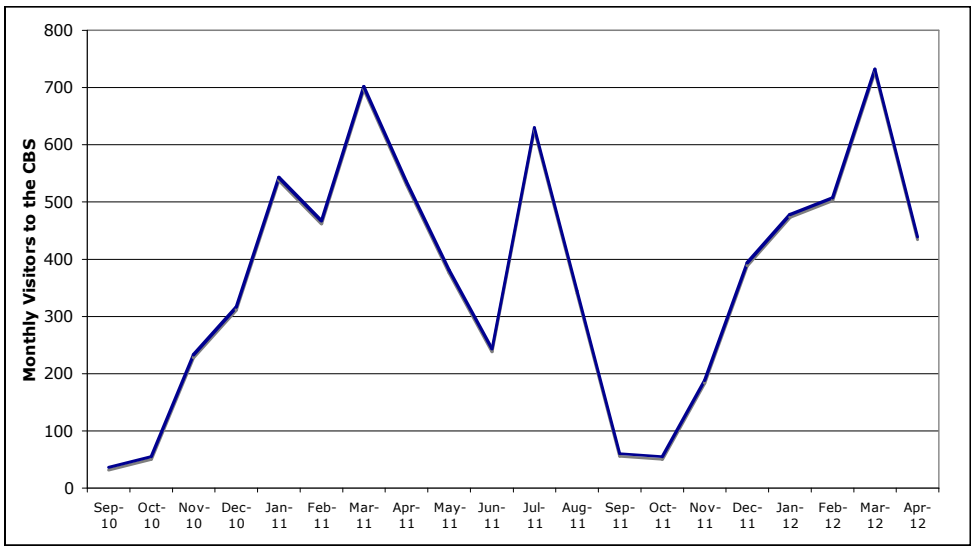


Figure 15. Cruise ship visitors in comparison to total visitors to Belize
(*Source: Belize Tourism Board and Caribbean Tourism Organization).*

The Figure below illustrates the monthly total visitors to the Community Baboon Sanctuary during the period September 2010 through April 2012. The Figure shows that the Sanctuary's high season lags slightly behind the national season, with the peak season beginning in January and running through March. However, the CBS experienced a second peak in July that diverts from the national tourism cycle. This is attributed to the frequency of large groups visiting during that month.



Source: Community Baboon Sanctuary QuickBooks data

Accounting Practices at the CBS

The Community Baboon Sanctuary uses cash basis accounting rather than accrual basis accounting. This means that the CBS recognizes revenue and expenses when cash payments are received or paid, rather than recording transactions when they occur. Cash basis accounting is generally seen as simpler than accrual basis accounting, which is necessary when payments are made or received using credit cards. The CBS does not currently accept the use of credit cards and operates strictly on a cash basis, however, if it was to begin allowing guests to reserve and pay for tours online it would be necessary to switch to accrual basis accounting.

The CBS keeps hard and soft copies of all financial records. From 2006 to 2009, the CBS used *QuickBooks* software to record financial transactions. In January 2011, the CBS received the updated version of *QuickBooks* and training for its use through an APAMO workshop. The CBS maintains written receipt books and cash vouchers which are then transcribed into their computer-based accounting system, *QuickBooks Pro 2010*.

Revenue Generation from Tourism

The primary mechanism for CBS revenue generation is from tourist fees from visitors to the CBS. A schedule of those fees is presented in Table 16. It should be noted that there are other funds generated through the CBS via grant proposals and activities but they are not included in the fee structure and they are project specific.

Table 16. Current tourist fee and commission structure.

Activity	Belizean Rate (BZ $)	Foreign Visitor Rate (BZ $)
Tours		
Nature Walk - Tourists	$7 A / $3.50 C	$14 A / $7 C
Nature Walk – Belizean Students	$1 student	-
Night Hike	-	$24*
River Tour	-	$56*
Crocodile Night Tour	-	$100*
Tour to Other CBS Villages	-	$100
Horseback Riding	-	$50
Birding	-	$50
Commissions		
Nature Walk	$2.50	$3 A / $1.50 C
Night Hike	-	$20
Canoe Trip	-	$30
Crocodile Night Tour	-	$50
A = Adult; C = Child; * Two pax minimum		

In addition to tours, other current revenue generating tourist activities include camping, catering, cafeteria and gift shop sales. A home-stay programme (initially called a bed-and-breakfast programme) was also initiated in 1987 and has been operated by the CBS ever since. It has operated in various villages in the CBS, but mostly in Bermudian Landing. In 2012, the home-stay families involved in the programme were: Ms. Joyola Joseph; Ms. Kancey Joseph; Shawn/Dean Young; Joy/Dean Young; Sydney Russell; and Elston Wade.

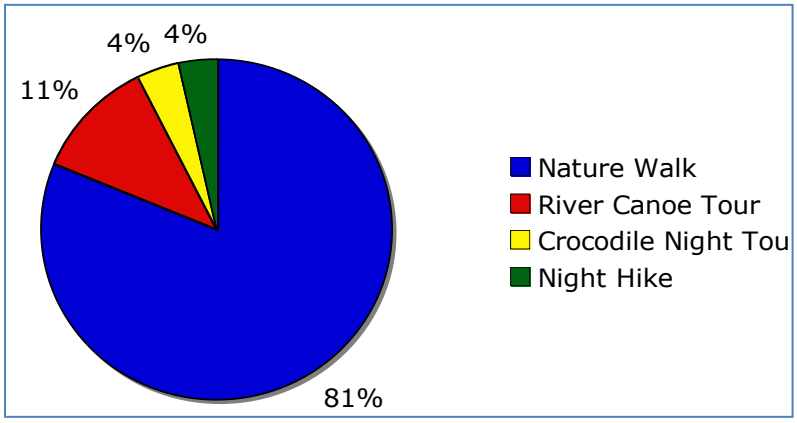
Catering is also provided by several individuals in Bermudian Landing, St. Paul's Bank and Flowers Bank.

While it was not possible to accurately reconstruct CBS tourist revenues over the past ten years, revenue generation for fiscal year 2012 was compiled to assess the proportion of revenue generated by various tourist activities at the CBS. Those fiscal year 2012 results are presented in Table 17.

Table 17. CBS revenues from tourist activities for fiscal year 2012.
(Fiscal Year runs from 1 April to 31 March)

Activity	Revenues Generated	% of Total Revenues
Tours	$55,863	76.01%
Donations	$3,613	4.92%
Gift shop	$3,125	4.25%
Catering	$2,184	2.97%
Cafeteria sales	$1,221	1.66%
Home stay	$936	1.27%
Camping	$785	1.07%
TOTAL	**$67,727**	**92.15%**

Thus, a total of 76% of all total tourist revenues for the CBS come from tours. In addition, the tour guides also make needed income off of the commission from these tours (and tips are accepted).



Furthermore, a breakdown of total tour revenue (some 76% of total CBS revenue generated by tours) was conducted and the results are shown on the left. Nature walks make up the majority of activities (81% of the total tour activity).

Monthly tourist visits to the CBS were also analyzed. Visitation shows a double peak cycle, the first of which corresponds with the peak tourist season from December to March, and a second peak in July. A review of the CBS's records indicates that this second peak is a result of students from universities traveling to Belize during the month of July. Travel to Belize during this time period by school groups is likely a result of the school calendar conflict with normal course schedules. The Community Baboon Sanctuary should reach out to school groups traveling during the off-season to supplement the decline in cruise ship visitors during this period.

A Belizean Rainforest: The Community Baboon Sanctuary Book

Currently, the CBS receives no direct revenue from the sale of the Belizean Rainforest book. It is used as part of the tour guide training programme so the CBS buys them from the organization *Community Conservation in* the U.S. for this purpose. The book is out dated and needs to be updated and re-organized. The CBS leadership needs to work with *Community Conservation* to come to a new agreement regarding both book updates and CBS profits from book sales or consider working with another group/partner to develop the next generation of CBS book whereby the CBS is both highlighted in the book and gains revenue from its sale.

Given the realities in the CBS, the following five strategies are proposed to build and expand the tourism programme.

Strategy 1: Positioning the CBS as an Ecotourism Destination - Ecotourism is based in the natural environment, and conservation and sustainable management of these resources is essential to the planning, development, management and marketing of ecotourism activities. Although many destinations in Belize tout "eco-adventures", activities such as cave tubing and zip-lining do not meet the strict criteria of ecotourism and are examples of nature tourism, which does not involve conservation or sustainability. There are very few ecotourism destinations in Belize that have the ability to cater to cruise ship tourists due to time constraints. The CBS has this ability and should position itself accordingly and market itself as one of the few truly ecotourism attractions available to cruise ship visitors. However, it needs to address some issues before it can truly promote itself as an ecotourism destination

Visitors from all over the world travel to the CBS to experience and appreciate the black howler monkeys in their natural habitat through guided tours. These tours offer visitors with a unique experience while educating them about the local flora and fauna, and the efforts of the CBS to preserve local ecosystems. One concern is the feeding of monkeys that sometimes occurs. This exploitation of monkeys for visitor entertainment can backfire and diminish the CBS's ecotourism reputation. A second area of concern is the solid waste disposal issues in the region.

Strategy 2: Enhancing the CBS's Online Presence - Visitors to Belize generally conduct research about destination activities and entertainment prior to their arrival. By enhancing its online presence through its website (http://www.howlermonkeys.org/) and social media sites on Facebook (https://www.facebook.com/CommunityBaboonSanctuary) and Twitter (https://twitter.com/CBSBelize), the CBS can assist future visitors in identifying the Sanctuary as a destination during their upcoming trip. The CBS website is out of date and the content will need to be updated to reflect the changes resulting from the management plan. Key components of the redesigned website could include an updated CBS mission and history of the organization, a news events section where stakeholders can receive up-to-date information regarding projects and activities, and a page dedicated to visitor testimonials.

Currently, the only means of visitors arranging tours with at the CBS prior to their trip is through email, and while this method has been proven effective, a more efficient means would be to build a feature into the CBS website that would allow potential visitors to schedule (and perhaps pay) for tours prior to their arrival. Online reservations would also assist the CBS in preparing for tours.

The current website allows for donations to be made to the CBS, however, theses donations are funneled through *Community Conservation, Inc.* (based in Wisconsin) and financial donations are rarely received by the CBS. This is of particular issue because donors believe their monetary contributions are being made directly to the CBS. The CBS does, however, benefit from online donations through the purchase of *A Belizean Rainforest* books to sell at the CBS gift shop and printing of photos for monkey adoptions and membership donations by Community Conservation. Each time a donation in made online an email has been sent alerting the CBS's administrative officer. To ensure that money is being received from donors that believe donations are sending directly to the CBS, The CBS could set up a *PayPal* account tied to a separate bank account specifically for donations.

Non-profit organizations are quickly recognizing the importance of including social media sites into their marketing strategies, such as *Facebook*, *Twitter*, and *YouTube*. Social media allows organizations to communicate to a wide and diverse audience and is used to attract supporters and visitors, bring

awareness to particular issues, and fundraise. The CBS is currently using various social media sites to promote the organization. However, it does not have a comprehensive social media marketing strategy, and as a result it is unknown how effectively these marketing tools are being used. Additionally, the CBS has not integrated its social media sites with its website. Doing so would allow visitors to be directed from the CBS website to its social media sites that help these visitors stay abreast on CBS news and events more efficiently.

Strategy 3: Market the CBS Directly on Cruise Ships - It is important for the CBS to reach potential visitors at all stages of their vacation planning. Establishing relationships and marketing directly to the cruise ships will assist guests in choosing the CBS as their excursion prior to their arrival to Belize. Developing relationships with onboard agents will allow the CBS to have a champion on ships that can promote the CBS to guests. These relationships will also allow for the promotion of CBS tours and activities directly on the cruise ships' websites that target visitors who have already selected Belize as a destination. Additionally, cruise ships have television channels dedicated specifically to activities and tours for upcoming ports of debarkation. With proper marketing materials guests can become familiar with the organization's mission and activities offered by the CBS to help make their selection for onshore excursions. The CBS is being promoted on only one ship, through *Bak-a-Bush*, a leading tour operator in Belize (http://www.back-a-bush.com/). By expanding its presence on all cruise ships and allowing guests to book tours directly on the ship, the CBS will increase its visitor numbers.

Strategy 4: Provide New Attractions for CBS Visitors and Create New Tour Packages - Although the CBS offers four different tours, for most cruise ship tourists, their visit to the CBS is limited to a 45-minute nature walk which is usually combined with visits to other nearby attractions, such as Altun Ha or the Belize Zoo. The CBS has an opportunity to identify additional attractions and demonstrations and develop them into various packages tours that would allow cruise ship tourist to remain in the Belize River Valley for the duration of their visit. These packages could be marketed to interested groups through all channels - the CBS website, tour operators and the Belize Tourism Board (BTB) and the Belize Tourism Industry Association (BTIA),.

Tour packages could emphasize natural history, adventure elements and most significantly, highlight the uniqueness of the Kriol culture. The CBS could work with tourism organizations, such as the BTB and BTIA), and experienced tour operators for input and advice during the creation of these packages.

Strategy 5: Develop Relationships with Tour Operators - Tour operators are an integral part of the tourism industry. There are several tour operators in the Belize District that serve as the primary avenue for tourists visiting different destinations throughout Belize. They reach their clients in a number of ways, the most common are by: (1) arranging tours through their websites; and (2) soliciting guests directly as they enter *Tourist Village* in Belize City. Additionally, some operators have established contracts to sell tours to tourists directly on cruise ships. These operators serve as intermediaries between visitors and the CBS. By establishing a solid rapport, tour operators can advocate for and recommend the CBS as a destination for visitors interested in ecotourism adventures. It is important for the CBS to provide tour operators accurate and up-to-date information regarding the available activities for guests, as they serve as the initial point of contact with tourists. The more relationships the CBS develops, the further it expands its reach, and the greater success it will have at increasing its tourist volume.

A summary of the proposed tourism strategies and actions related to those strategies is presented in Table 18.

Table 18. A summary of strategies, actions and timeline for the CBS eco-cultural tourism plan.

STRATEGIES	ACTIONS
Strategy 1 Positioning the Community Baboon Sanctuary as an Ecotourism Destination	• Stop the exploitation of the monkeys by enforcing a zero tolerance policy and desensitizing the monkeys to human interaction • Improve site management through community involvement in an anti-littering campaign • Reduce illegal and over harvesting of natural resource through enforcement of laws and educational campaigns • Reduce negative environmental impacts from agriculture through training in sustainable farming practices
Strategy 2 Enhancing the Community Baboon Sanctuary's Online Presence	• Redesign the CBS website with updated content, a feature allowing online reservations and payment, and allow for direct donations to the CBS • Develop a social media marketing strategy that integrates the CBS website with its social media sites • Follow up with guests with thank you emails directing them to social media accounts and directions on how to make donations
Strategy 3 Market the Community Baboon Sanctuary Directly to Cruise Ships	• Identify contact person for each ship and schedule meetings • Provide cruise ships with materials to market directly to passengers – brochures, videos, etc • Invite contacts to the CBS to experience tours they will promote
Strategy 4 Provide New Attractions for Visitors and Create Tour Packages	• Brainstorm activities and attractions to develop for tourism and group into packages • Identify community partners to "own" tourism project • Solicit input from tourism organizations and experienced tour operators • Market packages on website and to tour operators
Strategy 5 Develop Relationships with Tour Operators	• Identify tour operators throughout Belize and begin meeting with them and the changes at the CBS • Provide tour operators with marketing materials necessary for the promotion of the CBS • Invite tour operators to the CBS to experience tours they will promote

Other Tourism Service Providers in the CBS Area

Other service providers include operations offering lodging, tours and various tourism activities with various levels of amenities. The various tourism service providers are outlined below.

Lodging Operators - In the village of Bermudian Landing there are two lodging operations:

- *Nature Resort* – 12 cabin cabanas owned by Dr. Roy Young. The operation is currently not accepting guests (caretaker joined the Coast Guard).
- *Howler Monkey Lodge* - owned by Edward and Melissa Turton. The Lodge offers tours (as indicated on their website) though guests are referred to the CBS visitor's center for tours; the Lodge has 6 cabins.

In the village of Burrell Boom (some 8 miles east of the bridge crossing in Bermudian Landing) there are two lodging options.

- *Black Orchid* - owned by Doug and Karen Thompson. They offer tours, but tours to the CBS are arranged at the Black Orchid, who takes them to the CBS Visitor's Center. (http://www.blackorchidresort.com/)
- *El Chiclero Inn* - owned by Otho and Mary Faulker. They offer 6 rooms in their Inn.

There are other tour operators in the area and they are listed below:

- *Belize R Us Resorts and Tours* - tour operator at Black Orchid (Burrell Boom - http://www.belizerus.com/)
- *Ecolution Tours* (The Baboon Habitat) owned by Shane Baizar (Bermudian Landing). They allow camping on the property. Shane has a history of flagging down tourists as they pass before they reach the CBS. Shane provides kickbacks to the Belize Taxi Association drivers to take them to the CBS and said they would continue to support Shane until the CBS did the same *(*https://www.facebook.com/pages/Ecolution-Tours*).*
- *Belize and Beyond* (Scotland Half Moon) offers camping and various tour packages. (http://www.beyondbelize.com/)
- According to Wyman (2008) there are 4 households trying to promote their own tourism efforts – 2 in Scotland Half Moon, 1 in Isabella Bank, 1 in Flowers Bank.
- *Bacab Ecopark* (Burrell Boom) – horseback riding, kayaks, ATVs, pool, restaurant/bar, camping, nature trails. (http://www.bacabecopark.com/)
- *Kriol Heritage Center* – operated by St. Paul's Bank Community Group – not currently open to visitors
- *Spanish Creek Wildlife Sanctuary* (Rancho Dolores) – Raymond Reneau is President of the managing committee – mainly birding/canoe tours.

Future – Planning for the future of tourism in Belize is outlined in the 2011 National Sustainable Tourism Master Plan for Belize 2030 (Europraxis 2011). That report aims to achieve a set of quantitative and qualitative specific objectives for the tourism industry in Belize by 2030. The report notes:

> *By 2030, the enhanced overnight destinations would result in doubling overnight tourism arrivals, reaching approximately 556,000 arrivals a year with an average length of stay of 10.6 days and*

spending US$213 a day generating approximately 6 million overnight stays in tourism facilities. The optimized economic impact of the overnight tourism sector to the Belizean economy would increase 7.6 times and reach approximately US$1.2 billion a year.

A controlled cruise tourism development is expected to level at an average compound growth rate of 3.8% in the same 20 year horizon and reaching 1.5 million cruise passengers visits per season. Per visit expenditure is expected to increase to about US$90 per visit resulting in an optimized economic contribution to the Belizean economy of US$134 million per cruise season.

The Belize 2030 Mission Statement is:

Belize is an exclusive multicultural sustainable destination in the Central American Caribbean. It is a destination where the authenticity and friendliness of its people, coupled with the uniqueness of an exotic natural environment can be actively experienced within a conserved world.

This mission is clearly aligned with the CBS mission and strategic plan and thus the CBS is poised to tap into the predicted and planned for, growing tourism market.

Local Community Recreational Use

The CBS Villages also has a number of recreational facilities for area residents, including cricket/softball fields, basketball courts and several access points to the Belize River for swimming,

2.6.4 Other Economic Use

Given that the CBS is on private lands, all lands within the CBS and surrounding regions are potentially open for all manner of economic uses. One key role of the CBS management plan is to help guide the various economic uses of the CBS lands such that as a whole, it meets the conservation objectives of the CBS.

The following list provides a summary of the main economic uses currently taking place within and/or immediately adjacent to CBS lands.

Community-Based Groups

- Flower's Bank Cohune Oil Processing Facility – a new building was inaugurated in 2010 and has equipment to crack and grind cohune nuts, space for bottling and storing cohune oil, and office space. The facility uses cohune nuts found in the surrounding forest; they also purchase cohune nuts from area residents
- Dauntless Designers of Double Head Cabbage – Women's group involved in sewing/jam-making; they have a kitchen with cooking/canning equipment in the back of the DHC community center; they also have a building with sewing machines and work table for sewing projects located across the field from the DHC community center
- Nimble Fingers in St. Paul's Village – Group involved in craft sewing/Kriol Heritage Center; the current Kriol Center building has sparse exhibits and the group is looking to repair building, and create a space within the museum to make their crafts.

Private Economic Uses and Businesses

- Paradise Bar (Willow's Bank)
- Best Buys (Bermudian Landing)
- Delvorine's Cool Spot (Bermudian Landing)
- Delvorine's Shop (Bermudian Landing)
- Orlando Salas' Canoe Rentals (Isabella Bank)
- Salas Bamboo owned by Chris Salas (Isabella Bank)
- Herrera's Meat Shop (Isabella Bank)
- Mennonite Gas Station and Shop (Scotland Half Moon)
- Shop (Isabella Bank)
- Shop (Willow's Bank – across from the community center)
- Shop (Double Head Cabbage – by the field/across from the community center)
- Bar (Double Head Cabbage)
- Charlie's Wine (Double Head Cabbage)

2.6.5 Education Use

Given that the CBS is integrated into the fabric of rural life in the lower Belize River Valley, educational use in the Sanctuary includes all educational infrastructure and systems in the region. Overall, there are three main educational threads running through the CBS villages. The first thread is CBS **landowner education programme**. This is the main mechanism of conservation education for landowners and is the basis of conservation management on lands within the CBS. The second thread is the **existing primary and high school structure** in the Belize River Valley that is focused on providing basic education for children in households across the region. The third thread is centered on **CBS environmental education efforts** that are run by the CBS. These include both eco-cultural tourism education provided by tour guides as well as the educational exhibits of the CBS museum. While there is overlap between the three threads, it is important to note that all are important to the success of the CBS and that education improvement in the area villages spawned by CBS actions and programmes can be considered a mutually shared benefit that benefits many families and children in the area.

Landholder Education Programme

The individual landholding (freeheld or leased) is the basic management unit of the CBS. All conservation plans, management programmes and discussions regarding habitat protection are based on individual landholdings. Thus, educating landholders about the conservation programme of the CBS and the importance of maintaining adequate habitat for the black howler monkeys is a central role of the landholder education initiatives. The main mechanism for landowner education is the conservation pledge, accompanied by a conservation map of the landholder's property, and an individually designed management plan. Ideally, discussions with landowners takes place on their land where CBS personnel and the landowner have a chance to discuss and craft the conservation management plan together while on the property.

A summary of landowners who have signed pledge to join the CBS and volunteered to protect howler habitat on their properties is shown in Table 18.

Table 19. Pledged landowners in the CBS based on pledge records held at the CBS.

Map ID	2000 Owner Name	Vil	by 1990 Pledged	by 2000 Pledged	by 2002 Pledged	2013 Owner
1	Edward McFadzean	SP	X	Y		
3	Wallace Revers (wife Orma)	SP	X	Y		
4	Herman Williams	SP	X	Y		
5	Kent Thompson (wife Kathleen)	SP		Y		
5	Matthew Thompson	SP	X	Y		
	Cyril Thompson (Matthew's son)	SP			Z	
6	Marta Rogers	SP	X	Y		
7	(Marsella) Estella Cassasola	SP	X	Y		
10	Basil Thompson (wife Olive)	SP	X	Y		
11	Bernice Cassasola	SP		Y		
12	Eustace Pakeman	SP	X	Y		
15	Oswald McFadzean (wife Vaicina)	SP	X	Y	Z	
	Vaicina McFadzean	SP			Z	
	Evette Joseph	SP			Z	
	Theresita Fermin	SP			Z	
	Adalena Fermin	SP			Z	
26,28	John McFadzean, Jr.	SP		Y		
	Albert Ferman (Niconor's son)	SP		Y		
	Manny McFadzean	SP	X	Y		
17,18,24	Ruben Belisle	WB	X	Y/R		
17,18,24	Wilward Belisle (Ruben's son)	WB		Y		
20,23	Joe Roca (wife Olive)	WB	X	Y		
	Delcie Roca (Joe's daughter)	WB			Z	
	Clinton Roca (Joe's son)	WB		Y		
22	Albert McFadzean	WB	X	Y		
25	Leopold Pook (wife Annie)	WB	X	Y		
26,28	John McFadzean, Sr.	WB	X	Y/R		
29	Randolph Young (wife E. Harris)	WB	X	Y		
30	Robert Stephenson (5 sons)	WB		Y		
30	George Stephenson (Robert's son)	WB	X	Y		
	Harold Sutherland	WB	X	Y		
	Charles McFadzean, Sr.	WB		Y		
	Philip Young	WB			Z	
	Michele Belisle	WB		Y		
	Morline Burns	WB			Z	
	Lloyd Stephenson, Sr.	WB	X	Y/R		
	Lloyd Stephenson, Jr.	WB		Y		
	George Flowers	WB	X	Y		
	Myrtle Perriott	WB			Z	
	Lloyd Perriott	WB			Z	
	Lucien Belisle	WB			Z	
	Milword Belisle	WB			Z	
	Garnet Smith	WB			Z	
	Ewen McFadzean	WB			Z	
	Juanita Banner	WB			Z	
31	Peter Harris	DHC	X	Y		
32	Charles Wingo	DHC	X	Y		
33	Roy Talbert (wife Rita)	DHC	X	Y		
35	Maud Armstrong	DHC	X	Y		
36	Bert Young	DHC	X	Y		
37	Casmore Martinez	DHC	X	Y		
37	Lloyd Martinez	DHC	X	Y		
39	Selvyn Jeffers	DHC	X	Y		

41	Edwin Pitts	DHC	X	Y		
42,48	Benjamin Baptist Sr.	DHC	X	Y		
44,107	Benjamin Baptist Jr. (now Sr.)	DHC	X	Y		
45	Lloyd Flowers (wife Joyce)	DHC	X	Y		
46	Cardinal Nicolas	DHC	X	Y		
47	Charles Stump	DHC	X	Y		
	Lawrence Flowers	DHC		Y		
	Randolph Baptist	DHC		Y		
	Norris Harris	DHC		Y		
	Emmanuel McFadzean	DHC	X	Y		
	Irma Nicholas Jones	DHC		Y		
	Winston Staine	DHC		Y		
49	John Humes	BL	X	Y		
50	Fallet Young	BL	X	Y	Z	
51	John Swift	BL	X	Y		
51	Roy Young (Alvin's son)	BL	X	Y		
52	John Link	BL		Y		
54	Roy Joseph	BL	X	Y		
55	Paul Joseph (wife Geraldine)	BL	X	Y		
56	Sydney Russell	BL	X	Y		
57	Edna Baptist	BL	X	Y	Z	
58	Elston Wade	BL	X	Y		
59	Alvin Young	BL		Y		
59	Camille Young, Sr.	BL	X	Y		
60	Bernard Herrera (wife F. Baizer)	BL	X	Y		
61,76	Vicente Herrera	BL	X	Y		
62	Raymond Lord	BL	X	Y		
63,71	Edward Herrera	BL	X	Y		
	Ralph Flowers (wife Jean)	BL		Y		
	Rudolph Joseph (wife Joyola)	BL		Y	Z	
	Eric Wade	BL			Z	
	Cauline Flowers	BL			Z	
	Lisborne Joseph	BL			Z	
	Julian Joseph	BL			Z	
	Brian Joseph	BL			Z	
	Nicolas Baisar	BL		Y		
	John Perez Sr.	BL	X	Y		
	Clifton Young	BL	X	Y		
64,69	Walter Banner, Sr. (wife Matilda)	IB	X	Y		
65	Orlando Salas (wife Zonia)	IB	X	Y		
66	William "Buck" Hyde	IB	X	Y		
67	Eduardo Eck (wife Lucia)	IB	X	Y		
68	Allan Herrera (wife Nimi)	IB	X	Y		
70	Dan Lanza	IB	X	Y		
72	Emilio Lanza	IB	X	Y		
73	Horace Hulse (wife Inez)	IB	X	Y		
74	Joe Lanza	IB	X	Y		
78,160	Dudley Hendy	IB	X	Y		
78	Edwin Hendy (wife Dellis)	IB	X	Y		
79	Melford Hendy, M&H River Camps	IB		Y		
75	Joseph Arana	SHM	X	Y		
89,140	Orlando Dawson	SHM	X	Y		
94	Thomas Myvett (wife Idolly)	SHM	X	Y		
	Idolly Myvett	SHM			Z	
96	Anastacio Soler	SHM	X	Y		
	David Moody Sr.	SHM			Z	
	Orlando Reyes	SHM			Z	

	Lilian Soler	SHM			Z	
	Steve Moody	SHM			Z	
113	Anastacio Soler Jr.	SHM			Z	
117	Francis Baisar	BL	X	Y		
121	Carmen Flores	SHM			Z	
	Leeking Sting	SHM			Z	
	J. Ellis Beachy	SHM			Z	
	Griffith Arnold	SHM			Z	
132	Wain Moody (Sarita's son)	SHM		Y		
	Charles Young	SHM			Z	
	Bob Foreman	SHM			Z	
	Derrick Fergusen	SHM			Z	
	Harold Arnold	SHM		Y		
FBE+	Vallon Hendy	FB		Y		
158	Henry Dawson	FB	X	Y		
FBE+	Linnette Rhaburn	FB		Y		
FBE+	Cordell Robinson (wife Sharon)	FB		Y		
FBE	Cecil Flowers (wife Daisy)	FB	X	Y		
FBE+	Egbert Robinson (wife Roselle)	FB		Y		
FBE	Calbert Hinks	FB	X	Y		
FBE+	Ruben Rhaburn	FB	X	Y		
FBE	Huson Baptist	FB	X	Y		
FBE	Robert Mitchell	FB	X	Y/R		
FBE	Eleanor Mitchell Robert's dghter)	FB		Y		
159	Lincoln Flowers	FB	X	Y		
	CUMMULATIVE TOTAL		**74**	**103**	**140**	

Existing Regional Schools

Belize Rural Primary School (BRPS) - In 2001, 7 of the 9 primary schools in the CBS region were amalgamated under the Ministry of Education and became the Belize Rural Primary School. Of the 8 schools in the area prior to amalgamation, 3 were run by the Roman Catholics, 3 by Anglicans and 2 were run by the Mennonite mission. Under the amalgamation, 7 schools were amalgamated under one administration run by a Board of Directors with representation from all the denominations. The Mennonite schools remained a separate entity. The 7 schools consolidated were: *St. Thomas* (Double Head Cabbage), *St. Paul's* (St. Paul's Bank), *St. Isabella* (Bermudian Landing), *Our Lady of Sorrows* (Rancho Dolores), *St. Luke's* (Lemonal), *Scotland Primary* (Scotland Half Moon) and *St. Stephen's* (Flower's Bank).

The amalgamated school is divided into lower middle and upper divisions. Infant schools (Infant I and II) are located at Rancho Dolores and Flowers Bank. The middle division is in Bermudian Landing (Standard I, II, III) and the upper division is in Double Head Cabbage (Standard IV, V, VI). The some 19 teachers who taught prior to amalgamation continue to teach in the new school. There are some 300-350 students in the primary school system. Students are bused from each of the villages to their respective primary school (and high school).

In addition, there is now a school feeding programme. Prior to the consolidation students would have an hour lunch break where they would go home for lunch, which isn't possible anymore with the students coming from different villages). Prior to consolidation, the schools each had a teaching principal, now BRPS has an administrative principal.

Other Primary Schools in the Lower Belize River Valley - The Isabella Harmony Primary School and the Pine Ridge Primary School in Double Head Cabbage are both still operated by local Mennonites. Furthermore, many students also go to primary school outside the BRPS region, particularly to 2 schools in Burrell Boom, 2 schools in Ladyville and a few primary school students travel to Belize City. There is no school bus for these students, so they must take the regular village buses to these schools.

Belize Rural High School - The Belize Rural High School is located in Double Head Cabbage and includes 1st Form through 4th Form students. The three areas of study are: Business, General and Vocational. The 2011-2012 school year tuition was BZ$370. The High School currently has approximately 100-125 students.

Faculty and staff are comprised of the principal (Mr. Juan Góngora), a secretary, a bursar, a counselor, two watchmen, a caretaker and nine teachers. The school does have a computer lab with Internet access

It should also be noted that many high school students (much more than primary school students) go outside the Belize River Valley for school. There was, in the past, a school bus for these students that ran from the Belize River Valley villages to Belize City, however, the Ministry of Education recently changed it so that it only runs to Ladyville Technical School. Thus, students that go to Belize City must either take the school bus and transfer to a regular bus (cutting down costs) or take a village bus to school.

Harmony Preschool - This school is the only preschool in the Belize River Valley and is located in Bermudian Landing. The school has half day sessions for the students and has a monitored and healthy food programme. The school has 2 teachers – one of which is also the principal, and has approximately 50 students. Ms. Jessie Young is the also the founder and Manager of the school.

CBS Environmental Education Initiatives

CBS educational initiatives can be divided into two main programmes: (1) the CBS Tourism Education Programme; and (2) Summer Education Programmes. The first programme is strongly linked to the eco-cultural tourism mission of the CBS and the second programme is an integral part of the educational mission of the CBS.

The main tenets of the CBS tourist education programme are based on educating tourists about the eco-cultural aspects of the CBS and providing them with both a recreational and educational experience. The education is based around both trail tours and the CBS Museum.

Trail tours are given by CBS tour guides who are trained in providing information on the history of the CBS, the flora and fauna of the region, human use of forest resources and the conservation mission of the CBS. In this way tourists are educated as to the nature of the CBS and its programmes. This effort not only educates tourists, but also provides an opportunity to gain income for the CBS (**Section 2.6.3**), build a good reputation as a tourist destination and create longer-term relationships with some visitors who might support CBS efforts in the future.

The CBS Museum was opened in 1989 and instantly became a focal point and tangible representation of the CBS. It is an essential component of both the eco-cultural tourism and educational programmes the CBS operates. Museum exhibits were re-done by faculty and students at Stockton College in New Jersey, in 2004. In 2012, the museum exhibits were again be re-done and refurbished by Merrimack

College in Massachusetts, to update the content of the exhibits as well as re-align museum exhibits with the mission of the CBS outlined in the 2011 Strategic Plan.

The CBS Summer Programme coincided with the building of the Education Center at the CBS in 2003 and that site is used to host the annual CBS summer programme. This programme has been very successful but it needs to be consistently offered.

Based on the various educational initiatives, a summary of management concerns under each initiative is provided in Table 20. Many aspects of the educational programmes and uses at the CBS are in good shape, but there is clearly need for improvement in some areas.

Table 20. Management concerns regarding educational initiatives at the CBS.

Educational Initiative	Management Concerns
Landowner Education	• There has not been adequate follow-up on conservation pledges • A landowner database needs to be developed • Re-pledging of all landowners may be needed
Local Schools	• There is a minimal working relationship with area schools; building these relationships is a critical part of community development • More conservation and environmental education programmes during the regular school year
Eco-Cultural Tourism	• Trail system in CBS is very limited • Museum exhibits need to better reflect the mission of the CBS and the people and the Kriol culture of the Belize River Valley • The museum is in need of some structural repair • Museum gift shop should emphasize local products and have exhibits on where products come from.
Summer Programmes	• They need to be consistently offered

In conclusion, educational use of the CBS is varied and complex and involves all segments of Belize River Valley society as well as tourists. Moving forward, the 2001 CBS Strategic Plan calls for increased Public Awareness. This will be achieved by building local and regional awareness of the importance of the CBSWCG's work and operations and implementing two major strategies: (1) Education Outreach, and (2) Communications. The CBS Strategic Plan calls on achieving these strategies by:

- Developing and implementing an Education Outreach Programme
- Developing an education curriculum, focused on climate change issues, for village schools
- Coordinating a civic pride campaign targeting local schools and establishing a recycling and garbage disposal programme
- Organizing and conducting school presentations and field trips
- Organizing tours for volunteers, teachers, students
- Organizing and conducting a tree planting programme (fruit trees)
- Establishing the Education Center as a Learning/study area equipped with work tables, chairs, computers and informational-educational posters

The current management plan embraces theses strategies as the CBS forms new strategic partnerships with Belize River Valley schools.

3. Analysis of Conservation Targets and Threats

3.1 Conservation Targets

3.1.1 Identification of Conservation Targets

Conservation targets are essential for developing, implementing, assessing and altering a management plan. The CBS has evolved to extend beyond the protection of black howler monkeys, yet this remains a critical and essential conservation target and is at the core of all conservation work. Overall, there are five main conservation targets for the CBS and they are summarized in Table 21.

Table 21. A summary of CBS conservation targets, justification for their choice and ecosystem impact.

Conservation Target	Justification	Species, Communities or Ecological Systems represented by Target
Protection and Maintenance of a Viable Population of Black Howler Monkeys	This target has been at the core of the CBS mission from its inception in 1985 to the present. The species (*Alouatta pigra*) is listed as endangered by the IUCN and vulnerable in Belize. It has been the basis of habitat management and conservation planning, it has spawned a diverse research programme, it has drawn international attention to the region and it is the basis of nature tourism in the area.	Black howler monkeys are distributed throughout the CBS with an estimated total population between 4,500 and 5,500 monkeys. The forests where the species preferred habitat appears to be *tropical evergreen seasonal broad-leaved lowland forest on calcareous soils*, which is an underrepresented ecosystem in Belize's Protected Areas System. (Meerman 2005).
Maintaining the Interconnected Corridor Integrity of CBS Lands	This target is focused on the structure, connectivity and coverage of the forested regions within the CBS in relation to their functioning as a biological corridor. Fragmentation of riparian forests remains a constant threat and this not only threatens habitat on individual landholdings, but also the connectivity between landholdings across the landscape.	Maintenance of an effective corridor function of CBS lands is of benefit to a large array of plant and animal species that utilize the forests in all their successional stages. Corridor integrity improves conditions for mobile species, canopy species, forest habitat species and migratory species.
Sustainable Use of Fish, Reptile and Wildlife Resources in the Region	There continues to be pressure on existing wild fish, reptile and wildlife populations in the lower Belize River Valley. Fishing pressure has increased along the Belize River and especially in the Mussel Creek drainage. In addition, hunting pressure on the Central American river turtle or hicatee (*Dermatemys mawii*), Morelet's crocodile (*Crocodylus moreletii*) and green iguana (*Iguana iguana*) have also increased dramatically in recent years. There is a need to address these conservation threats with a comprehensive strategy.	The hunting and fishing pressure in certain areas in and around the CBS impacts the entire Belize River Valley. In some instances, the pressure is most intense outside lands that currently make up the CBS. The most dramatic example is the fishing and crocodile hunting occurring in the Mussel Creek drainage. By working to enforce existing Belizean laws, working with communities and stakeholders and creating new management zones, the CBS will be expanding the umbrella of conservation to a wider geographic range and human audience.
Protection of Lands Linked to the Northern Biological Corridors in Belize	As a community conserved protected area, the CBS should not be viewed in isolation. It is geographically linked to the Northern Biological Corridor system in Belize and thus needs to incorporate this in its management.	The connectivity of the CBS with the Northern Biological Corridor sheds a new light on the importance of conservation initiatives on private lands. It also expands the geographical scope of the CBS and links it to the national conservation community.
Development of a Comprehensive Pledge System to Achieve Conservation Targets	The voluntary pledge system has been the core management approach since the CBS was initiated. It is a system that respects individual landholder rights while simultaneously providing management and conservation guidance.	This would impact all the CBS lands but all the proposed new management zones for the areas around the CBS. In this way, there would be an expansion of the CBS into other areas that might include other wildlife other than black howler monkeys.

3.1.2 Assessment of Conservation Target Viability

Conservation planning requires the ability to assess the status of conservation targets over time, to enable planners to see whether management actions are successful in bringing about the desired changes. A viability rating system has been used to describe the status of the CBS conservation targets outlined in **Section 3.1.1** in a standardized manner.

The conservation targets in the last section have been assessed using the viability rankings used below.

Viability Ratings (Adapted from TNC 5-S System)	
Very Good	Requires little or no human intervention to maintain conservation target at acceptable level (e.g. healthy, breeding populations, minimally impacted ecosystems)
Good	May require some human intervention to maintain conservation target at acceptable level (e.g. reducing / preventing hunting pressure)
Fair	Requires human intervention - if unchecked, the conservation target will be seriously degraded
Poor	If allowed to remain in the present status, restoration or preventing local extinction will be impossible

The assessments of the five conservation targets are presented on the following pages (Table 22). They represent the best assessments possible.

Table 22. A summary of conservation target viability assessments for the five CBS targets.

CBS Conservation Targets – Indicators for Viability Ranking			
Conservation Target	Current Rating	Goal	Justification for Rating, Goal and Indicator
Protection and Maintenance of a Viable Population of Black Howler Monkeys	**Very Good**	**Very Good**	**Justification:** Black howler monkey populations have steadily increased since 1985 and they arguably are close to carrying capacity with a high density and total population between 4,500 and 5,500 monkeys.
			Goal: Very Good. To maintain a viable population of black howler monkeys in the CBS
			Indicators: Regular censusing of monkeys (every 2-3 years) will indicate overall population levels, density and troop size in CBS

Table 22. A summary of conservation target viability assessments for the five CBS targets.

CBS Conservation Targets – Indicators for Viability Ranking			
Conservation Target	Current Rating	Goal	Justification for Rating, Goal and Indicator
Maintaining the Interconnected Corridor Integrity of CBS Lands	**Fair**	**Good**	**Justification:** Based on recent assessments of the CBS by Wyman (2008), the widespread fires of 2011 and recent assessments based on an aerial flyover in March 2012, there is increased overall fragmentation on CBS lands than is not optimal for forest canopy interconnectivity in the CBS.
			Goal: Good. Given that the forests are undergoing succession and re-growth after the 2011 fires and that all CBS landowners will be receiving updated landowner maps and conservation plans, there is an opportunity to increase connectivity of CBS forests.
			Indicators: In order to monitor forest cover and connectivity in the CBS, landowner pledges and conservation plans need to be re-visited regularly (every 1-2 years) and updated. Evaluating year to year changes will be a necessary long-term activity.

CBS Conservation Targets – Indicators for Viability Ranking			
Conservation Target	Current Rating	Goal	Justification for Rating, Goal and Indicator
Sustainable Use of Fish, Reptile and Wildlife Resources in the Region	**Poor**	**Fair**	**Justification:** Given the level of exploitation of fish, reptile and other wildlife in the CBS, but more so in the Mussel Creek drainage, populations of hicatee, green iguana, Morelet's crocodile and fishery stocks in Mussel Creek have plummeted in recent years.
			Goal: Fair. There are great external pressures and markets that are impacting the fish, reptile and wildlife species in and around the CBS. Ecological recovery will take time as enforcement of illegal activities curbs excessive harvests and management plans can be put in place.
			Indicators: Ending of the use of gill nets in Mussel Creek, night surveys of crocodiles showing population increases and monitoring of local fish harvests from local fishers.

Table 22. A summary of conservation target viability assessments for the five CBS targets.

CBS Conservation Targets – Indicators for Viability Ranking			
Conservation Target	Current Rating	Goal	Justification for Rating, Goal and Indicator
Protection of Lands Linked to the Northern Biological Corridors in Belize	**Fair**	**Good**	**Justification:** As the nation of Belize grows and faces increased pressure to clear forests and convert existing natural ecosystems, protected areas cannot be viewed in isolation. The CBS needs to increase its physical and ecosystem linkages with adjacent protected areas and private lands along the Northern Biological Corridor. The CBS has a role to play in terms of its ecosystems and its capacity to manage private lands.
			Goal: Good. There are immediate opportunities to expand the CBS, manage lands adjacent to the CBS and create management zones in the region.
			Indicators: The number of effective working partnerships with regional stakeholders, zone based management in the Belize River Valley and increased and enhanced conservation planning on private lands outside the CBS in the region.

CBS Conservation Targets – Indicators for Viability Ranking			
Conservation Target	Current Rating	Goal	Justification for Rating, Goal and Indicator
Development of a Comprehensive Pledge System to Achieve Conservation Targets	**Good**	**Good**	**Justification:** The voluntary pledge system has been the core management approach at the CBS and it is widely known and respected. While pledge updating needs to be done within the CBS, this does not mean the voluntary land management pledge system can't be expanded to encompass other land management conservation objectives other than black howler monkey habitat protection.
			Goal: Good. The CBS pledge system is in place and there is existing capacity in how to review and develop conservation plans at the CBS. There is no reason it cannot be expanded to achieve the same levels of conservation success that have been found in the CBS.
			Indicators: The number of new pledges in the various new management zones around the CBS in the Belize River Valley.

3.2 Threats to Biodiversity

In this section, the main threats to biodiversity in and around the CBS are reviewed. Background on each threat is presented followed by an assessment based on the following criteria (NPAPSP 2005):

Area Rate the area of the threat (how much of the conservation target area it affects) using the following rankings – each ranking is associated with a score that is incorporated into the analysis

Proportion of Area Affected Ranking		
Criteria	**Score**	
Area	**4**	Will affect throughout >50% of the area
	3	Widespread impact, affecting 26 – 50% of the
	2	Localized impact, affecting 11 – 25% of the area
	1	Very localized impact, affecting 1 – 10% of the

Severity Rate the severity of the threat – how intense or great the impact is - using the following rankings:

Severity Ranking		
Criteria	**Score**	
Severity	**3**	Local eradication of target possible
	2	Substantial effect but local eradication unlikely
	1	Measurable effect on density or distribution
	0	None or positive

Urgency What is the likelihood of the threat occurring over the next five year? This can be ranked on a scale of:

Urgency Ranking		
Criteria	**Score**	
Urgency	**3**	The threat is occurring now and requires action
	2	The threat could or will happen between 1 – 3
	1	The threat could happen between 3 – 10 years
	0	Won't happen in > 10 years

Deforestation

Over the 30 year period from 1980 to 2010, Cherrington et al. (2010) reported that 17.4% of forest area in Belize was deforested. This corresponds to an annual rate of deforestation of 0.6%. In absolute numbers, this translates to 725,173 acres of forest cover loss with an average forest loss per year of 24,835 acres. An FAO (2001) study reported that Belize's deforestation rate increased to -2.3% per year within the 1990 to 2000 timeframe. Sader et al. (2002) reported an annual clearing rate of -0.6% per year during the 1990s for Belize and an overall forest cover in 1998 of 78.5%.

Specific studies have also been done focusing specifically at forests along the Belize River and those in and around the CBS. Di Fiore (2002) found that forest cover along the entire Belize River corridor was reduced from 40% of the total land area in 1989 to 31% in 2001. The study measured a 22% (7,200 ha) reduction from the forest that was present in 1989, or a yearly 2% deforestation rate, which also roughly agrees with the FAO (2001) results for Belize as a whole.

Region 9 in Di Fiore's (2002) study specifically analyzed the forests in and immediately adjacent to CBS lands along a 2.07 km (1.29 mile) buffer on each side of the river. She reported that in this region in 2001, the area was 30% forested and had shown a 12% decrease in forest cover from 1989 to 2001 (a rate of ~1% decrease per year). More significantly, Di Fiore reports a 34% reduction in forest cover along a 90 m buffer zone along the Belize River in region 9. The latter result corresponds to a rate of 2.83% forest loss per year.

Wyman (2008) reported that that overall deforestation within the 15 year time period from 1989 to 2004 in the CBS (8,704 ha) showed a 23.4% decrease. The spatial pattern of the deforestation is shown in Figure 16. Wyman (2008) also analyzed and compared forest changes along a 500 meter river buffer and reported a 23.7% decrease in forest cover in the buffer. The spatial pattern of the deforestation along the buffer is shown in Figure 17. Table 22 summarizes the deforestation rates in and around the CBS and across Belize from these various studies. Overall, the average deforestation rate across studies in the CBS across 1989 to 2004 was 1.75%.

Table 23. A comparison of yearly deforestation rates in Belize and in and around the CBS.

Study	Time Span	Average National Deforestation Rate per Year	CBS Deforestation Rate per Year	Comments
FAO (1993)	1980 - 1990	0.2%	-	
FAO (2001)	1990 - 2000	2.3%	-	
Cherrington et al. (2010)	1980 - 2010	0.6%	-	
These are more detailed time assessment by Cherrington et al. (2010)	1980 - 1989	0.3%	-	
	1989 - 1994	1.4%	-	
	1994 - 2000	0.9%	-	
	2000 - 2004	0.9%	-	
	2004 - 2010	0.3%	-	
Meerman et al. (2010)	1990 - 2005	0.6%	-	
Di Fiore (2002)	1989 - 2001	-	1.0%	2.07 km buffer on Belize River
Di Fiore (2002)	1989 - 2001	-	2.8%	90 m buffer on Belize River
Wyman (2008)	1989 - 2004	-	1.6%	8,704 ha CBS region
Wyman (2008)	1989 - 2004	-	1.6%	500 m buffer on Belize River
Average Deforestation Rates		**0.83%**	**1.75%**	

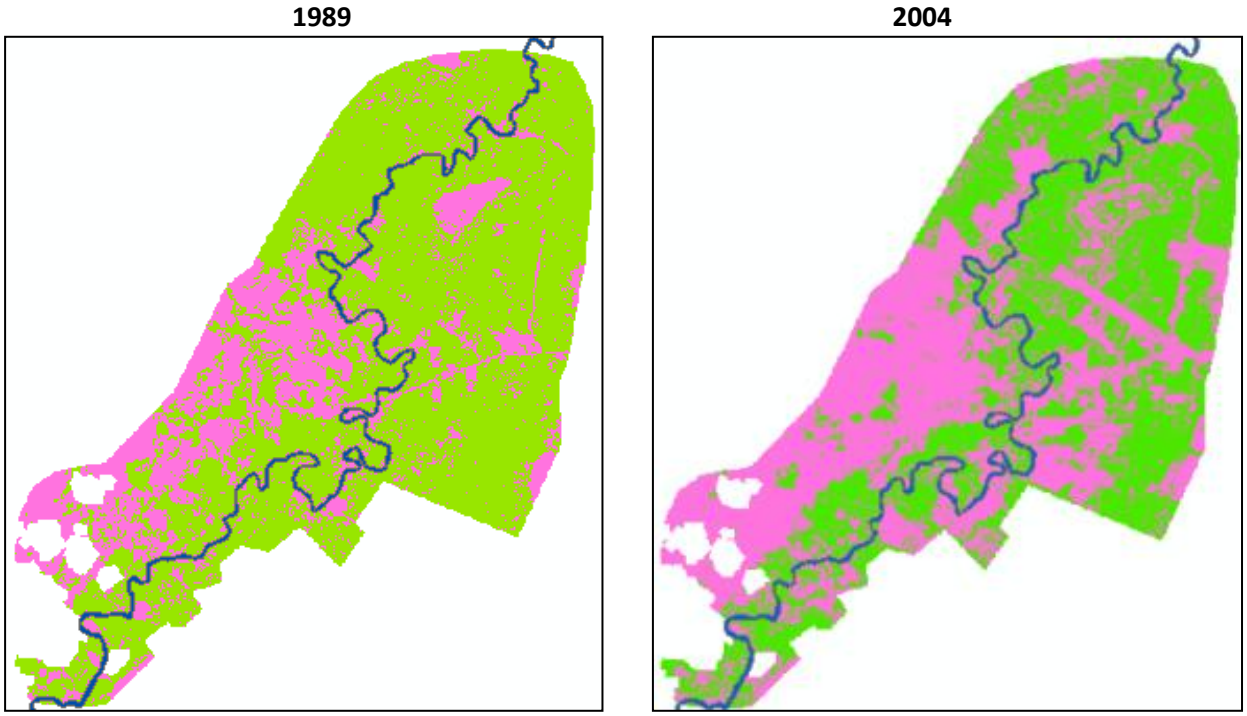


Figure 16. A comparison of forest cover (green) and cleared forest (pink) in 1989 versus 2004 on an 8,704 ha region in and around the CBS (Wyman 2008). Wyman reported a 23.4% decrease in forest cover over that time span in this area.

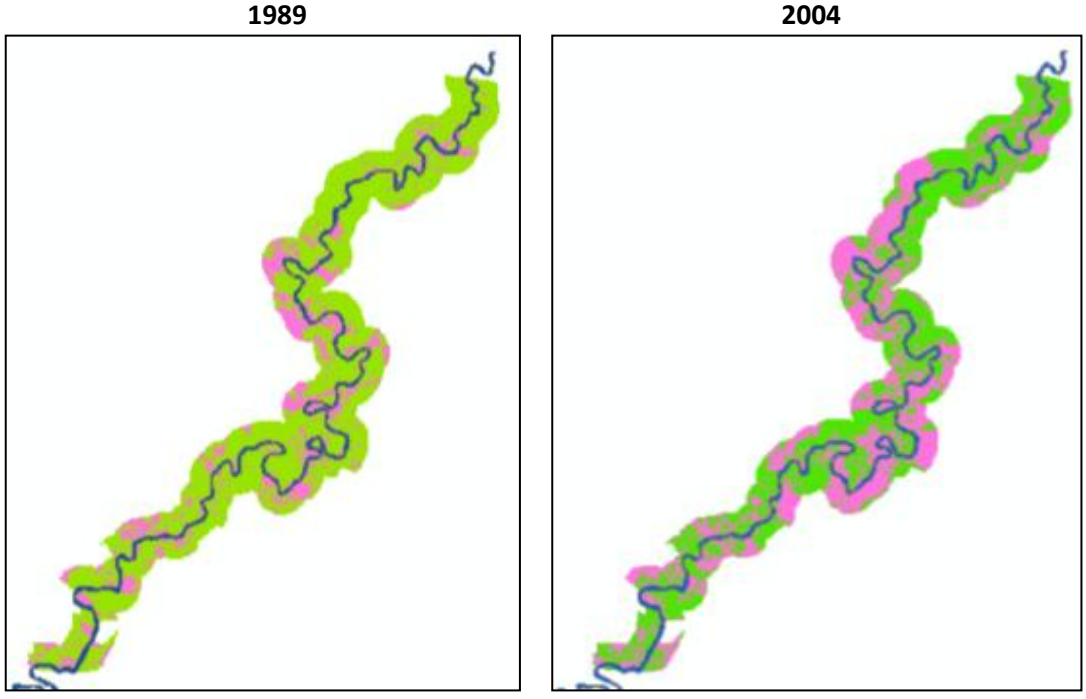


Figure 17. A comparison of forest cover (green) and cleared forest (pink) in 1989 versus 2004 along a 500 m buffer along the Belize River (Wyman 2008). Wyman reported a 23.7% decrease in forest cover over that time span along the buffer.

Based on the information available about deforestation in the CBS, a threat evaluation was developed and is presented in Table 24.

Table 24. A threat evaluation of deforestation in the CBS.

Threat : Deforestation		
Ongoing pressure to convert existing forests into pastures, agricultural clearings, homes and open areas		
Status	**Active**	
Target	**All Forest Types:** While most prevalent in the riparian forest corridors, deforestation is a threat for all forested ecosystems including all broadleaf forests, cohune forest and pine savanna.	
Source	**Direct:** Landholders are utilizing their property **Indirect:** Lack of alternative economic opportunities in area	
Area	**Score = 4**	Deforestation, albeit at a small-scale on most individual landholdings, is widespread in the CBS effecting >50% of landholdings.
Severity	**Score = 2**	Severity has been substantial in the past two decades but is not a crisis at this time and it can be reversed. Given that the management unit is the individual landholding, severity is not consistent across the CBS; there are some areas under extreme pressure and others virtually under protection.
Urgency	**Score = 1**	Howler populations are still thriving so there is not an immediate threat but in the next 3-10 years this will have to be addressed.
Management Actions	Re-pledging CBS landowners and updating and creating new property maps and conservation plans; Regular (every 1-2 years) monitoring of new management plans.	

Forest and Habitat Fragmentation

Linked to the impacts of deforestation is the threat of excessive forest and habitat fragmentation. Forests that are relatively undisturbed have a continuous canopy, tend to be dark under the canopy, more humid, have stable temperature and experience lighter winds (Laurence et al. 2002). Fragmentation of these large tracks of continuous forest creates forest edges with increased temperatures, reduced humidity and increased sunlight. These so-called "edge effects" can impact from 40 to 100 m deep in the forest depending on slope, topography and forest type (Didham and Lawton 1999). These edge effects can have strong impacts on the flora and fauna found in the forest fragments and patches. Fragmentation linked with deforestation can also impact regional micro-climates. Ray et al. (2006) found that dry season deforested habitats had higher daytime temperatures, were less cloudy and had lower estimated soil moisture. The result is hotter and drier air over deforested regions, with lower values of cloud formation and precipitation. Overall, their results suggest that deforestation is locally intensifying the dry season, increasing the risk of fire, especially for the long corridor connecting regions.

Because of all the reasons noted above, and the consequent loss or alteration of wildlife habitat caused by fragmentation, it should be keep to a minimum if at all possible.

Based on an evaluation of the conditions in the CBS, including the aerial survey conducted in March 2012, a threat evaluation for forest and habitat fragmentation was developed and is shown in Table 25.

Table 25. A threat evaluation of forest and habitat fragmentation in the CBS.

Threat : Forest and Habitat Fragmentation		
Ongoing pressure to convert existing forests into pastures, agricultural clearings, homes and open areas		
Status	**Active**	
Target	**All Forest Types:** While most prevalent in the riparian forest corridors, deforestation is a threat for all forested ecosystems including all broadleaf forests, cohune forest and pine savanna.	
Source	**Direct:** Landholders are utilizing their property **Indirect:** Lack of alternative economic opportunities in area	
Area	**Score = 4**	Deforestation, albeit at a small-scale on most individual landholdings, is widespread in the CBS effecting >50% of landholdings.
Severity	**Score = 2**	Severity has been substantial in the past two decades but is not a crisis at this time and it can be reversed. Given that the management unit is the individual landholding, severity is not consistent across the CBS; there are some areas under extreme pressure and others virtually under protection.
Urgency	**Score = 1**	Howler populations are still thriving so there is not an immediate threat but in the next 3-10 years this will have to be addressed.
Management Actions	Re-pledging CBS landowners and updating and creating new property maps and conservation plans; Regular (every 1-2 years) monitoring of new management plans.	

Overexploitation of Fish, Reptile and Wildlife Species

Hunting for game has been part of life in the Belize River Valley for generations. Hartup (1994) reported that in 1988, 65% of villagers surveyed in the CBS said that they hunted and over 50% of the respondents these more than once a month. In 2000, the GOB enacted a fine of $2,000 for hunting without a license. Because licenses were difficult to obtain, landowners expressed dismay over the effective prohibition of hunting (Lash 2003). However, Jones and Young (2004) report in their 2000 study that hunters in CBS still hunted from 1-3 times a week to “almost never”.

The more recent threat of overexploitation of fish, wildlife and reptile species is occurring in the Mussel Creek drainage where external fishing and hunting pressures are the main drivers of exploitation. Fishing operations, including the extensive use of gill netting are occurring illegally and frequently in the drainage, typically by fishermen from outside the Belize River Valley. Markets outside the region are helping drive the exploitation and very ineffective enforcement has taken place. This activity has not only depleted fish stocks in Mussel Creek, it has apparently decimated the adults Morelet’s crocodile population in the area.

Although hunting pressure on bush meat and other edible species, including green iguana, is not as acute as the situation in Mussel Creek, better monitoring of exploitation of these species is needed. An overall threat evaluation of overexploitation of fish, reptile and wildlife species in the CBS is provided in Table 26.

Table 26. A threat evaluation of overexploitation of fish, reptile and wildlife species in the CBS.

Threat : Overexploitation of Fish, Reptile and Wildlife Species		
Ongoing pressure on local fisheries, reptile and wildlife species		
Status	**Active**	
Target	**All Terrestrial and Aquatic Systems:** The threat is most prevalent in the riparian forest corridor, in the Belize River and most significantly the Mussel Creek drainage.	
Source	**Direct:** Non-local fishing and hunting pressure; to a lesser extent local pressure **Indirect:** Growth of markets for endangered species and large-scale exploitation	
Area	**Score = 4**	There is pressure on both individual landholdings as well as on lands outside the CBS, the threat is spread across the regions effecting >50% of the Belize River Valley region.
Severity	**Score = 2**	In the past 5 years there has been strong external fishing and hunting pressures on fish, reptiles and wildlife. In particular, fisheries in Mussel Creek, hicatee and Morelet's crocodile. To a lesser extent, there has been pressure on the green iguana and various popular bush meat species. There is also a growing trend in the savanna areas to harvest parrots .
Urgency	**Score = 3**	There is an immediate threat in Mussel Creek and a growing threat elsewhere.
Management Actions	Create an active Mussel Creek Task Force that includes local residents of Scotland Half Moon adjacent to Mussel Creek, CBS and the Forestry and Fisheries Departments; Also begin preparing plans immediately to explore creating Mussel Creek as an IUCN Category VI Protected Area.	

Hurricanes, Tropical Storms and Flooding

Belize is prone to various natural hazards, including hurricanes, tropical storms and floods as well as periodic drought. Between 1970 and 2008, hurricanes, tropical storms and floods affected more than 300,000 people in Belize, resulted in 69 deaths, and caused more than US $526 million in economic damage (Belize National Meteorological Service). This vulnerability to natural hazards in the lower Belize River Valley is due the large majority of its population (households) and economic activity (mainly shops, agriculture and tourism) being adjacent to an exposed low lying coastal zone, as well as being on the flood-prone banks of the Belize River system.

Three Category 3 hurricanes, 2 Category 4 hurricanes, 2 Category 5 hurricanes affected Belize during the period (1889-2008). That corresponds to a threat as follows:

- Tropical storm every 4.4 years
- Category I hurricane every ~ 12 years
- Category II hurricane every ~ 16 years
- Category III hurricane every ~ 35 years
- Category IV hurricane every ~ 40 years
- Category V hurricane every ~ 50 years

Since June, 2000, five tropical cyclones have affected Belize. Table 27 provides a threat evaluation of hurricanes, tropical storms and flooding.

Table 27. A threat evaluation of hurricanes, tropical storms and flooding.

Threat : Hurricanes, Tropical Storms and Flooding		
Ongoing threat that while not controllable, needs to be prepared for		
Status	**Active**	
Target	**All Terrestrial and Aquatic Systems:** Tropical storms and flooding are always threats in the regions	
Source	**Direct:** Direct mortality and injury **Indirect:** Population declines due to subsequent loss of habitat	
Area	**Score = 3**	While flooding does not significantly impact each Village in the Belize River Valley equally, the impact is widespread nonetheless with certain areas (regions of Flowers Bank and Scotland Half Moon).
Severity	**Score = 1**	The impacts on conservation targets are likely to be short-lived, though the greater intensity of the storm or event, the greater the impact. This is why it is essential to maintain large viable populations of targeted species so that they can be better buffered from storm and/or flooding impacts. It should also be noted that storms also can have a negative impact on tourism revenue generation.
Urgency	**Score = 1**	Storm events are extremely difficult to predict
Management Actions	It is difficult to prepare effective management actions for mitigating the impacts of intense storms and/or flooding on biodiversity. The main management actions revolve around maintaining as healthy and viable populations as possible of targeted species (e.g., black howler monkeys) so they will be more resilient to the impacts of storm events. However, areas that are prone to flooding should me mapped and any programmes and/or projects implemented in those areas need to take this into consideration prior to development.	

Petroleum Exploration and Exploitation

The Organization of American States (2011) describes the petroleum section in Belize as follows:

> "The petroleum sector is governed by the Petroleum Act, Chapter 225 of 2000 Revised Edition 2000-2003 and the Petroleum Regulations. The Geology and Petroleum Department (GPD) is the Government agency responsible for the administration of the Petroleum Sector. The Inspector of Petroleum of the GPD is directly responsible for the administration of the Petroleum Sector under the Petroleum Act and Regulations.
>
> Petroleum contracts are issued to qualified petroleum companies to explore for and produce petroleum. The type of contract utilized in Belize is an exploration and production contract. The exploration period is for a total of 8 years and is divided into four renewable 2 year periods: an initial exploration period, a first renewal period, a second renewal period and a third renewal period. Each period expires at the end of the two years and the contractor must apply to the Minister for renewal. Renewal is automatically granted if the Contractor fulfilled its work and expenditure commitments."

Currently Belize is divided into 10 km square petroleum contracts (Figure 18). While there is no immediate threat from petroleum development in or immediately adjacent to the CBS, petroleum exploration needs to be evaluated in terms of both immediate potential threats to current CBS landholdings, but also threats to the broader areas in the Belize River Valley that comprise the new broader, regional management zones being proposed for the CBS.

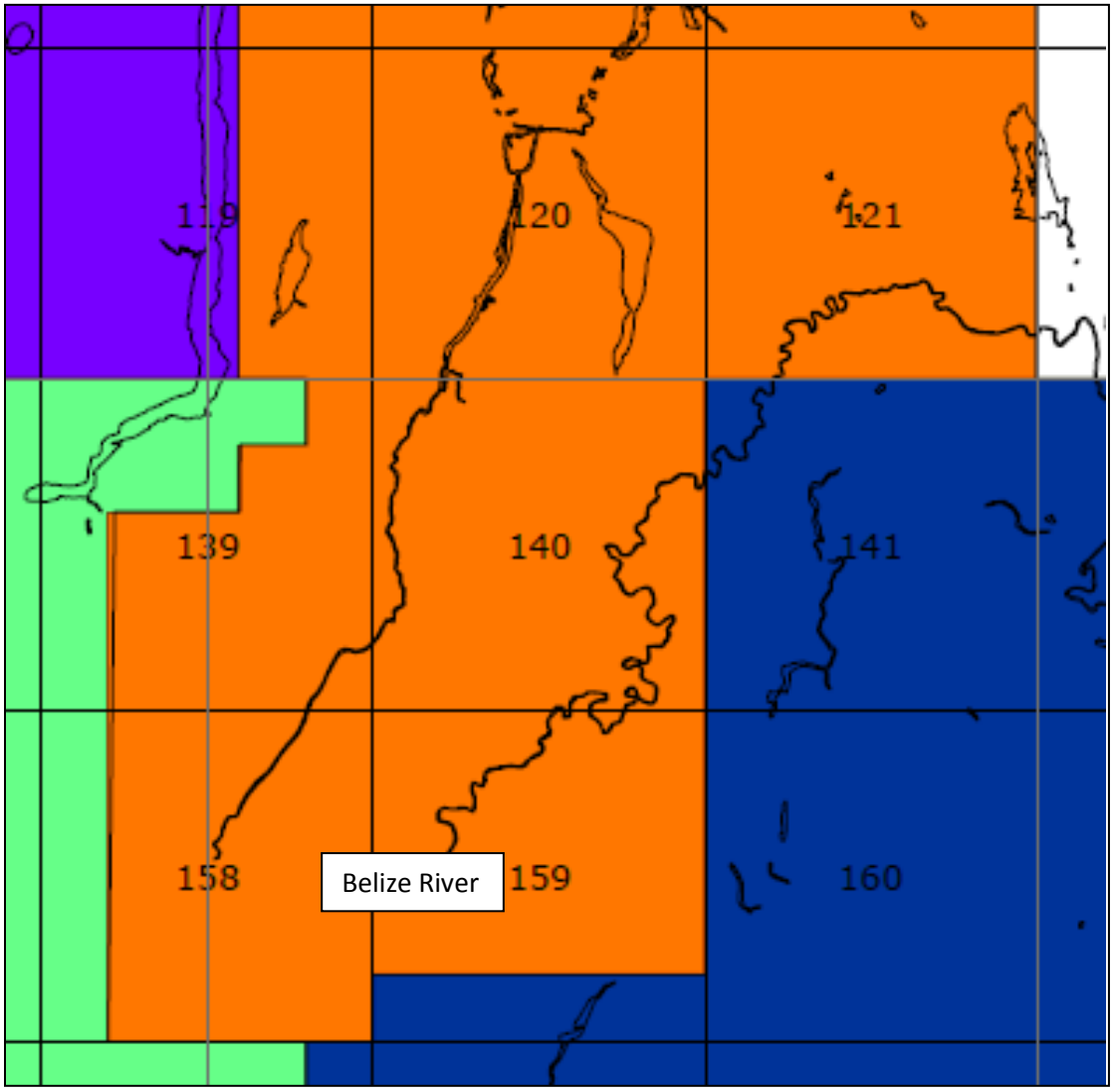


Figure 18. The map shows the 10 km square Belize Petroleum Contracts for Belize in the CBS region. The orange blocks (120, 121, 140, 159 and portions of 139 and 158) are for Perenco Belize Ltd; the dark blue blocks (141, 160 and part of 159) are for BCH International Inc.; the light green blocks (part of 139 and 158) are for Northern Spirit Resources; and the purple blocks (part of 119) are for West Bay Belize Ltd. This map has been excerpted from a nationwide map of petroleum contracts prepared by Geology and Petroleum Department, Ministry of Natural Resources and the Environment in May 2010.

Based on the considerations noted above, a threat evaluation was performed and the results are presented in Table 28.

Table 28. A threat evaluation of petroleum exploration and exploitation.

Threat : Petroleum Exploration and Exploitation		
Ongoing potential threat due to GOB encouragement of oil exploration in Belize		
Status	**Active**	
Target	**All Terrestrial and Aquatic Systems:** All terrestrial and aquatic systems are potentially impacted by oil exploration but especially by exploitation and active wells.	
Source	**Direct:** Loss of habitat, pollution and spill impacts **Indirect:** GOB encouragement of additional explorations for oil in country	
Area	**Score = 4**	Given the extent of petroleum contracts in Belize, the entire Belize River Valley could be impacted. However, exploitation of oil would not likely be widespread.
Severity	**Score = 1**	Given that there are no active oil drilling operations in the CBS area, it is difficult to quantify the severity of the threat. Again, it is more likely to be site specific and be associated with exploration or exploitation activities in a specific area or around a specific well head.
Urgency	**Score = 1**	There are no immediate threats
Management Actions	Management actions need to be proactive rather than reactive. Some advanced planning needs to be conducted so the CBS knows how to respond to potential oil exploration threats and needs to help guide and inform those efforts such that they are not encouraged if the threat is too great or modified such that there impact is minimalized.	

Wildfire Threat

The 2011 Belize wildfire provisional report (Meerman 2011b) estimates that some 86,400 ha / 213,500 ac of forest burned (3.76% of Belize) and some 61,200 ha / 151,200 acres of savanna and pine forest burned in 2011 (2.67% of Belize). Thus an estimated total of 6.43% of the total land area of Belize was burned, though this is likely a very low estimate.

Within the lands and properties that constitute the CBS, and based on 2012 surveys, both aerial and on the ground, it is estimated that **75% of the CBS lands experienced at least moderate levels of fire** during the 2011 Belize wildfires. A map of the approximate extent of the fire damage is shown in Figure 19. It should be noted that many of the areas west of the Belize River shown in Figure 19 were 'pine ridge' and savanna areas with limited forest cover.

The circumstances surrounding the 2011 wildfires were somewhat unique. On October 24, 2010, Hurricane Richard, a category I storm, made landfall and traveled through central Belize. It left extensive damage to the forests of the region and left a great deal of dead woody debris on the ground and standing dead in the canopy in its wake. The next year, the dry season was particularly dry and this led to the set of conditions that led to the catastrophic fires of 2011. Meerman (2011a) notes that while rainfall in November 2010 was about average, the following months (with the exception of February 2012) were dryer than average. Effectively the dry season started in December extending the dry season from about 4 months to 6 months. The total period of October 2010 through May 2011 ended with an amount of rainfall which was only 76% of a 17 year average.

This does point to the need to understand the potential role of wildfire in altering both ecosystems as well as the human agricultural and socio-economic landscape. It points to the need for both preventative measures and better fire fighting strategies (e.g., creating burn lines to prevent property and habitat, back fires and fire lines). Though catastrophic fire is unlikely to be effectively contained, smaller fires may be much more controllable and efforts need to be made to have fire suppression strategies, mechanisms and village-based programmes in place going forward.

In the CBS, the protection of the individual landholder forests, milpas, pastures, fruit trees and other natural assets in inextricably linked to the protection of wildlife habitat and as such, promotion of a fire suppression and control programme is to the benefit of both local landholders and local wildlife.

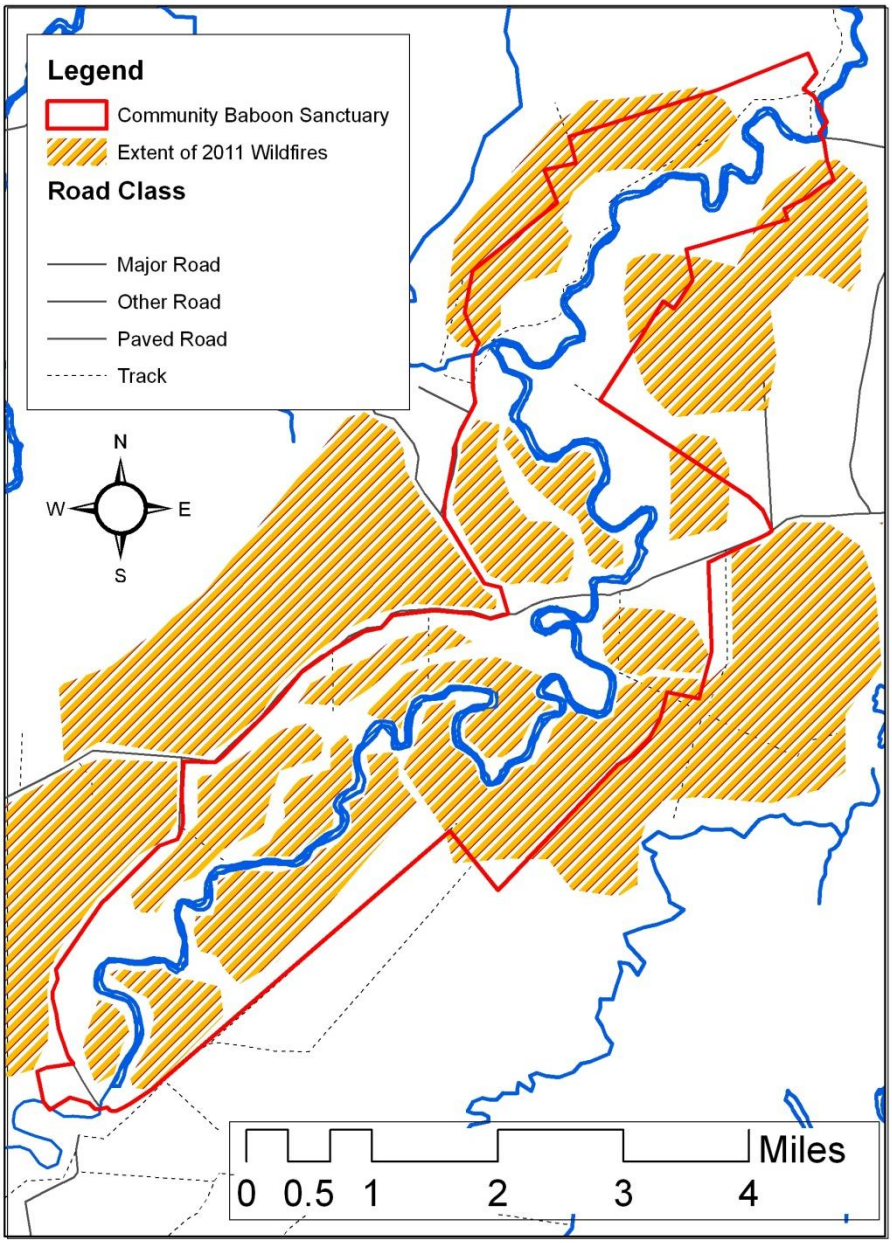


Figure 19. A map showing a rough estimate of the extent of damage from the 2011 wildfire in the CBS. The severity of the fire impacts was highly variable across the region and no indication of severity is noted on the map.

In trying to predict any future risks from wildfire, some estimate of future fire risk can be gleaned from the wildfire risk map produced by Meerman (2004). This map categorizes fire risk into various levels. A map showing the fire risks in the CBS is shown in Figure 20. This Figure shows that the fire risk ranges from moderate to extreme across the CBS. Overall 40.6% of CBS lands are at moderate risk, 26.9% at medium risk, 30.8% at high risk and 1.7% at extreme risk.

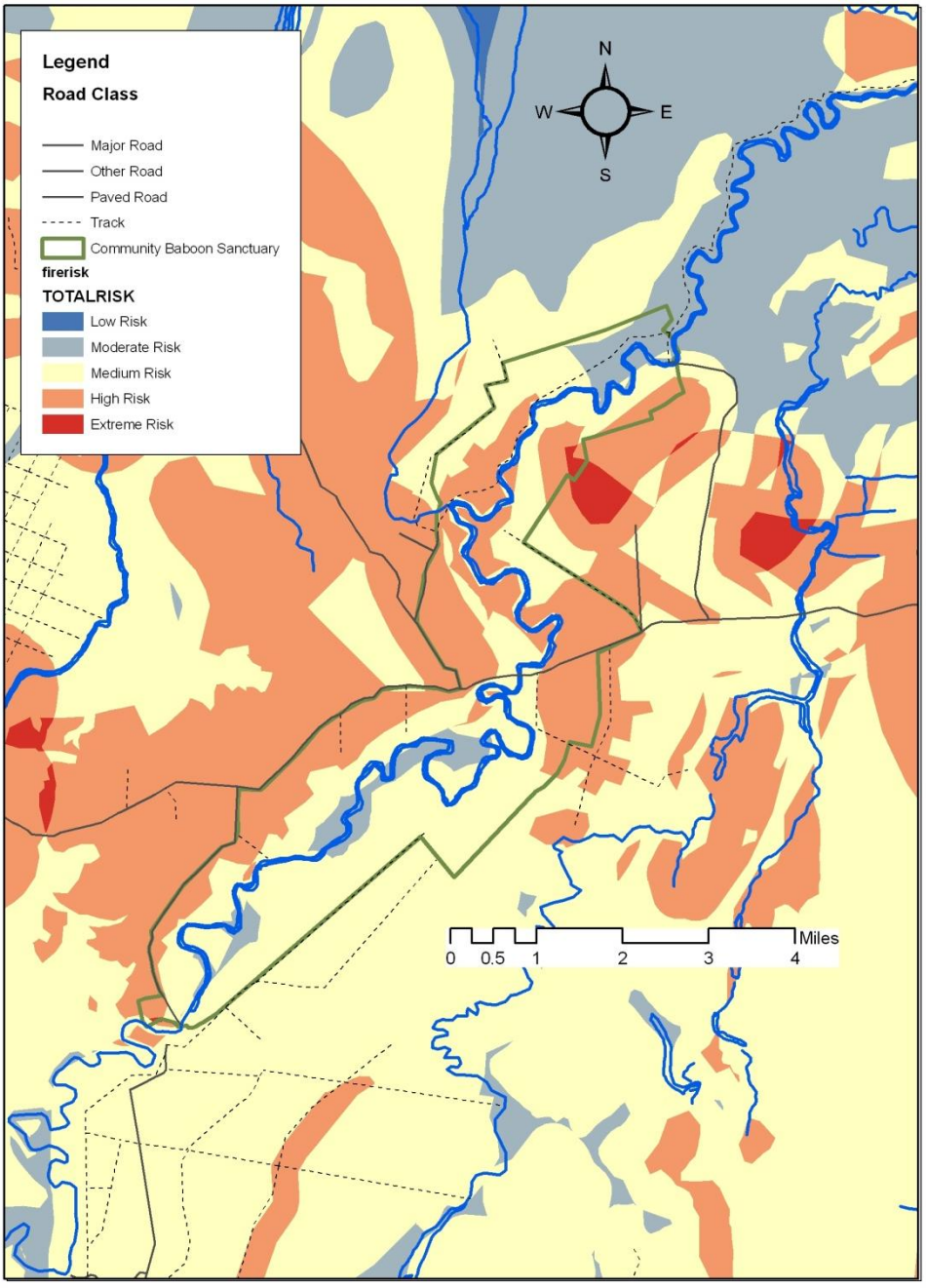


Figure 20. A map showing potential fire risk in the CBS (based on Meerman 2004).

Based on the information concerning wildfire threats in and around the CBS, a threat evaluation of uncontrolled fire was developed and is shown in Table 29.

Table 29. A threat evaluation of uncontrolled wildfire.

Threat : Uncontrolled Wildfire Risk		
Ongoing potential threat		
Status	**Active**	
Target	**All Terrestrial and Agricultural Systems:** All terrestrial and agricultural systems and in many cases homes, are potentially impacted by the threat of wildfires.	
Source	**Direct:** Loss of habitat, agricultural crops and livestock and homes **Indirect:** Climate change could increase the risk going forward	
Area	**Score = 4**	Given the extent of the moderate to high wildfire risk in the CBS (Figure 17) and the extent of the 2011 fires (Figure 16) clearly greater than 50% of the CBS is under risk of future wildfires.
Severity	**Score = 1**	The long-term impacts of fires are not well studied; the existence of slash and burn agricultural practices have occurred and forest regeneration has not been impacted, so fire damage impacts are likely to be temporary in the long term.
Urgency	**Score = 1**	Predicting drought, fires and tropical storms is difficult. Thus, the need for proactive planning.
Management Actions	Developing village-based fire prevention and fire suppression programmes would benefit landowners, property, livestock and wildlife. Given the recent events of 2011, there is an opportunity to discuss managing milpa and pasture fires and having a proactive programme for fire suppression. This could be included in landowner management plans.	

Free Ranging Cattle

The issue of clearing forest for pasture was previously discussed and encompassed under the broader threat of deforestation due to land conversion, in this case for pasture. However, a second issue concerning cattle also exists and this concerns the impact of free-ranging cattle (and other livestock) in the Belize River Valley. Currently there is a survey taking place identifying the number of cattle, both penned and free-range and results from that study will supplement the management plan to get a better appreciation of the extent and level of threat or impact that the free ranging cattle pose.

There are several ways in which free ranging cattle can impact biodiversity and wildlife habitats in the CBS and they are summarized below.

- Access to Water – the requirement for cattle to have access to water means that in pastures and for free range cattle, forests immediately along the Belize River and other streams are cleared directly to the bank in violation of the law that protects a 66 ft buffer strip along all water courses. This is basically deforestation but also includes erosion due to cattle traffic and heavy herbivory pressure on any natural tree seedling re-growth.
- Food Competition – In some instances, cattle are competing with native wildlife for food sources (e.g., fruits from bay cedar, tubroos) and also potentially trampling many other food sources for other species of mammal, reptile and insects.
- Manure Management – the extent of manure spread across the region can have a negative aesthetic impact for tourism but also forces individuals in the area to clean their properties to move freely, avoid potential transmission of diseases to humans (health risks) and to use community lands for sports and recreation.
- Feeding on Crops and Backyard Gardens – This has an impact on agriculturally based community development projects sponsored by the CBS (e.g., organic vegetable farming) but cattle may also negatively influencing grazing areas for pigs, chickens, turkeys and other domesticated animals as well as hamper any forest restoration programmes.

Based on these concerns, a threat evaluation was conducted for free ranging cattle and it is presented in Table 30.

Table 30. A threat evaluation of free ranging cattle.

Threat : Free Ranging Cattle		
Ongoing potential threat due to movement of free ranging cattle across all CBS lands		
Status	**Active**	
Target	**All Terrestrial and Agricultural Systems:** All terrestrial and agricultural systems are potentially impacted by the grazing and land disturbance caused by free range cattle.	
Source	**Direct:** Loss of habitat, erosion, crop loss **Indirect:** Cattle are a form of savings account that many families use in emergencies; it is also allowed under the Village Councils Act	
Area	**Score = 4**	Given the extent of free ranging cattle throughout all lands and forest types of the CBS, the impact of cattle is clearly much greater than 50% of the CBS area.
Severity	**Score = 2**	Cattle herbivory impacts the regeneration of forest seedlings, increases soil disturbance and erosion, cattle are often competing for food sources with native herbivore species. The impacts are chronic and widespread.
Urgency	**Score = 3**	The threat is immediate and widespread.
Management Actions	Re-visit the local policy of allowing free-range cattle; encourage penning of animals; fencing off critical areas to allow for regeneration (cattle exclusion zones)	

Lack of Sufficient Economic Activity in the Belize River Valley

In most protected areas in Belize, the lack of economic activity puts pressure on residents adjacent to a protected area to exploit resources within the protected area for economic gain. Thus, in these situations there is a legally independent and geographically distinct protected area that is separate from the individual landholding. In the CBS, this is not the case. Individual landholdings in the CBS not only make up the protected area, but given that the CBS is based on voluntary participation, there are no formal legal protections. The protected area itself is thus impacted directly.

Given these unique realities, lack of sufficient economic activity is a direct threat to the conservation objectives of the CBS. Furthermore, the eco-cultural tourism and community development programmes initiated by the CBS are in place to provide economic activity and income (directly and indirectly) such that CBS and related economic activity serve the purpose of: (1) reducing pressures on clearing additional lands for subsistence and/or small-scale agricultural activities; (2) reducing pressure on hunting of local game and fishing in local fisheries; and (3) reducing pressures on pledged landowners to not follow their conservation plans.

Given this reality, a threat evaluation of the lack of sufficient economic activity in the Belize River Valley was conducted and is presented in Table 31.

Table 31. A threat evaluation of the lack of sufficient economic activity in the Belize River Valley.

Threat : Lack of Sufficient Economic Activity		
Ongoing potential threat due to economic pressures to convert habitat for immediate economic benefit; Individual landholdings in the CBS are the protected area, there is no buffer.		
Status	**Active**	
Target	**All Terrestrial and Aquatic Systems:** All terrestrial and aquatic systems are potentially impacted due to influence of increased land conversion and increased natural resource use and consumption.	
Source	**Direct:** Loss and/or conversion of habitat; increased hunting and fishing pressure **Indirect:** Lack of comprehensive regional planning and effective economic development programmes in the Belize River Valley	
Area	**Score = 4**	Given that the CBS is comprised of individual landholdings, the lack of sufficient economic activity will potentially impact much greater than 50% of the CBS.
Severity	**Score = 1**	The level of severity on biodiversity will be positively correlated to the severity of the economic situation in the Belize River Valley. There may be a measureable impact now on the density and distribution of wild game, fish and reptile species but the severity level is not critical.
Urgency	**Score = 3**	Due to the global economic downturn and the economic situation in Belize and the Belize River Valley in particular, even though it may take time to improve economic opportunities, the work by the CBS needs to begin now.
Management Actions	Enhance community development and eco-cultural tourism programmes; be more vigilant in working with landowners in updating management plans; create and maintain an updated database on all economic activities in and around the CBS.	

Lack of Adequate Educational Opportunities in the Belize River Valley

One of the long-term challenges in the villages of the CBS and surrounding Belize River Valley is to provide the local children with quality basic schooling and adequate educational opportunities. The structure of the local amalgamated schools was discussed in **Section 2.6.5**. These are highly important both for students in that it facilitates their employment in other sectors than small-scale agriculture and subsistence hunting and fishing and it provides them with capacities to become sustainable development pioneers in the Belize River Valley. This ties in directly with the education mission of the CBS.

Based on the importance of providing adequate educational opportunities, a threat evaluation of the lack of adequate educational opportunities in the Belize River Valley was conducted and is presented in Table 32.

Table 32. A threat evaluation of the lack of adequate educational opportunities in the Belize River Valley.

Threat : Lack of Adequate Educational Opportunities		
Ongoing potential threat due to lack of adequate school preparation for Belize River Valley students.		
Status	**Active**	
Target	**All Terrestrial and Aquatic Systems:** All terrestrial and aquatic systems are potentially impacted due to influence of increased land conversion and increased natural resource use and consumption.	
Source	**Direct:** Lack of adequate school preparation for a diversity of job opportunities for students in the Belize River Valley **Indirect:** Loss and/or conversion of habitat; increased hunting and fishing pressure	
Area	**Score = 4**	The amalgamated schools involve all students across the Belize River Valley so all residents and villages are impacted.
Severity	**Score = 1**	No effort to date has been made to quantify the impact of sometimes inadequate schooling on biodiversity loss, but increasing employment opportunities other than subsistence agriculture or hunting would benefit biodiversity protection.
Urgency	**Score = 3**	Education is at a level in the Belize River Valley where improvement is needed, even though it may take time to improve educational opportunities, the work by the CBS needs to begin now.
Management Actions	Partner with schools to develop a regional education plan; CBS financial and logistic support for existing school programmes and infrastructure; form national and international partnerships to garner resources, training and capacity building opportunities for teachers and school administrators.	

3.3 Strategies to Reduce Threats

Table 33. Identified threats to biodiversity and natural resources in the CBS and strategies and actions to reduce threats.

		THREATS								
Cross-Cutting Strategies to Reduce Threats	**Links to 2011 Strategic Plan**	Deforestation	Fragmentation	Overexploitation	Storms	Petroleum	Fire	Cattle	Economics	Education
Re-structuring, capacity building and institutional strengthening of CBS management	Institutional Strengthening	■	■	■	■	■	■	■	■	■
Updating/Maintaining CBS Landowner Database; regular monitoring of landowner management plans	Protected Areas Management	■	■					■		■
Yearly (or every two years) flyover and videotaping of conditions in the CBS	Protected Areas Management	■	■		■	■	■	■		■
Create an active Mussel Creek Task Force that includes local residents of Scotland Half Moon adjacent to Mussel Creek, CBS and the Forestry and Fisheries Departments	Protected Areas Management			■						■
Explore creating Mussel Creek as an IUCN Category VI Protected Area	Protected Areas Management	■	■	■				■	■	■
Explore the use of special constables in the enforcement of environmental laws and statutes	Protected Areas Management			■				■		■
Flood mapping and flood preparedness	Education				■			■	■	■
Fire preparedness and response planning	Protected Areas Management	■	■				■		■	■
Enhance CBS eco-cultural tourism programme and increase tourist visitation to CBS villages	Eco-Cultural Tourism Development	■	■	■	■	■	■	■	■	■
Develop and implement an eco-cultural tourism marketing plan		■	■	■	■	■	■	■	■	■
Development community agreement to not clear 66 ft buffer along Belize River	Protected Areas Management	■	■	■	■		■	■		■
Create and maintain an updated database on all economic activities in and around the CBS	Eco-Cultural Tourism Development								■	■
Partner with area schools to develop curriculum and activities for conservation and sustainable development	Education									
Re-visit the local policy of allowing free-range cattle; encourage penning of animals	Public Awareness	■	■					■		
Create specific management zones in and around the CBS to manage aspects of different areas	Protected Areas Management	■	■	■		■		■	■	
Develop specific management plans for each zone	Protected Areas Management	■	■	■		■		■	■	
Expand CBS towards Labouring Creek and into May Pen Village	Protected Areas Management	■	■	■					■	
Link CBS management with the Northern Biological Corridor	Protected Areas Management	■	■	■		■			■	
Coordinate a civic pride campaign in schools and establish recycling, solid waste management and sustainable living campaigns	Education								■	■
Increase the number and scope of community development programmes in Belize River Valley	Eco-Cultural Tourism Development	■	■	■				■	■	■
Increase collaboration with regional conservation partners and NGOs	Protected Areas Management	■	■	■		■		■	■	■

3.4 Monitoring of Success of Conservation Strategies

Table 34. Measures of success for major cross cutting strategies.

Measures of Success	Target	What to Monitor	How to Monitor	Indicator
Re-structuring of CBS management	CBSWCG and all CBS staff	Hiring of Executive Director Number of meetings per month Adherence to management plan	Monthly and annual reports Executive Director presentations to CBSWCR Board	Hiring of Executive Director Number of meetings per month Adherence to management plan
Updating and Maintaining CBS Landowner Database and regular monitoring of landowner management plans	CBSWCG and Staff is active and functioning efficiently	Database development Level of landowner contacts	Evaluate database Number of landowner contacts Executive Director presentations to CBSWCR Board	Up and running database Frequency of landowner mapping updates Number of landowner pledges
Yearly (or every 2 years) flyover and videotaping of the CBS	CBSWCG and Staff is active and functioning efficiently	Existence of flyover	Executive Director presentations to CBSWCR Board	Flyover reports Updated landowner maps
Create an active Mussel Creek Task Force that includes local residents of Scotland Half Moon adjacent to Mussel Creek, CBS and the Forestry and Fisheries Departments	CBSWCG, Executive Director, Scotland Half Moon, Fisheries and Forestry Departments	Meetings of Task Force Meeting Minutes Adequate stakeholder involvement	Regular reports to CBSWCG Executive Director presentations to CBSWCR Board	Proposal for enforcement and protection of Mussel Creek
Explore creating Mussel Creek as an IUCN Category VI Protected Area	CBSWCG, Executive Director, Scotland Half Moon, Fisheries and Forestry Departments	Meeting of Task Force Meeting Minutes Adequate stakeholder involvement	Regular reports to CBSWCG Executive Director presentations to CBSWCR Board	Creation of a protected area Co-management agreement(s)
Explore the use of special constables in the enforcement of environmental laws and statutes	CBSWCG, Executive Director, Police, Fisheries and Forestry Departments	Hiring of constables Constable activity	Constable reports to CBS Activity Logs Executive Director presentations to CBSWCR Board	Number of enforcement actions
Flood mapping and flood preparedness	CBSWCG, Executive Director	Meetings held Summary reports	Number of meetings Executive Director presentations to CBSWCR Board	Flood map and response plan
Fire preparedness and response planning	CBSWCG, Executive Director	Meetings held Summary reports	Number of meetings Executive Director presentations to CBSWCR Board	Fire preparedness and response plan
Enhance CBS eco-cultural tourism programme and increase tourist visitation to CBS villages	CBSWCG, Executive Director, national and international tourism operators	Outreach Partnerships Stakeholder involvement	Monthly reports Executive Director presentations to CBSWCR Board	Development of a marketing strategy Development of tourism packages
Development community agreement to not clear 66 ft buffer along Belize River	CBSWCG, Executive Director, Forestry Department	Meetings Landowner discussions	Monthly reports Executive Director presentations to CBSWCR Board	Community plan for buffer protection

Table 34. Measures of success for major cross cutting strategies.

Measures of Success	Target	What to Monitor	How to Monitor	Indicator
Create and maintain an updated database on all economic activities in and around the CBS	CBSWCG, Executive Director, Belize River Valley stakeholders	Development of database Outreach activities of Executive Director	Monthly reports Executive Director presentations to CBSWCR Board	Updated and accurate database
Partner with schools to develop a regional education plan for conservation and sustainable development	CBSWCG, Executive Director, Belize Rural School and High School	Meetings with Schools School administrator and faculty input	Monthly reports Executive Director presentations to CBSWCR Board	Regional development plan for CBS and schools
CBS provides financial and logistic support for existing school programmes and infrastructure	CBSWCG, Executive Director, Belize Rural School and High School	Meetings with Schools School administrator and faculty input	Monthly reports Executive Director presentations to CBSWCR Board	Implementation of plans Sharing of resources
Re-visit the local policy of allowing free-range cattle; encourage penning of animals	CBSWCG, Executive Director, Village Councils, cattle associations	Village meetings	Monthly reports Executive Director presentations to CBSWCR Board	Free range cattle management plan
Create specific management zones in and around the CBS to manage unique aspects of different areas	CBSWCG, Executive Director, zone stakeholders	Development of plans Meetings with stakeholders	Monthly reports Executive Director presentations to CBSWCR Board	Specific zones established and approved by CBSWCG and stakeholders
Develop specific management plans for each zone	CBSWCG, Executive Director, zone stakeholders	Development of plans Meetings with stakeholders	Monthly reports Executive Director presentations to CBSWCR Board	New and specific management plans
Expand CBS towards Labouring Creek and into May Pen Village	CBSWCG, Executive Director, landowner stakeholders	Landowner education outreach Meetings with landowners	Monthly reports Executive Director presentations to CBSWCR Board	New landowner pledges and conservation plans
Link CBS management with the Northern Biological Corridor	CBSWCG, Executive Director, regional NGOs and national conservation organizations	Meeting with NGO and conservation partners	Monthly reports Executive Director presentations to CBSWCR Board	Regional corridor plan and management action guide
Increase number of community development programmes in Belize River Valley	CBSWCG, Executive Director, regional and national NGOs	Project development Project evaluation Community outreach	Monthly reports Executive Director presentations to CBSWCR Board	Number of new projects Evaluation reports of projects
Increase collaboration with regional conservation partners and NGOs	CBSWCG, Executive Director, national conservation organizations	Meeting with NGO and conservation partners	Monthly reports Executive Director presentations to CBSWCR Board	Establishment of new partnerships or working groups

4. Management Planning

4.1 Management and Organizational Background

The CBS has been challenged with a changing and complex management environment since its inception in 1985. A brief timeline summary of some of the key events, management changes and milestones is presented below.

1985	CBS established in Bermudian Landing (11 landowners)
1989	CBS expanded to include landowners in Scotland Half Moon
1986	Belize Audubon Society assumes oversight role of CBS
1986	CBS expanded to include landowners in Double Head Cabbage, Isabella Bank, Flowers Banks, Willows Bank, St. Paul's Bank and Big Falls
1987	Bridge completed over Belize River
1989	In April, the CBS Museum in Bermudian Landing was officially opened
1992-94	Some 62 howler monkeys were translocated from the CBS to the Cockscomb Basin Wildlife Sanctuary
1994	The CBS Management committee assumed all accounting and marketing responsibilities, as well as the day-to-day running of the museum and guides
1995	Belize Audubon Society ended its period of oversight over CBS operations
1995	Community Board formed
1995	Kriol Heritage Center in St. Paul's created
1995	Protected Areas Conservation Trust (PACT) formed
1996	Elston Wade CBS Committee President
1996	Elvis Lord CBS Committee President
1997	Dr. Roy Young becomes CBS Committee President
1998	Orlando Dawson CBS Committee Presidents
1998	Road paved all the way to Willows Banks
1998	The Women's Conservation Group of the CBS took control of CBS operations
1998	Some 69 CBS pledged landowners were given a $125 payment by management for belonging to the CBS
2000	Some 70 CBS pledged landowners were given $125 payment by management for belonging to the CBS
2003	CBS Education Center opens
2010	First Programme Coordinator hired
2010	Operations Manual developed for CBS
2011	Strategic Plan for CBS developed
2013	Management Plan developed and finalized

The Community Baboon Sanctuary Women's Conservation Group

The Community Baboon Sanctuary Women's Conservation Group (CBSWCG) was incorporated under the Laws of Belize in August 1998. On September 19, 2006, the organization became registered under the Revised 2000 NGO Act, Chapter 315 of the Laws of Belize.

The organizational vision statement articulated in the 2011 Strategic Plan is as follows:

> *The CBS Women's Conservation Group is a grassroots, voluntary, non-governmental organization actively contributing to the conservation of the ecological integrity of the Belize River Valley area through the effective management of the innovative and unique Community Baboon Sanctuary.*

The organizational mission statement articulated in the 2011 Strategic Plan is as follows:

> *The CBSWCG is a grassroots, non-profit, voluntary organization that conserves the natural resources of the Community Baboon Sanctuary through education, eco-cultural tourism, scientific research, and promotion of cottage industries for the socioeconomic benefit of the communities and ecological integrity of the Belize River Valley area.*

The membership of the CBSWCG is drawn from the Belize River Valley communities of Flowers Bank, Scotland Half Moon, Isabella Bank, Bermudian Landing, Double Head Cabbage, Willow's Bank, and St. Paul's/Big Falls Bank. At present, the CBSWCG has a 9 member Board of Directors.

As noted in the CBSWCG Strategic Plan (2011), the 9 member Board of Directors of CBSWCG has ultimate responsibility for governance over all aspects of the organization and the CBS. This includes responsibility for:

- Safeguarding the vision, integrity, objectives and policies of CBSWCG
- Ensuring high standards of planning, operation, administration, evaluation and reporting in CBSWCG
- Ensuring that statutory obligations are met
- Ensuring that adequate resources are available to CBSWCG for all aspects of its work and administration of the CBS
- Ensuring that resources provided to CBSWCG are used for their intended purpose and are properly accounted for

The current Board membership is as follows:

- Jessie Young (Bermudian Landing), President
- Dorla Rhaburn (Flower's Bank), Vice President
- Carolyn August (Kim) (Willow's Bank), Secretary
- Cathleen Thompson (Big Fall's/St. Paul's Bank), Treasurer
- Sarita Moody (Scotland Half Moon), Assistant Secretary
- Rosean Myvett (Double Head Cabbage), Assistant Treasurer
- Joyala Joseph (Bermudian Landing), Assistant Treasurer
- Bernice Cassasola (St. Paul's Bank), Councilor
- Loretta Bevans (Isabella Bank), Councilor

The current management and staff structure is shown in Table 35.

Table 35. Current Management and Staff Structure at the CBS

Current CBS Management and Staff (2013)	
Position	**General Duties**
CBS Women's Conservation Group (CBSWCG)	• All representatives (one from each CBS village) are responsible for attending monthly meetings • Serve as communication between CBS and respective villages • Plan and host their village's annual community meeting and report back to CBSWCG after meeting
President, CBSWCG	• Oversees the daily operations of the CBS • In charge of maintaining staff at the CBS • Approves projects administered by the CBS • Ensures that CBS village representatives are fulfilling their duties • Responsible for landowner pledges • Chief communication person between CBS and landowners • Approves loan "donations" and community requests for funding
Administrative Officer	• Open the museum each morning • Oversee employee sign in / sign out log • Answer phones • Manage staff schedules and leave requests • Administer staff payroll and benefits • Maintain the CBS website and guest relations • Oversee tour operations • Book tours and manage tour schedule • Assist guests with lodging, meals, and transportation • Assign tour guides to groups • Ensure that guests complete liability forms • Make special arrangements needed for tours • Manage the financial aspects of the CBS • Prepare daily, monthly, and annual cash reports • Manage the petty cash fund • Prepare and finalize an annual operating budget • Supervise the cleaning staff, tour guides and weekend staff
Programme Administrator	• Coordinate programmes that reflect the vision and mission of the CBS through stakeholder consultations • Prepare project proposals for funding programmes • Develop action plans and design effective work packages to facilitate effective execution of projects • Keep projects on schedule • Coordinate fundraising activities • Prepare and submit activity, progress, financial and procurement reports • Oversee day to day project implementation and management of all projects • Organize, oversee and support contractors and consultants input • Oversee implementation and timely achievement of all project deliverables • Prepare and submit project reports to CBSWCG on all projects • Engage stakeholders as necessary as possible • Prepare quarterly newsletter • Liaise with GOB and international organizations to form partnerships • Coordinate activities such as CBS anniversary, AGM, elderly Christmas parties, Farmers Market Day, summer programme, Fallet A. Young Scholarship Programme

Current CBS Management and Staff (2013)	
Tour Guides	• Greet guests and give introduction to the CBS • Accompany guests on tours • Ensure that guests are properly prepared • Have BTB tour guide certification and up-to-date on BTB policies • Must be knowledgeable on CBS history and the local flora and fauna • Confirm tour schedule with Administrative Officer
Front Desk Position	• Manage front desk • Conduct financial transactions with visitors • Prepare daily cash reports • Supervised by the Administrative Officer
Cleaning Staff	• Maintain the cleanliness of the grounds • Clean up facilities after events

Organizational Capacity

The 2011 CBSWCG Strategic Plan (2011) provides an assessment of the organizational capacity of the CBSWCG. The strengths identified in the strategic plan included:

- Core, dedicated Board members, and the camaraderie among Board members (cohesion and group strength)
- Institutional memory among long-serving CBSWCG members
- CBSWCG is well established with skilled staff members, volunteer support, a centrally located office, and facilities and equipment
- CBSWCG's success in managing programmes and projects
- CBSWCG is a leading member of APAMO
- CBS' structure is unique and innovative
- CBS website facilitates marketing
- The CBS Advisory Council and the range of expertise among its members
- Jessie Young's membership on PACT's Board

The weaknesses/challenges identified in the strategic plan included:

- Communication with the seven villages is unreliable, i.e., dispersing information due to transport and internet constraints
- The legal status of CBS within the protected area system is undefined and uncertain
- Financial constraints faced by the organization for project development and management, compounded by an over-reliance on external financial support
- CBSWCG's focus is project-driven rather than strategic
- At the same time, there is a low competency at Board level to source and access funding, promote the organization, and access support for its business and its programmes

In *The Status of Protected Areas in Belize – Report on Management* Effectiveness (Wildtracks 2009), the CBS was included in the analysis of management effectiveness. A summary of management effectiveness indicators from that report relative to the CBS are presented in Table 36. Overall, the report showed that the CBS was ranked below the mean for all other protected areas analyzed in the study in terms of resource information, resource administration and management protection.

The three indicators that exceeded the mean were participation, education and socio-economic benefit and governance. The 2009 audit of the CBS (Elite Accounting 2009) corroborated the above findings

concluding that while CBSWCG lacks the trained accounting personnel, it does have an adequate accounting system that meets the basic accounting requirements.

Table 36. A summary of management effectiveness indicators of protected areas in Belize.

Category	Score	Mean	Range of all PAs	Rank of CBS among PAs
Biodiversity Threats				
Relative Pressure Impact	47	-	6 to 52	27 of 32
Relative Threat Impact	51	-	8 to 58	24 of 32
Combined Pressure and Threat	97	-	15 to 103	25 of 32
Management Effectiveness				
Resource Information	1.8	2.30	1 to 3.8	24 of 65
Resource Administration, Management and Protection	3.1	2.73	1 to 4.0	28 of 65
Participation, Education and Socio-Economic Benefit	2.6	2.14	1 to 3.7	49 of 65
Management Planning	1.5	2.19	1 to 3.6	19 of 65
Governance	3.1	2.76	1 to 3.8	23 of 65
Human Resources	1.7	2.49	1 to 4.0	19 of 65
Mean Score Across Indicators	**2.19**	**2.51**	**1 to 3.7**	**28 of 65**

Table 36 and below definitions are based on results presented in Wildtracks (2009).

Pressure and Threat Impact: This assessment represents an attempt to rate the status of biodiversity and the impacts on it – 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.

Resource Information: 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.

Resource Administration, Management and Protection: 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.

Participation, Education and Socio-Economic Benefit: 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.

Management Planning: 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.

Governance: management effectiveness through the establishment of authority, responsibility, and accountability, with essential governance structures and supporting processes that are well designed and implemented.

Human Resources: management effectiveness in terms of human resources – the presence of sufficient, adequately educated and trained staff, with good morale to ensure high productivity.

Successful Grant Writing

Since assuming management of the CBS in 1998, the WCG has had an extraordinary record in grant writing and securing external funding. Over $900,000 Belize dollars has been secured, mainly through funding from PACT and UNDP/GEF. The 2011 Strategic Plan notes, however, that the financial constraints faced by the organization (CBS) for project development and management have been compounded by an over-reliance on external financial support. Thus new revenue streams are needed to help the CBS and the CBSWCG fully achieve this mission. Externally funded projects and grants for the CBS from 1994-2012 are summarized below.

1994 UNDP/GEF. Community Baboon Sanctuary Ecotourism Enhancement (BZE/94/02). The project's objectives are to: 1. Enhance the support of research, data gathering and the preparation of inventories by improving the facilities for such activities in the Community Baboon Sanctuary (CBS) and train its workers to facilitate such activities. 2. Increase the potential of the CBS to market, showcase and economically sustain the ecotourism activities of the sanctuary. 3. Increase the ability of all seven villages in the CBS to participate and benefit from the ecotourism potential of the CBS. BZ$22,200.

1998 St. Paul's Village receives grant monies from Programme for Belize to construct a Kriol Cultural Center in the Village.

2001 UNDP/GEF. Strengthening the Management and Conservation of the Community Baboon Sanctuary (BZE/01/09). Planning grant to develop a proposal to strengthen the management of the Community Baboon Sanctuary through capacity building and empowering its staff and members to effectively manage the Sanctuary in order to sustain and enhance the ecological and conservation successes achieved since its establishment. Planning grant to develop a proposal to strengthen the management of the Community Baboon Sanctuary through capacity building and empowering its staff and members to effectively manage the Sanctuary in order to sustain and enhance the ecological and conservation successes achieved since its establishment. BZ$2,526.

2001 UNDP/GEF. Strengthening the Management and Conservation of the Community Baboon Sanctuary (BZE/01/11). This project has played a pivotal role in ensuring effectiveness of community conservation and the protection of the flora and fauna of the CBS and also promoted the importance of women in conservation. The Women's Conservation Group is now trained in some aspect of wildlife conservation regulations and will now ensure that any development in their respective villages is in accordance with the objectives of the CBS. The group's capacity has been developed as a result of the project and unlike previous management attempts for the sanctuary; the women's group has been able to sustain their initiative of managing and protecting the sanctuary. BZ$76,850.

2002 PACT. Community Baboon Sanctuary (CBS) Educational Center. Primary objective is to create environmental awareness among the youths, students, visitors and the community members about the CBS. BZ$49.080.76.

2006 At the request of the Community Baboon Wildlife Sanctuary the AQUIF Unit provided assistance for the development of a UNDP fish farming pilot project proposal. As part of this activity fifteen farmers were visited in seven communities along the BELRIV Area; two community meetings were conducted. This resulted in five potential sites being identified. A final report was submitted to the UNDP Consultant for onward follow-up and endorsement and possible funding. The proposal has been endorsed and will be implemented during the first quarter of 2007 (Ministry of Agriculture and Fisheries Annual Report 2006).

2006 PACT. Installation of Bathroom Facilities and Annual Environmental Summer Camp. BZ $10,000.

2006 UNDP/GEF. Planning grant to develop a proposal entitled Securing the Integrity of the Community Baboon Sanctuary Through Training and Income Generating Initiatives for Stakeholders of Flowers Bank (BZE/OP3/2/06/04). The planning grant will facilitate the preparation of the proposal entitled Securing the Integrity of the Community Baboon Sanctuary Through Training and Income Generating Initiatives for Stakeholders of Flowers Bank by supporting the consultative planning process of the Flowers Bank Community Group. It will be used to provide logistical support to the group for obtaining inputs from

members and other interested stakeholders from Flowers Bank. The funds will accommodate the travel of the group members to meet with representatives from the Agriculture Department and Marketing Board to gather information. The planning grant will also provide for contracting a resource person who will help to facilitate the community stakeholders' workshops and develop the proposal. BZ$3,170.

2006 UNDP/GEF. Planning Grant to Develop a Proposal Entitled Securing the Integrity of the Community Baboon Sanctuary through Training and Income Generating Initiatives for Stakeholders of Double Head Cabbage (BZE/OP3/2/06/05). The planning grant will facilitate the preparation of the proposal entitled Securing the Integrity of the Community Baboon Sanctuary Through Training and Income Generating Initiatives for Stakeholders of Double Head Cabbage by supporting the consultative planning process of the Dauntless Designers Group. It will be used to provide logistical support to the group for obtaining inputs from members and other interested stakeholders from Double Head Cabbage. The funds will facilitate the travel of the group members to meet with representatives from the Agriculture Department to gather information. The planning grant will also provide for contracting a resource person who will help to facilitate the community stakeholders' workshops and develop the proposal. BZ$3,370.

2007 UNDP/GEF. Achieving the Goal and Objectives of the Community Baboon Sanctuary through Demonstrating Benefits from Community Involvement in Fish Farming (BZE/OP3/2/06/07). The project aims to address this threat by increasing economic activities within the CBS communities by engaging in fish farming. The primary objectives of the project are: a. Enhance participant's capacity in fish farming; b. Demonstrate the economic viability of fish farming; and c. Strengthen the community's knowledge of the importance of the CBS. BZ$96,000.

2007 Reducing local threat to biodiversity by stimulating micro-tourism enterprises (P/PROJ/96). BZ$60,000.

2007 PACT. Improving Infrastructure and Capacity Building within the Community Baboon Sanctuary (CBS) for Environmental Management. Project objectives are to: 1-improve visitor's experience to the protected area through upgrading of infrastructure; 2-create environmental awareness within the nine villages of the CBS; 3-capacity development training for staff and tour guides; and 4-establishing the CBS education center as an environmental education resource clearinghouse. BZ$40,495

2007 PACT. Poverty Reduction through Demonstration of Organic Foods for Environmentally Sound Communities. Objectives are to: 1-demonstrate the economic viability of organic chicken, pig farming and organic back yard gardening; 2-conduct capacity building for project participants and CBSWCG; and 3-improve infrastructure for CBS Education Center. BZ$60,000.

2007 UNDP/GEF. Securing the Integrity of the Community Baboon Sanctuary through Training and Income Generating Initiatives for Stakeholders in Double Head Cabbage – Dauntless Designers (BZE/OP3/2/06/10). BZ$ 70,643. This project will strengthen the capacity and willingness of residents of Double Head Cabbage to support sustainable land management in their area and to maintain their voluntary sustainable land management efforts within the Community Baboon Sanctuary. The project will contribute to improving participants' livelihoods and economic wellbeing and to maintaining the functional integrity of the terrestrial ecosystems in and around the community. Finally the project will empower community members to help mitigate the causes and negative impacts of land degradation in the area. BZ$70,643.

2008 PACT. Development of a Comprehensive Marketing Plan for the Belize River Valley Communities. BZ$10,000.

2008 PACT. Support to Belize River Valley Communities to Assist with Community Livelihood Activities Following Tropical Depression #16. BZ$$20,570.

2008 UNDP/GEF. Promotion of Sustainable Use of Biodiversity Resources in the Community Baboon Sanctuary (BZE/SGP/OP4/CORE/07/01). This project will demonstrate that the Flowers Bank Community can, on a sustainable basis, secure the integrity of the Community Baboon Sanctuary through training and income generating initiatives for stakeholders of Flowers Bank. The three main components of the project are: (i) build institutional capacity through training and development of a strategic plan (ii) enhancing a small scale cohune oil processing business, and (iii) training in agricultural best practices. BZ$98,715.

2009 PACT. Grant to CBSWCG to conduct an Audit of the CBSWCG account and Capacity Building for CBSWCG members. BZ$5,870.

2009. PACT. Fallet A. Young Environmental Summer Program. BZ$5,000.

2009 PACT. Organizational Capacity Building and Education Program. Project objectives are to: 1. design an efficient and transparent accounting system for CBS; 2. hire experienced and qualified staff that will contribute to the sustainability of the CBS; 3. design a new operational manual for the CBSWCG; 4. capacity building for managing committee members and staffs; and 5. assist the Forest Department and the CBS in enforcing the Wildlife Protection Act. BZ$39,500.

2010 UNDP/GEF. Capacity Building and Income Generation Activities to Promote Improvement in Management and Use of Environmental Resources through Training and Facilitation, to Ensure the Sustainable Livelihood for Residents in the Lower Belize River Valley Communities (BZE/SGP/OP4/Y3/CORE/10/06). A planning grant to: conduct consultations with village residents including leaders in seven villages of the lower Belize River Valley Area; gather, assimilate and analyze data; and prepare a project proposal and submit the proposal to GEF SGP for consideration. BZ$10,000.

2010 UNDP/GEF. Support for Capacity Building for Improved Protected Areas Management in Belize (BZE/SGP/OP4/Y3/CORE/10/10). The goal of this project is to increase the effectiveness of conservation NGOs and CBOs for improved management of our National Protected Areas System. Objective 1: Increase the institutional capacity of 7 conservation CBOs in four key governance and management areas. The Capacity Building Program will benefit 7 conservation CBOs: 1. Steadfast Tourism and Conservation Association; 2. Friends of Mayflower Bocawina National Park; 3. Friends of Swallow Caye Wildlife Sanctuary; 4. Forest and Marine Reserve Association of Caye Caulker; 5. Community Baboon Sanctuary Women's Group; 6. Friends of Gra Gra Lagoon Conservation Group; and 7. Rancho Dolores Environmental and Development Group. BZ$76,500.

2010 PACT. Improving Organizational Management and Sustainability. Project objective is to hire a Program Coordinator to improve the capacity in moving forward sustainability. BZ$22,800

2012 UNDP/GEF. Promoting Environmental Conservation through Community Mobilization In The Community Baboon Sanctuary (BZE/SGP/OP5/CORE/BD/11/02). The goal of the project is to enhance the sustainable development of the Community Baboon Sanctuary and the surrounding communities. Objectives: The project objectives are as follows: to promote alternative sustainable livelihoods opportunities for the community stake holders of the CBS; and to create more awareness regarding the importance of environmental conservation in the communities. The project intends to achieve the following results: 1- Enhanced capacity of CBSWCG Board and Staff to manage protected areas and projects; 2- Strengthened partnerships with other agencies involved in environmental conservation, agricultural and economic development; 3- Increased socialization on the importance of environmental conservation among CBS community members; 4- Increased number of community members participating in alternative livelihoods activities which contributes to sustainable land management practices; 5- Reduction in the economic vulnerability of the population in the area; and 6- Increased community membership and participation in CBS activities. BZ$100,000.

2012 PACT. Small grant to the Community Baboon Sanctuary Women's Conservation Group (CBSWCG) for the preparation of a management plan for the Community Baboon Sanctuary. The Community Baboon Sanctuary is a voluntary grassroots conservation initiative established in the Belize River Valley, with the goal of sustaining the habitat of the Black Howler Monkey while promoting economic development in the participating communities. BZ$60,000.

4.2 Review of Previous Management Programmes

The current management iteration has been the longest in the CBS's history, dating back the Women's Conservation Group taking the reins of management in 1998. The current discussion is based on a review of management programmes initiated under this leadership body. The basic assessment scale used for the evaluation is shown in Table 37.

Table 37. Basic assessment for evaluation previous management programmes.

Rating	Scale	Description
Succeeded	**5**	The objective was met successfully
Improved	**4**	The objective was not completely met, but the situation was improved
No Change	**3**	The objective was not met, and there was no change in status
Worse	**2**	The objective was not met and the status has deteriorated somewhat
Failed	**1**	The objective has not been met, and the status has deteriorated completely

Management programmes have focused on the five key areas highlighted in the CBS mission, namely conservation, ecotourism, education, research and community development. The assessment of management programmes is thus centered on these five themes. Table 38 summarizes the results for the CBS in that assessment.

Table 38. An evaluation summary of measures of success for previous management objectives at the CBS from 1998 to 2012.

Measures of Success Matrix for Previous Management Objectives						
Programmes/Projects	*Measure of Success of Implementation*					
	Successful	*Somewhat Successful*	*No Change*	*Somewhat Worse*	*Failed*	Comments
Conservation						
Pledge Programme Leave strips of forest when clearing Maintain a viable population of BH Landowner adherence to plans	x		x x			Landowners have not been re-visited regularly after signing pledges and there is currently no landowner database or information on property ownership.
Education						
Summer Programme Improving academic knowledge Increase environmental awareness		x x				The Programme has been successful though it is not being offered in 2012. It is listed as somewhat successful because there are no formal evaluations of the Programme.
Tourist Education Programme Enhance visitor awareness		x				It is listed as somewhat successful because there are no formal evaluations of the
Eco- Cultural Tourism						
Ecotourism Marketing outreach			x			There have been great fluctuations in tourist visits to the CBS with the peak in 2005.
Research						
Science research recruitment			x			Basic scientific research continues to occur, though some sporadically in recent years
Community Development						
Acquiring Grants Sustainable Agriculture Organic farming Tilapia fish farming Organic livestock Dauntless designers	x	x x x x x				The CBSWCG has had an extraordinary track record in acquiring outside funding. Between 1998 and 2012 they have received some BZ$961,090 in grants for PACT, UNDP/GEF and other sources. This is a remarkable achievement.

4.3 Management Goals

The CBS Strategic Plan (2011) provides the context for setting management goals for the CBS and the role of the CBSWCG in helping meet those goals. Figure 21 is an excerpt from the 2011 CBS Strategic Plan and is a summary of the Key Results Areas and Strategies for the CBS. The Strategic Plan notes that the CBSWCG intends to accomplish its mission by focusing on the following Key Result Areas: Institutional Strengthening; (2) Education; (3) Public Awareness; (4) Eco-Cultural Tourism Development; (5) Protected Areas Management, and (6) Strategic Alliances.

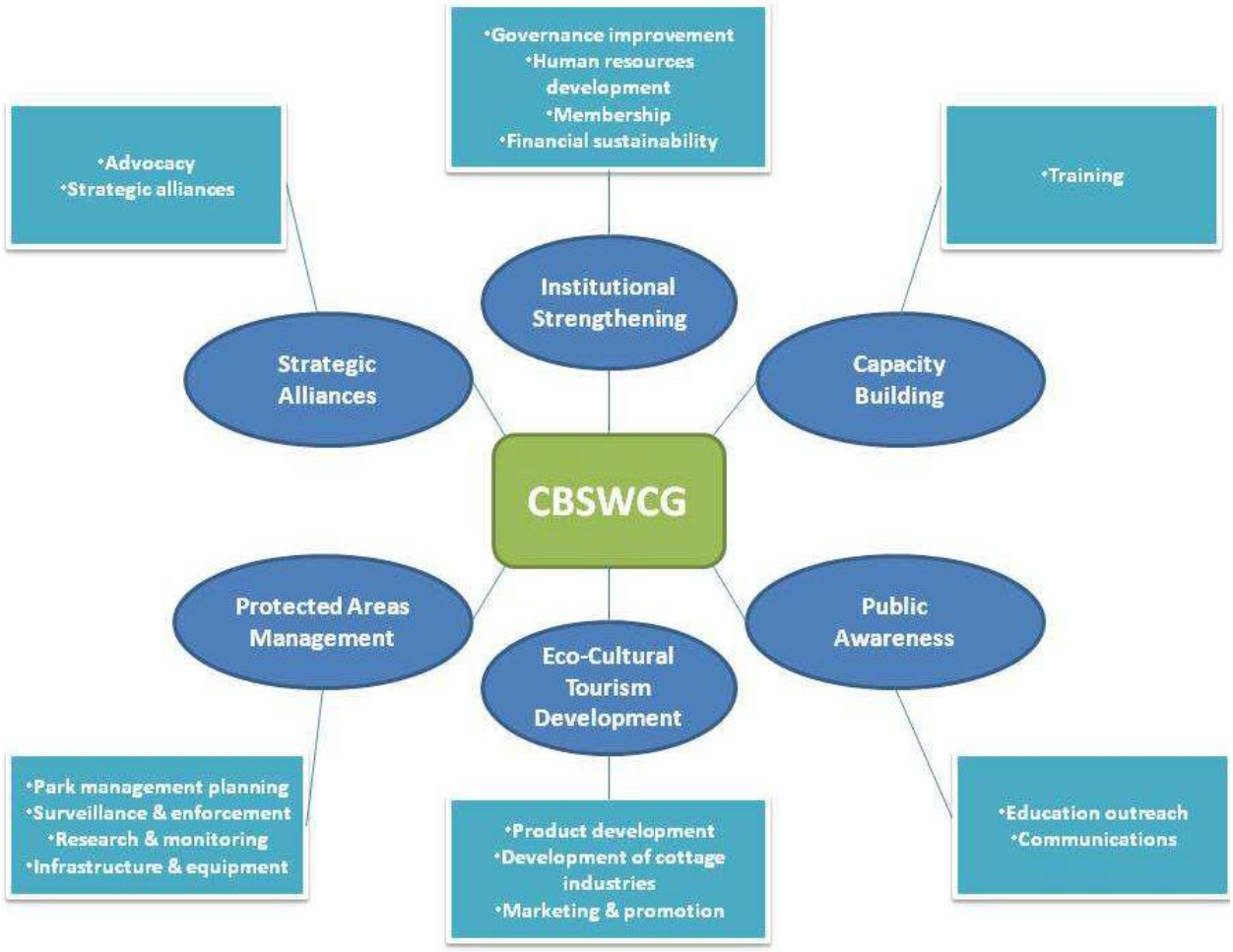


Figure 21. A summary of the Key Results Areas and Strategies for the CBS as outlined in the 2011 Strategic Plan.

Based on the review of the recent history and current conditions at the CBS, the guidance of the 2011 Strategic Plan and consultations with the CBSWCG, specific management goals have been proposed that are the basis of this management plan. These management goals are presented in Table 39.
The current management goals have been aligned with the Key Results Area and strategies outlined in the Strategic Plan. In some cases, new management goals have been added that were not in the Strategic Plan.

Table 39. Management goals for the CBS: 2013 – 2018.

Management Goals	Timeline	Links with 2011 Strategic Plan Key Result Area and Strategies*		Measures/Assessment
Administration and Governance				
		KRA	**Strategy**	
Review Articles of Association of CBSWCG	2013	1	Governance Improvement	Yearly Board reports
Re-activate CBS Advisory Council	2013-2014	1	Governance Improvement	Meeting of Advisory Council
Improve communications: web site, newsletter	2013-2018	3	Public Awareness	Updated web site; issuing newsletters
Create an Executive Director position	2013	1	Human Resources Development	Hiring of new Director
Institute a Staff Appraisal Programme	2013-2014	1	Human Resources Development	Creation of Plan
Align Operations Manual with Management Plan	2013	1	Membership	Update and Approval of Plan
Develop an external CBS membership programme	2013-2014	1	Human Resources Development	Functional programme with paying members
Institute a fundraising programme	2013-2015	1	Financial Sustainability	Development and deployment of plan
Develop annual operations plans	2013-2018	5	Park Management Planning	Development of plans
Upgrade office facilities	2013	5	Infrastructure and Procurement	New office space operational
Conservation				
A viable population of black howler monkeys	2013-2018			Regular census of howlers (every 2 to 3 years)
Develop a landowner and membership database	2013	3	Public Awareness	Access to functional and up-to-date databases
Re-Pledge CBS landowners	2012-2013	6	Advocacy	Number of landowners re-pledged
Advocate for enforcement of the '66 ft reserve'	2013-2018	5 6	Park Management Planning Advocacy	Regulations to protect 66 ft buffer reserve
Divide the CBS into management zones to increase the scope and depth of management	2013-2014			Formal adoption of management zones by WCG and landholders
Develop management plan for each zone	2013-2018			Completed management plans for each zone
Expanding voluntary management plan system to all management zones	2013-2018			Number of new pledges per management zone
Promote ecological/forest restoration	2013-2018			Number of trees planted / CBS nursery output
Recruit and train Special Constables; Develop patrolling programme	2013-2014	5	Surveillance and Enforcement	Number of Constables trained Established patrolling programme
Monitor forest clearing/land use in CBS	2013			Flyovers every 2 years
Expand Sanctuary	2013-2014			New landowner pledges in May Pen and up-river from St. Paul's towards Labouring Creek
Increase linkages with protected areas and biological corridors in north-central Belize	2013-2018	6	Strategic Alliances	Creation of a corridor Working Group Regular meetings with stakeholders

Table 39. Management goals for the CBS: 2013 – 2018.

Management Goals	Timeline	Links with 2011 Strategic Plan Key Result Area and Strategies*		Measures/Assessment
Eco- Cultural Tourism				
		KRA	**Strategy**	
Increase the number of tourists and tourist revenues	2013-2018			Tourist traffic increase Increased tourist revenues
Develop and implement marketing programme	2012-2013	4	Marketing and Promotion	Marketing plan completed
Have CBS Staff attend trade shows	2013-2018	4	Marketing and Promotion	Attendance at shows
Develop relationships with tour operators	2013-2018	6	Strategic Alliances	Functional tourism relationships
Develop a unified entrance/user fee structure	2012-2013	1	Financial Sustainability	Fee structure put in place in operations
Establish a Kriol Culture Center in the CBS	2013-2018	4	Product Development	Unveiling of new facility in one of the CBS villages or re-vamping of St. Paul's facility
Develop Tourist Packages focused on nature, culture and education	2012-2013	4	Product Development	Total number of tourist visits to CBS Number of package tours run
Develop new website and social media capacity for tourism marketing	2012-2013	3	Public Awareness	Website/social media traffic assessment
Improve museum infrastructure	2012-2013	5	Infrastructure and Procurement	Regular review of exhibits and building
Expand CBS Gift Shop	2012-2013	1	Financial Sustainability	Completed renovations
Provide additional tour guide and staff training	2013-2014	2	Training	Number and type of training events
Improve trail infrastructure	2012-2013	4	Eco-Cultural Tourism Development	New trails throughout CBS
Organize annual CBS anniversary celebration and environmental fair	2013-2018	4 1	Marketing and Promotion Membership	Holding of annual events
Community Development				
Assist landowners in identifying economic and other opportunities	2012-2015	3	Membership	Increase in number of projects Number of new grants received
Coordinate training for cottage industries	2013-2018	2	Training	Number and content of training sessions
Develop micro-financing opportunities for CBS landowners	2013-2018	1 4	Financial Sustainability Development of Cottage Industries	Number of micro-grants issued and assessed
Enhance and expand home-stay programme	2013-2018	4	Development of Cottage Industries	Number of home-stay venues and their status
Promote the production of local crafts	2013-2018	4	Development of Cottage Industries	Successful production and sales
Assist Dauntless Designers and Flowers Bank CBO	2013-2018	4	Development of Cottage Industries	Successful production and sales

Table 39. Management goals for the CBS: 2013 – 2018.

Management Goals	Timeline	Links with 2011 Strategic Plan Key Result Area and Strategies*		Measures/Assessment
Education				
		KRA	**Strategy**	
Landholder education and feedback	2013-2018	3	Public Awareness	Landowner meetings Updated landowner pledges and plans
Develop an environmental curriculum for local schools	2013-2018	3	Education Outreach	Curriculum package Deployment in schools
Organize and conduct school presentations/trips	2013-2018	3 4	Education Outreach Marketing and Promotion	Number of presentations / field trips
Coordinate a civic pride campaign in schools and establish recycling and solid waste management	2013-2015	3 6	Education Outreach Advocacy	Successful establishment of recycling and solid waste management programmes
Establish CBS Education Center as a learning/study area	2013-2014	3	Education Outreach	Education Center refurbished
Partner with Belize River Valley Schools	2013-2018	6	Strategic Alliances	Number of new programmes
Research				
Develop a database system for research and monitoring data	2013-2018	5	Research and Monitoring	
Encourage howler research and howler censusing	2013-2018	5	Research and Monitoring	Number of researchers engaged in projects Successful censusing counts
Develop clear guidelines and standard fee for researchers	2013	5	Research and Monitoring	Fee programme established and functioning
Establish and equip a Research Center	2013-2018	5	Research and Monitoring	Stocked research center

***** The Key Results Area (KRA) codes refer to the following:

1 – Institutional Strengthening
2 – Capacity Building
3 – Public Awareness
4 – Eco-Cultural Tourism Development
5 – Protected Areas Management
6 – Strategic Alliances

Strategies are those outlined under each Key Results Area

4.4 Management Strategies

All the proposed management strategies are linked to the assessments and goals outlined earlier in the Management Plan and aligned with the Key Result Areas in the 2001 Strategic Plan, namely: (1) Institutional Strengthening; (2) Education; (3) Public Awareness; (4) Eco-Cultural Tourism Development; (5) Protected Areas Management; and (6) Strategic Alliances.

4.4.0.5 Re-Structuring of CBS Management

CBS Management reorganization is an important, overarching mechanism to better align the management of the CBS with the organizational mission and to improve accountability, transparency, efficiency and communication. The reorganization will also help clarify and improve governance and provide more opportunities for development and capacity building for the CBSWCG and CBS staff. This reorganization is being done to facilitate the institutional strengthening mandate in the Strategic Plan. Under that document, it states that this core objective will be achieved by implementing four major strategies: (1) Governance improvement, (2) Human resources development, (3) Membership, and (4) Financial sustainability. These strategies are embedded in the management re-structuring plan presented here, especially strategies (1) and (2).

One of the key components of this re-structuring is the formation of the new Executive Director position. The position will essentially be a conflation of the current Administrative Officer and Programme Coordinator positions. Given this change, the role of the CBSWCG will also change as will the role of the President of the CBSWCG. The proposed changes also call for enhancing the current Front Desk Position and re-structure it to be called an Administrative Assistant. The basic duties that will be shifted in this position re-alignment are summarized in Table 40.

Table 40. Summary of the re-structuring of CBS Management.
Both the current positions and the restructured positions are shown.

Current CBS Management and Staff (2012)		**Re-Structured CBS Management**
CBSWCG		
Position	**General Duties**	**Re-Structured General Duties**
CBS Women's Conservation Group (CBSWCG)	• All representatives (one from each CBS village) are responsible for attending monthly meetings • Serve as communication between CBS and respective villages • Plan and host their village's annual community meeting and report back to CBSWCG after meeting	• All existing duties remain the same Additional development will b: • To develop criteria for CBSWCG membership • Oversee Executive Director • Approves projects administered by the CBS
President, CBSWCG	• ~~Oversees the daily operations of the CBS~~ • ~~In charge of maintaining staff at the CBS~~ • ~~Approves projects administered by the CBS~~ • Ensures that CBS village representatives are fulfilling their duties • ~~Responsible for landowner pledges~~ • ~~Chief communication person between CBS and landowners~~ • Approves loan "donations" and community requests for funding	• Ensures that CBS village representatives are fulfilling their duties • Chief communication person between Executive Director and CBSWCG • Approves donations and community requests for funding (need criteria)

Current CBS Management and Staff (2012)		Re-Structured CBS Management
NEW EXECUTIVE DIRECTOR POSITION		
Old Positions	General Duties	**New Executive Director Position**
~~Administrative Officer~~	~~• Open the museum each morning~~ • Oversee employee sign in / sign out log ~~• Answer phones~~ • Manage staff schedules and leave requests • Administer staff payroll and benefits ~~• Maintain the CBS website and guest relations~~ ~~• Oversee tour operations~~ ~~• Book tours and manage tour schedule~~ ~~• Assist guests with lodging, meals, and transportation~~ ~~• Assign tour guides to groups~~ ~~• Ensure that guests complete liability forms~~ ~~• Make special arrangements needed for tours~~ • Manage the financial aspects of the CBS • Prepare daily, monthly, and annual cash reports (QuickBooks) • Manage the petty cash fund • Prepare and finalize an annual operating budget • Supervise the cleaning staff, tour guides and weekend staff	CBS Administration • Oversees daily operation of the CBS • Oversee employee sign in / sign out log • Manage staff schedules and leave requests • Administer staff payroll and benefits • Authorizes commission payment • Manage the financial aspects of the CBS • Review and authorize weekly, monthly and annual budget • Oversight of petty cash fund • Prepare and finalize an annual operating budget • Supervise the Administrative Assistant, tour guides, weekend staff, cleaning staff • Prepare quarterly newsletter Programmes (five focal areas) • Chief communication person between CBS and landowners • Responsible for landowner pledges • Develop and coordinate programmes that reflect the vision and mission of the CBS through stakeholder consultations • Prepare project proposals for funding programmes • Develop action plans and design effective work packages to facilitate effective execution of projects • Fulfill grant reporting requirements • Organize, oversee and support contractors and consultants • Prepare and implement a marketing strategy for the CBS eco-cultural tourism programme (develop relationships with tour operators, market on cruise ship, develop tour packages) • Coordinate programmes such as CBS anniversary, AGM, elderly Christmas parties, Farmers Market Day, summer programme, Fallet A. Young Scholarship Programme Other Duties • Coordinate fundraising activities • Liaise with GOB and international organizations to form partnerships • Engage stakeholders as necessary as possible • Weekly visits to area villages
~~Programme Administrator~~	• Coordinate programmes that reflect the vision and mission of the CBS through stakeholder consultations • Prepare project proposals for funding programmes • Develop action plans and design effective work packages to facilitate effective execution of projects • Keep projects on schedule • Coordinate fundraising activities • Prepare and submit activity, progress, financial and procurement reports • Oversee day to day project implementation and management of all projects • Organize, oversee and support contractors and consultants input • Oversee implementation and timely achievement of all project deliverables • Prepare and submit project reports to CBSWCG on all projects • Engage stakeholders as necessary as possible • Prepare quarterly newsletter • Liaise with GOB and international organizations to form partnerships • Coordinate activities such as CBS anniversary, AGM, elderly Christmas parties, Farmers Market Day, summer programme, Fallet A. Young Scholarship Programme	

Current CBS Management and Staff (2012)		Re-Structured CBS Management
Tour Guides	• Greet guests and give introduction to the CBS • Accompany guests on tours • Ensure that guests are properly prepared • Have BTB tour guide certification and up-to-date on BTB policies • Must be knowledgeable on CBS history and the local flora and fauna • Confirm tour schedule with Administrative Assistant	• Greet guests and give introduction to the CBS • Accompany guests on tours • Ensure that guests are properly prepared • Have BTB tour guide certification and up-to-date on BTB policies • Must be knowledgeable on CBS history and the local flora and fauna • Confirm tour schedule with Administrative Assistant
	Front Desk Position	**New Administrative Assistant**
~~Front Desk Position~~	• Manage front desk • Conduct financial transactions with visitors • Prepare daily cash reports • Supervised by the Executive Director	• Open the museum each morning • Answer phones • Manage front desk • Conduct financial transactions with visitors • Prepare daily cash reports\ Maintain the CBS website and guest relations • Oversee tour operations • Book tours and manage tour schedule • Assist guests with lodging, meals, and transportation • Assign tour guides to groups • Ensure that guests complete liability forms • Make special arrangements needed for tours • Supervised by the Executive Director
Cleaning Staff	• Maintain the cleanliness of the buildings and grounds • Clean up facilities after events	• Maintain the cleanliness of the buildings and grounds • Clean up facilities after events

Re-Constituting the CBSWCG Advisory Council – The Council, although part of the current management structure of the CBS, is not currently active. It needs to be 're-activated' and become part of the institutional strengthening of the CBS. The Advisory Council needs to have clear Terms of Reference (TOR).

Thus, overall this reorganization would require the following actions prior to its implementation:

- Writing new job and position descriptions for the Executive Director, CBSWCG Group President and Administrative Assistant Positions
- Revision of the Terms of Association of the CBSWCG
- A clear description of TOR for the Advisory Council
- A clear mechanism and dedicated revenue source to sustainably fund the new Executive Director position

4.4.1 Management Zones

Zoning is an important management tool for protected areas and this is also true of the CBS. Zoning in the CBS has more to do with expansion of the geographic zone of influence of the CBS rather than parsing apart the existing boundaries of the CBS. Indeed, the CBS lands represent one of the management zones. Management zones can be extremely useful so long as their delineation is done for good management reasons and that the zones reflect the conservation mission of the managing body. The IUCN (1994) notes:

> *Though the primary purposes of management will determine the category to which the area is assigned, management plans will often contain **management zones** for a variety of purposes which take account of local conditions. However, in order to establish the appropriate category, at least three-quarters and preferably more of the area must be managed for the primary purpose; and the management of the remaining area must not be in conflict with that primary purpose*.

Given these realities and concerns, six management zones are proposed for the CBS each with its own specific management objectives. The CBS itself remains the core management zone and around which all other management activities revolve. The six management zones are:

Zone A - The Community Baboon Sanctuary (15.6 mi^2)
Zone B – Housing and Sustainable Development (5.1 mi^2)
Zone C – CBS Expansion into May Pen Village (4.2 mi^2)
Zone D – CBS Expansion to Labouring Creek (1.1 mi^2)
Zone E - Pine Ridge and Savanna Biological Corridor (90.8 mi^2)
Zone F – Mussel Creek Drainage (3.2 mi^2)

The proposed six management zones are presented in Table 41. These zones are also mapped and the extent of each zone is shown in Figure 22. A similar zone-based management scheme was proposed for the region in a 2000 Programme for Belize Report (see Figure 23).

Zone Management Plans

If the six zones are adopted, specific management plan annexes will have to be developed for each of them. Of course the CBS management plan is completed, and two of the six zones are extensions of the existing CBS. Thus, only four (4) new management plan annexes will have to be developed and these will be based on the principles of the CBS pledge system and management will still be based on the CBS mission outlined in the 2011 Strategic Plan. The extension of CBS management to encompass these new zones needs to be slow and deliberate and must be aligned with institutional strengthening and capacity building efforts.

In addition, the regional zone management plan will require CBS personnel to work closely and in partnership with regional and national stakeholders. The final role of CBS in the management of these zones will need to be determined after consultation, discussion and the reaching of formal agreements for management and/or co-management.

Table 41. A Summary of CBS Regional Management Zones and Objectives.

Management Zone		Area mi^2	Objective
Zone A	**The Community Baboon Sanctuary**	**15.6**	This is the most significant zone for protection of the black howler monkey and its habitat. The individual landholding is the basic management unit and is the basis of the pledge system and conservation planning and management.
Zone B	**Housing and Sustainable Development**	**5.1**	This zone corresponds to the major roads that cut across the Belize River Valley from Scotland Half Moon, up to Flowers Bank, the road to St. Paul's Bank, and the road's extending to Rancho Dolores and Lemonal. This zone has become the primary zone for housing, schools, recreation, shops and churches, especially as in the past two decades, many people have migrated from the river banks to the 'pine ridge' areas. In addition, most new house are being constructed along or near these roads. As such, management of this zone is focused on controlling and limiting the environmental impact of this development while simultaneously promoting sustainable development initiatives. In terms of howler habitat, many of these areas are peripheral to the riparian forests and provide low quality or no habitat.
Zone C	**CBS Expansion into May Pen Village**	**4.2**	The zone encompasses the riparian corridor downstream from the existing Sanctuary includes the village of May Pen. This is a small village that can be included in the CBS and extend the Sanctuary from Flowers Bank nearly to the Northern Highway. This area will also eventually include the road being constructed from the Northern Highway to Isabella Bank. This would be a proactive measure to establish the conservation principles of the CBS prior to housing and land use development that is inevitable along the new road.
Zone D	**CBS Expansion to Labouring Creek**	**1.1**	This zone includes the lands upstream from Big Falls/St. Paul's that extend up to the Labouring Creek Jaguar Corridor and the Spanish Creek Wildlife Sanctuary. This is an important area of land that is linked to the northern wildlife corridor and closes a 'gap' in the corridor management matrix. This inclusion is also important in light of recent development impacts within the Labouring Creek Jaguar Corridor.
Zone E	**Pine Ridge and Savanna Biological Corridor**	**90.8**	This Zone is the largest by far and connects the CBS with the Crooked Tree Wildlife Sanctuary to the North and the Rio Bravo Management Area to the west. This management zone will be created to help maintain the ecological functionality of a wildlife corridor while encompassing community development projects. Management of this zone will require strategic partnerships with surrounding protected areas and other stakeholders.
Zone F	**Mussel Creek Drainage**	**3.2**	This zone includes the areas along the Mussel Creek drainage, including Mussel Creek, Cox Lagoon and Muckleheny Lagoon. It is proposed that this be established as an **IUCN Category VI Protected Area**. This is a protected area with sustainable use of natural resources that will conserve ecosystems and habitats, together with associated traditional natural resource management systems. Most of the area will remain in a natural condition but a proportion will be under sustainable natural resource management and where low-level, local fishing will be allowed. This will likely require a co-management agreement.

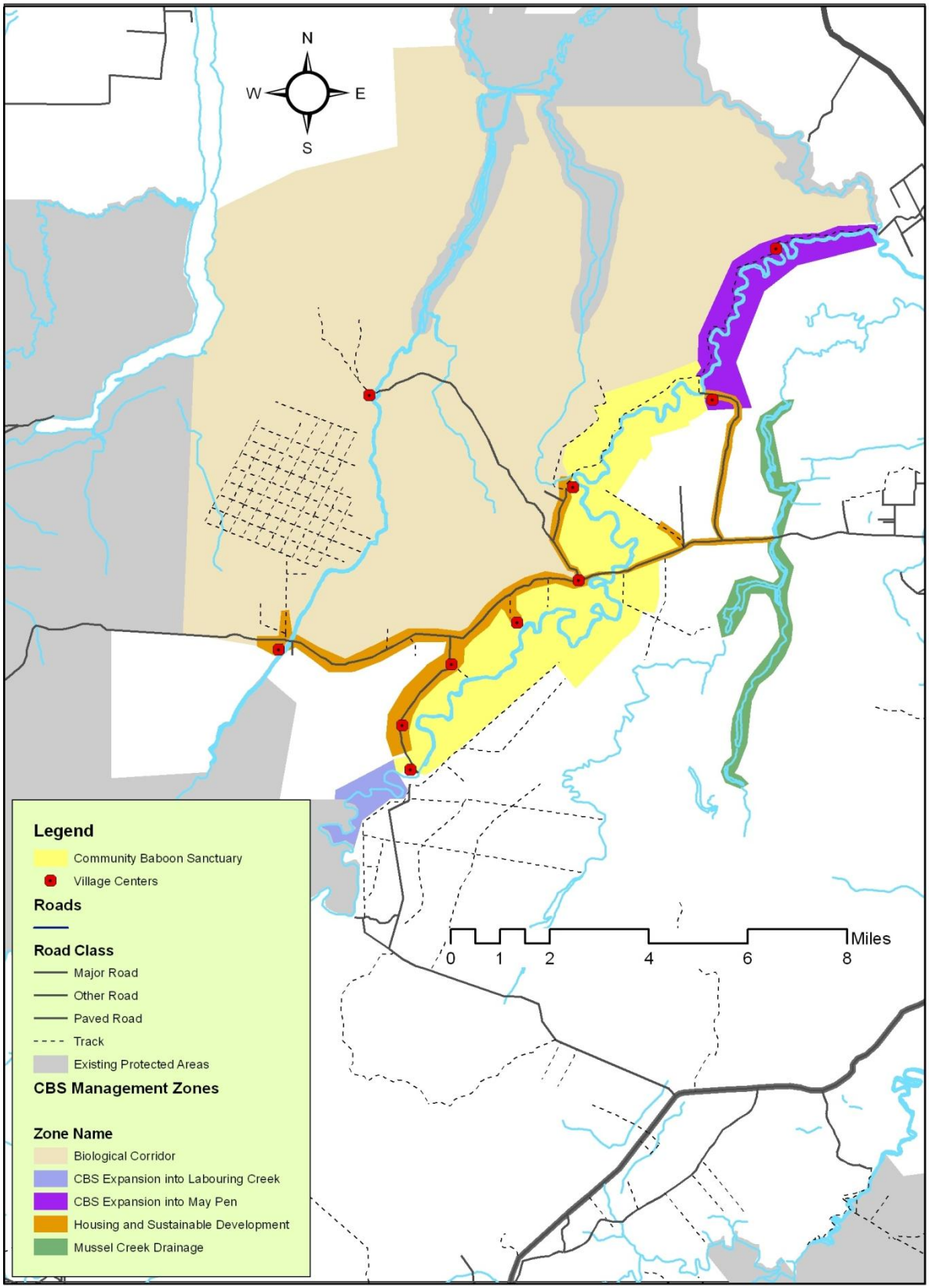


Figure 22. Proposed management zones for the lower Belize River Valley region.

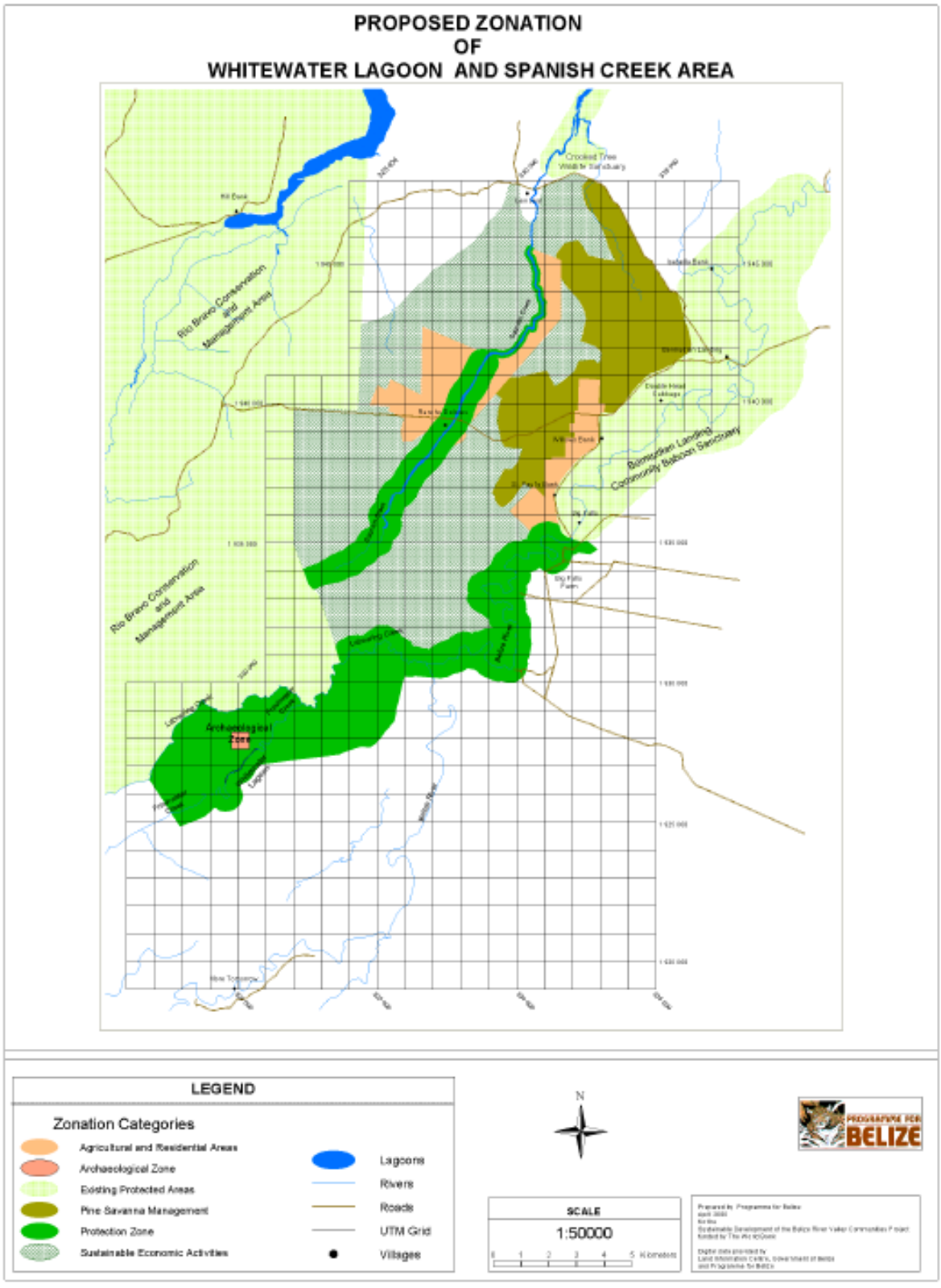


Figure 23. Proposed zonation of the Whitewater Lagoon and Spanish Creek Areas presented by the Programme for Belize in a proposed management plan for the area in 2000.

4.4.2 Limits of Acceptable Change (LAC)

Given that only the CBS management zone plan currently exists, this discussion is limited to the land the make up the CBS and their associated management. Given that it is not just visitor impacts that impact CBS lands but also landowner impacts, the analysis has been broken down into those two categories. This analysis assumes that once acceptable limits are exceeded, reviews need to take place and specific management actions will need to be taken to address the threat(s).

Tourist Impacts – It is necessary to establish goals for tourism in any protected area, but especially a Community Conserved Area like the CBS as tourism is embedded within the community. All subsequent planning and actions need to follow from these established goals. Planning and actions include modifying/building infrastructure, developing tourist packages and setting goals on levels of weekly, monthly and yearly tourist visitations. Overall, tourism can change biophysical conditions, challenge social acceptability and require specific managerial responses when limits are exceeded.

Landowner Impacts – Given that the individual landholding is the basic management unit in the CBS, the nature, level and extent of landowner land use can have major impacts on meeting established conservation and community development goals. Thus, clear limits need to be established and be effectively communicated with all landholders so they are aware of the limits and work to not exceed them within the voluntary management framework established in the CBS.

In developing limits of acceptable change for CBS landholders within the CBS, the so-called 'Malawi Principles' for the ecosystem approach (CBD 1998) can inform the complexity of applying acceptable limits in a voluntary, working landscape with no core protected areas. The 12 principles are:

1. Management objectives are a matter of societal choice.
2. Management should be decentralized to the lowest appropriate level.
3. Ecosystem managers should consider the effects of their activities on adjacent and other ecosystems.
4. Recognizing potential gains from management there is a need to understand the ecosystem in an economic context, considering e.g., mitigating market distortions, aligning incentives to promote sustainable use, and internalizing costs and benefits.
5. A key feature of the ecosystem approach includes conservation of ecosystem structure and functioning.
6. Ecosystems must be managed within the limits to their functioning.
7. The ecosystem approach should be undertaken at the appropriate scale.
8. Recognizing the varying temporal scales and lag effects which characterize ecosystem processes, objectives for ecosystem management should be set for the long term.
9. Management must recognize that change is inevitable.
10. The ecosystem approach should seek the appropriate balance between conservation and use of biodiversity.
11. The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
12. The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

The summary of the limits of acceptable change relating to CBS management are shown in Table 42.

Table 42. A summary of the limits of acceptable change within the CBS.

Community Baboon Sanctuary			
Management Problems and Concerns	**Acceptable Limits**	**Ecosystems/Land Area Impacted**	**Management Action if Limit Exceeded**
TOURIST IMPACTS			
Biophysical Impacts			
Poor solid waste management	No improper disposal of trash in Villages, on roads or on trails	All areas can be impacted but specially public areas	Enforce the no trash policy (Betta no litta) Increase number of trash receptacles Guides discuss problem with tour operators
Heavy traffic on trail systems	Trails must not be eroded No collection of plants or other materials is allowed	Mainly forested areas that trail systems traverse	Trail maintenance; avoiding steep slopes Building of bridges over water flows Limit size of tour groups
Impacts on howler monkeys	No feeding of monkeys No harassment of monkeys	Mainly forested areas that trail systems traverse	Guides intercede when observing these behaviors Guides discuss problem with tour operators
Social Acceptability			
Disrespectful tourists, meaning inappropriately dressed, foul language, rude behavior	All tourists should practice decorum at all CBS venues	NA	Provide clear guidance upon arrival at CBS Guides intercede when observing these behaviors Guides discuss problem with tour operators
Tourists wandering on private property	All tourists need to be kept on established trails and acceptable public areas	NA	Provide clear guidance upon arrival at CBS Guides intercede when observing these behaviors Guides discuss problem with tour operators
Home stay complaints	Tourists should always treat hosts with respect	NA	Provide clear guidance upon arrival at CBS CBS staff intercede when issues arise
Tourist disruption of daily life in village (schools, churches, etc)	Tourists must not interfere with ongoing village activities	NA	Provide clear guidance upon arrival at CBS CBS staff intercede when issues arise
Dispersion of tourists throughout CBS	Tourists should be encouraged to travel to other villages	NA	Distinct tourist packages to other tourists Development of tourist infrastructure outside Landing Provide tourists options upon arrival at CBS

Table 42. A summary of the limits of acceptable change within the CBS.

Management Problems and Concerns	Acceptable Limits	Ecosystems/Land Area Impacted	Management Action if Limit Exceeded
LANDOWNER IMPACTS			
Biophysical Impacts			
Excessive clearing of land	Limits are based on individual management and conservation plans	All forest types in CBS Especially problematic if in 66 ft wide	CBS staff contact landowner to discuss management plan Regular landowner contacts Wide distribution of periodic CBS newsletters
Clearing of 66 ft riverside buffer	This is not permitted under Belizean Law	All forest types in the CBS but particularly the riparian forest corridor	CBS staff contact landowner to discuss management plan Regular landowner contacts Wide distribution of periodic CBS newsletters
Free-range cattle damaging trail systems and museum grounds	Cattle should ideally be excluded from the CBS grounds and CBS trails	Forests along trails Museum and surrounding area	Fence maintenance at CBS museum site CBS staff discuss problems with cattle owners Having alternative trail options when damage occurs
Social Acceptability			
Blocking tourists from access to private property	The CBS has no authority to supersede private landowner wishes	NA	CBS staff discuss options with landowner Consider payment to landowner for property access Maintain alternative trail options
Landowner complaints about tourists on private lands	Tourists should stay on trail systems and in acceptable public areas	NA	CBS staff discuss intrusions with landowners Provide clear guidance upon arrival at CBS CBS staff intercede immediately when issues arise

NA = Not Applicable

4.4.3 Management Constraints and Limitations

This Management Plan has been developed based on the premise the CBSWCG working with CBS staff and the CBS Advisory Council, can build its capacity to expand its role as overseer of implementation of this management plan. The CBSWCG is comprised of a group of hard working, dedicated members that have worked voluntarily and often under hardship, to maintain the CBS and solidify and expand its role in conservation and community development efforts in the Belize River Valley.

To fully achieve its mission, the CBSWCG will needs to have a close working relationship with CBS staff and the CBS Advisory Council and acquire additional training and expertise when needed. Equally important, during the implementation of the Management Plan the CBSWCG will need to simultaneously provide their time-tested guidance in steering the CBS and ensuring it is and remains a truly community-based enterprise reflecting the culture, values and perspectives of the Kriol villages in the Belize River Valley.

The capacity of the CBS organization was discussed previously (**Section 4.1** Management and Organizational Background) and during the 2011 Strategic Planning process, a performance audit exercise was undertaken by the CBSWCG via a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. This information was used to create Table 43.

In also should be noted that the CBS is at its core, a voluntary effort and as such, its management is dependent on the participation and will of each individual landholder and/or household. The basic conservation management unit remains the individual landholding whether it is a freehold or lease. Thus stakeholder/landowner buy in and inclusion is essential in every facet of the CBS operation and community and stakeholder input is essential to the long-term viability of the CBS.

Table 43. An analysis of the constraints and limitations and risks associated with key management strategies outlined in the Management Plan.

Management Strategy	Constraints and Limitations	Risks
Restructuring CBS Management	• Ability to hire an Executive Director • Cannot move too rapidly • Need to ensure public awareness of changes	• Securing long-term funding/revenues for Executive Director position • Loss of control of CBSWCG
CBSWCG Board Capacity Building	• The CBSWCG is a strictly Volunteer Board • Logistical constraints for meeting and training	• Inadequate training for Board • Board 'burn out'
Landowner Outreach	• Time required for outreach • Lack of up-to-date information on land ownership and use	• CBS landowners ignore pledges • Reductions in CBS membership • Lack of knowledge transfer to next generation
Management Zone Formation	• Requires expansion of CBS management sphere • Time to form new partnerships • Limited time to dedicate to all zones	• Spreading CBS management too thin • Expanding too rapidly • Physical expansion outpaces capacity building
Eco-Cultural Tourism Expansion	• Limited marketing budget and expertise • Competitive tourism market • Delivering tour packages consistently	• Stagnant tourism levels limit revenues • Inability to increase market share • Loss of control of tourism experience
Increased Community Development	• Minimal logistical support for projects • Inadequate project evaluation structures • Limited transportation across CBS	• Inadequate project evaluation and follow-up limits sustainability of projects • Lack of markets for products
Infrastructure Improvements	• Material and labor costs • Land access for new trail systems	• Inadequate tourism facilities • Inability to offer tour packages
Public Awareness	• Outreach and materials costs • Expertise in outreach campaigns • Time requirements needed to work with landowners	• Loss of public confidence
Education	• Logistical difficulties in traveling to schools • Need for teacher/administration buy in	• Insufficient educational programming
Financial Management	• Lack of consistent financial record keeping	• Poor accounting impacts reputation of CBS

4.5 Management Programmes, Objectives and Management Actions

4.5.1 Natural Resource Management Programme

Overall Objective: Maintain a viable black howler monkey population by protecting habitat for howlers and other wildlife species and conserve the natural resources of the Community Baboon Sanctuary

The objective of the Natural Resource Management Programme is to effectively manage the CBS in order to protect the habitat of the black howler monkey, the conservation of other wildlife and the sustainable use of natural resources within the CBS. This objective may be expanded to other management zones as they are developed. This is linked to the Protected Areas Management section of the CBS Strategic Plan as well as to the mission of the CBS that calls for conserving the natural resources of the CBS through education, eco- cultural tourism, scientific research, and promotion of cottage industries for the socio- economic benefit of the communities and ecological integrity of the Belize River Valley area.

The threats to biodiversity in the CBS are discussed in **Section 3.2** of this report and the Natural Resource Management Programme is built around addressing those threats. Thus, the Programme is divided into a number of specific objectives that are noted below and in Table 44.

Objective 1:	**Maintain a Viable Population of Black Howler Monkeys**
Objective 2:	**Monitor Landholder Conservation Pledges**
Objective 3:	**Maintain 66 ft Forest Reserve Buffer along Belize River and all Watercourses**
Objective 4:	**Address Overexploitation of Fish, Reptile and Wildlife Species in and Around the CBS**
Objective 5:	**Create Management Zones in Greater CBS Area to Increase the Scope and Depth of Management**
Objective 6:	**Develop Strategic Partnerships with Conservation NGOs and GOB concerning CBS Linkages to the Northern Biological Corridor**
Objective 7:	**Promote Reforestation and Ecological Restoration of Degraded Lands in the CBS**
Objective 8:	**Develop a Strategy to Deal with the Issue of Free-Ranging Cattle**
Objective 9:	**Wildfire Management Planning**

In addition to the objectives listed above, there is another recommendation that concerns land development and land request procedures and policies.

The recommendation is that all requests for land use inside CBS villages be run through CBS and the CBSWCG. Currently recommendation requests come though Lands and Survey, then to the Chairman of Village Council and then to the Area Representative. Currently, all land transactions need to be recommended by the Area Representative. By including the CBS in these deliberations, the CBS can have a voice and may have the opportunity to vet national land transactions that could impact the CBS and its status as an IUCN Category IV Protected Area.

Table 44. Summary of Natural Resource Management Programme Objectives and Actions.

A. Natural Resource Management Programme					
Maintain a viable black howler monkey population by protecting habitat for howlers and other wildlife species and conserve the natural resources of the Community Baboon Sanctuary					
CODE	**Management Actions**	**Present Status**	**Desired Status**	**Year**	**Requirements**
Objective 1: Maintain a Viable Population of Black Howler Monkeys					
A1	Conduct regular censusing of howlers	No recent census data	Up to date census every 2-3 years	1-5	Partnering with scientists (Belize or foreign) Building in-house capacity for censusing
Objective 2: Monitor Landholder Conservation Pledges					
A2	Maintain updated landowner database	No recent update	Updated database with all current CBS members	1	Visiting all properties in CBS to determine current ownership and status
A3	Re-pledge all CBS landowners	No recent pledge updates	updated conservation/management plans	1	Develop new conservation/management plans for all landowners; re-sign pledges
A4	Monitor forest clearing and land use in CBS	Recent flyover in 2012	Flyovers and assessments every 2 years	3	Flyovers and data recording every two years
Objective 3: Maintain 66 ft Forest Reserve Buffer along Belize River and all Watercourses					
A5	Advocate for the enforcement of the 66 ft reserve	No enforcement; minimal awareness	Widespread protection of the 66 ft reserve	1-5	Advocate with Forest Department and GOB Landowner/Public Awareness Campaign
Objective 4: Address Overexploitation of Fish, Reptile and Wildlife Species in and Around the CBS					
A6	Create a Mussel Creek Task Force to explore enforcement	No Task Force exists	A functioning Task Force addressing and enforcing overexploitation issues	2-5	Working partnerships between CBS, Police, Forest and Fisheries Departments and local stakeholders (around Mussel Creek)
A7	Recruit and Train Special Constables and develop Patrolling Programme	No formal Programme in place	Fully trained Constables Operational Patrolling Programme Effective enforcement		Working partnerships between CBS, Police, Forest and Fisheries Departments and local stakeholders (around Mussel Creek)
A8	Plan for Mussel Creek to become an IUCN Category VI Protected Area	No planning done	The Mussel Creek Task Force works to establish Protected Area	2-5	Development of a Protected Area Plan Co-Management Plan for local stakeholders

Table 44. Summary of Natural Resource Management Programme Objectives and Actions.

CODE	Management Actions	Present Status	Desired Status	Year	Requirements
Objective 5: Create Management Zones in Greater CBS Area to Increase the Scope and Depth of Management					
A9	Create and map out Zones	Zones not yet established	Distinct management zones with distinct management plans	1-3	Clear delineation of zones and management objectives in each zone
A10	Expansion of CBS into May Pen Village and toward Labouring Creek	No expansion has yet occurred	Pledged landowners from May Pen to Labouring Creek along the Belize River	2-4	Mapping of new properties Contacting landowners and developing plans Landowner pledging to follow plans
A11	Expand voluntary pledge system and conservation/management plans to other land zones	Only pledges for CBS currently are in place	Management plans and voluntary pledges for all regional lands to promote conservation	3-5	Mapping of new properties Contacting landowners and developing plans Landowner pledging to follow plans
A12	Development of Management Plans for each zone	Only CBS zone is currently engaged in developing a plan	An operational management plan for each management zone	3-5	Setting objectives for each zone Developing management plans
Objective 6: Develop Strategic Partnerships with Conservation NGOs and GOB concerning CBS Linkages to the Northern Biological Corridor					
A13	Form working group to discuss conservation planning for the Corridor	No working group exists	Active working group developing and implementing strategies for Corridor protection	2-5	Working partnerships between CBS, Conservation NGOs, Forest and Fisheries Departments, regional protected area managers and local stakeholders in the proposed Corridor
Objective 7: Promote Reforestation and Ecological Restoration of Degraded Lands in the CBS					
A14	Use the new CBS nursery to grow and distribute howler food trees around the CBS	Programme is in early phases	The CBS nursery supports several restoration projects and tree distribution initiatives	1-5	Funded nursery operation Mechanisms to protect seedlings after they are planted (e.g., fencing)
Objective 8: Develop a Strategy to Deal with the Issue of Free-Ranging Cattle					
A15	Advocate for political discussion on the impacts of free-ranging cattle in the Belize River Valley	No formal advocacy or discussions are occurring	Development of a cattle control programme	1-5	Change in local by-laws of Village Councils Act Forum to discussion options such as penning, barriers and cattle exclusion zones
Objective 9: Wildfire Management Planning					
A16	Develop village-based fire prevention and suppression programmes	No current planning is occurring	Operational fire prevention plan Operational fire suppression plan		Work with landowners to set guidelines Coordinate fire control efforts if possible

4.5.2 Research and Monitoring Programme

Overall Objective: To facilitate applied conservation, socio-economic and ecotourism research towards increasing both management effectiveness and biodiversity conservation, and to ensure effective monitoring and evaluation

The objective of the Research and Monitoring Programme is to effectively manage both research and conservation monitoring activities conducted in the CBS. The Programme involves three research areas: scientific-based conservation research; socio-economic research and ecotourism research, as well as conservation monitoring programmes. While ecotourism could certainly be considered part of socio-economic research, it has been separated out because of its importance in generating revenue for CBS operations.

In the Draft Operations Manual for the CBS developed in 2010, Section VIII outlines policies, guidelines and protocols applicable to researchers throughout the duration of their stay at the CBS. Section VIII excerpted from the Manual is shown below. The complete Operations Manual can be found in Annex D.

a. **Guidelines**
Researchers must identify the following preferably when booking or upon arrival to the CBS with the administrative officer.
   i. Using a researcher form, researchers must identify:
      1. The duration of their stay
      2. What topics/ thesis they are researching
      3. The organization or institution they are affiliated with
      4. What resources CBS must supply or assist with regarding food and accommodations, guides or other resources that will help them achieve their goals during their stay
      5. How their research will benefit the CBS
   ii. The CBS in conjunction with the Environmental Research Institute (ERI) requests that all research conducted at the CBS be made available at the ERI and the CBS.

b. **Protocols**
This subsection highlights procedures that researchers must follow prior to, upon and after arrival to CBS.
   i. Researchers must present a valid permit from the Forest Department to the CBS.
   ii. CBS should request that research groups upon completion of the document provide CBS with a copy of their research findings.
   iii. Once research group fees are fully paid, they have access to the CBS and their resources from the hours agreed to by CBS.
   iv. Groups must respect the sanctuary and its property – leave nothing, take nothing.
   v. Researchers must adhere to visitor policies for their personal safety and management purposes.
   vi. Groups should communicate with CBS two weeks prior to arrival and inform if any assistance or resources that may be supplied by the CBS is needed (e.g. accommodations, food, guides, etc.).

c. **Scheduling**
This section is applicable for management purposes. Scheduling is important at the CBS because it allows management to adequately prepare for large groups while additionally ensuring that resources and requests are met. When using the CBS for research purposes:
   i. International researchers must notify CBS one month prior to arrival.
   ii. Local researchers (not staying) must inform at least one week or 5 working days.

d. **Researcher Form Database**
Entries made on to the CBS researcher Form will be entered into a database when available, likely by a Peace Corps Volunteer. Using the completed researcher form, Researcher information will be entered into a database for statistical use.

Scientific-Based Conservation Research
Scientific research refers to research being conducted and/or directed by professionals. Those involved in such research would include University faculty and students from Belizean institutions and foreign Colleges and Universities, qualified Peace Corps Volunteers and qualified NGOs. Scientific research is only of immediate value to the CBS if (1) the research is conducted in collaboration with the CBS management team, (2) the research is informing management of natural resources in the CBS region and (3) the CBS is guaranteed to get both a copy and interpretation of the results appropriate for CBS staff and the CBSWCG.

Socio-Economic Research
The line of research focuses on social and or economic activities in the Belize River Valley. This type of research has not been as prevalent at the CBS relative to scientific/conservation research, but it should be encouraged as it provides a unique form of assessment of socio-economic activities and initiatives in the area.

Ecotourism Research
There is a unique opportunity to encourage eco-cultural tourism research within the CBS. Again, it should be encouraged as it provides a unique form of assessment of ecotourism activities and initiatives in the area and this can help inform ecotourism management

Table 45 provides a summary of the Research and Monitoring Programme objectives and actions.

Table 45. Summary of Research and Monitoring Programme Objectives and Actions.

B. Research and Monitoring Programme					
To facilitate applied conservation, socio-economic and ecotourism research towards increasing both management effectiveness and biodiversity conservation, and to ensure effective monitoring and evaluation					
CODE	**Management Actions**	**Present Status**	**Desired Status**	**Year**	**Requirements**
Objective 1: All Researchers Follow Guidelines, Protocols and Scheduling Requests Outlined in the CBS Operations Manual					
BI	Formally adopt all procedures in Operations Manual	Operations Manual is in draft form	Clear procedures are operational	1-2	CBSWCG approval of Operations Manual Fee scheduled developed
Objective 2: Develop a Database System for Research and Monitoring Data					
B2	Develop the database at the CBS	No current database exists	Functional database with all relevant data and info entered	2-5	Organizational framework for database Expertise in data entry
Objective 3: Encourage Research in and Around the CBS					
B3	Encourage black howler monkey research in CBS	No active recruitment of scientists	Partnerships with scientists Active research programmes in CBS	1-5	Outreach to researchers Clear research guidelines developed
B4	Encourage black howler censusing partnerships	No active census programme	Regular censusing of howlers in CBS	2-5	Research expertise in censusing Engagement of locals in censusing
B5	Encourage socio-economic research in CBS	No active recruitment of researchers	Partnerships with researchers Active research programmes in CBS	2-5	Focus on community development projects Engagement of locals in research
B6	Encourage ecotourism research	No active recruitment of researchers	Partnerships with researchers Active research programmes in CBS	2-5	Focus on community development projects Engagement of locals in research
Objective 4: Establish and Equip Field Research Center at the CBS					
B7	Create a Research Center Facility in CBS	No Research Center exists	Stocked Research Center Active use of Center	2-5	Financial resources for procurement Equipment donations

4.5.3 Community Development Programme

Overall Objective: To promote cottage industries for the socio- economic benefit of the communities and ecological integrity of the Belize River Valley area

The objective of the Community Development Programme is based on the 2011 CBS Strategic Plan. The Plan focuses, in part, on building the capacity of CBSWCG's staff members and stakeholders in promoting cottage industry development, mainly through training. In addition, the Plan focuses on developing the eco-cultural tourism product of the CBS area, with an emphasis on the rich Kriol culture. The strategies proposed to achieve this goal are product development, development of cottage industries and marketing and promotion.

It is necessary to build capacity, offer training and guidance, facilitate research and development of new products and cottage industries, and ultimately provide markets for products (Salafsky et al. 2001; UNIDO 2003). Micro- and small-scale enterprises (MSE) are affordable and manageable by rural people. They create a large number of non-agricultural jobs and income opportunities in relatively poorly developed areas and require small capital and little sophisticated managerial and technical skills. MSEs are also the seedbeds for a broad development of the private sector throughout the country, forming the foundation for social development at the grassroots (UNIDO 2003).

While crafts and small-scale economic projects should not be developed by outside interventions, the linkage with tourism within the CBS does provide a potential market stream as do Villages in the Belize River Valley and easy road access to Belize City.

The specific objectives under this Programme are noted below and in Table 46.

Objective 1:	**Assist Landowners in Identifying Economic and Other Opportunities**
Objective 2:	**Coordinate Training for Cottage Industries**
Objective 3:	**Develop Micro-Financing Opportunities for CBS Landowners**
Objective 4:	**Promote the Production of Local Crafts**
Objective 5:	**Assist Existing Projects and CBOs**

Table 46. Summary of Community Development Programme Objectives and Actions.

C. Community Development Programme					
To promote cottage industries for the socio- economic benefit of the communities and ecological integrity of the Belize River Valley area					
CODE	**Management Actions**	**Present Status**	**Desired Status**	**Year**	**Requirements**
Objective 1: Assist Landowners in Identifying Economic and Other Opportunities					
CI	Hold series of workshops and meetings	No established assistance programme	Regular formal meetings of landowners and stakeholders	1-2	Appropriate workshop agendas Overcome logistical issues
Objective 2: Coordinate Training for Cottage Industries					
C2	Organize specific training programmes for landowners and CBOs	Minimal coordinated training	Regularly sponsored training programmes Specific requests are met	2-5	Funding for training sessions Overcome logistical issues Sufficient training to build capacity
Objective 3: Develop Micro-Financing Opportunities for CBS Landowners					
C3	Create a budget line Develop details of financial programme	Financing is now primarily through outside agencies (PACT and UNDP/GEF)	Functioning micro-finance programme Establish a revolving fund	1-5	Proper programme organization Proper programme evaluation Proper project follow-up
C4	Create and maintain a database of all economic activities in the region	No database currently exists	Functional database Ability to share experiences Opportunities for partnerships	2-5	Proper database organization Database accessibility Keeping database accurate and current
Objective 4: Promote the Production of Local Crafts					
C5	Develop research and development workshops on craft design and production	No craft programmes currently are in place	Research and design of crafts Emphasis on Kriol culture Entrepreneurial atmosphere	2-5	Adequate resources for research and development Development of niche products
C6	Identify markets for products	Little market analysis is done	Development of markets prior to production	2-5	Analysis of crafts market in Belize Developing a 'Kriol niche' for products
Objective 4: Enhance and Expand Home-Stay Programme					
C7	Promote a Kriol home-stay package	No formal programme in place	Provide authentic experiences	2-5	Work with home-stay providers
C8	Expand Home-Stay Programme	Limited participation outside Bermudian Landing	Home-stays set up in all villages Home-stays part of tour package	2-5	Working with home-stay providers Coordinating tour groups with providers
C9	Market home-stay programme	Minimal marketing at present	Fixture of eco-cultural tourism	2-5	Sufficient participation for marketing

Table 46. Summary of Community Development Programme Objectives and Actions.

CODE	Management Actions	Present Status	Desired Status	Year	Requirements
Objective 5: Assist Existing Projects and CBOs					
C10	Assist Cohune Processing Facility in Flowers Bank	Operating mostly independently	Full partnership with CBS CBS assists in cohune management and marketing	1-5	TOR for relationship CBS marketing of cohune oil in gift shop Development of a marketing plan
C11	Assist Dauntless Designers in Double Head	Operating mostly independently	Full partnership with CBS CBS assists in training , finance and marketing	1-5	TOR for relationship CBS marketing of products in gift shop Development of a marketing plan
C12	Follow-Up on previously funded projects	Minimal follow-up/evaluation of previous grant programmes	Follow-up on all projects Assess projects with a future	1-5	

4.5.4 Tourism Programme

Overall Objective: Development of the eco-cultural tourism product of the CBS area, with an emphasis on the rich Kriol culture

Tourism in Belize is one of the most important industries to the Belizean economy, representing approximately 25% of the country's foreign exchange. Tourism in Belize can be divided into two broad categories: cruise ship visitors who visit Belize for the day, and overnight visitors. In 2010, approximately three-quarters of the one million people who traveled to Belize came from cruise ships. All cruise ship passengers enter Belize through Fort George in Belize City, and with ship time constraints, visitors are limited in their destinations within the country.

Eco-Cultural Tourism

The 2011 CBS Strategic Plan calls for pursuing eco-cultural tourism development by implementing three major strategies: (1) Product Development; (2) Development of Cottage Industries; and (3) Marketing and Promotion. The management actions related to cottage industries have been preciously addressed in **Section 4.5.5**. The eco-cultural tourism Programme discussed here thus focuses on strategies (1) and (2). Given that tourism is the most important revenue stream for the CBS, developing and implementing a quality tourism programme is essential to the financial sustainability of the CBS. A financially strong tourism programme is also the primary driver for the CBS and CBSWCG to fully achieve their mission. In short, growing tourism revenues are critical for the CBS.

The CBS eco-cultural tourism programme can be thought of as a traditional ecotourism programme. To reflect the organization's vision and mission, the Community Baboon Sanctuary has adopted the IUCN definition (Cebalos-Lascurain 1996), which describes ecotourism as:

> *Environmentally responsible travel and visitation to natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features, both past and present) that promote conservation, have a low visitor impact and provide for beneficially active socio-economic involvement of local peoples.*

Although several definitions of ecotourism have been generated (Orams 1995, Wight 1993, Boyd and Butler 1996, Mandziuk 1995, Herath 1996, Buckley, 1994, Lindberg et al. 1996, Nelson 1994), there are some commonalities that exist among the varying definitions:

- Nature-based tourism
- Appreciation of nature as the primary motive for participation
- Supporting the conservation of natural resources
- Providing economic opportunities to local communities and its members
- Respect for the local culture and minimizing social impacts
- Promoting environmental education to visitors

The Community Baboon Sanctuary is ideally located to tap into this pool of potential tourists. Table 47 provides a summary of Tourism Programme Objectives and actions.

Table 47. A summary of Tourism Programme objectives and actions.

D. Tourism Programme					
Development of the eco-cultural tourism product of the CBS area, with an emphasis on the rich Kriol culture					
CODE	**Management Actions**	**Present Status**	**Desired Status**	**Year**	**Requirements**
Objective 1: Increase the Number of Tourists and Tourist Revenues via a Marketing Plan					
D1	Develop a complete tourism marketing plan	Only pieces of a larger plan in place	Functional Plan Successful implementation	1-2	Marketing skills among CBS staff and Board Outreach to national tour operators
D2	Collaborate with tour operators, BTB and BTIA	Very little collaboration	Working relationships in place Capacity building partnerships	1-2	Travel to Belize City and elsewhere Resources to build collaborations
D3	Develop a unified fee structure	Not in place	Clear, fee structures in place	1	CBSWCG agreement; environmental scan
Objective 2: Develop Tourist Packages Focused on Nature, Culture and Educational Adventure					
D4	Develop tourist packages	Some partial packages in place	Complete packages offered	1-2	Capacity to construct packages of interest
D5	Pilot package delivery in all villages	Mostly in Bermudian Landing	Village tour packages developed	1-2	Capacity in each village Logistics and effective package delivery
Objective 3: Develop New Website and Social Media Capacity					
D6	Re-design CBS website	Website outdated	Interactive, content rich website	1	Expertise in web page maintenance
D7	Create online booking option	Email and phone	Fast, easy online booking	1-2	Expertise in online booking and tracking
Objective 4: Improve Museum Exhibits and Infrastructure					
D8	Update CBS museum exhibits	In progress	Complete update	1	External funding for poster preparation
D9	Expand CBS Gift Shop	In progress	Complete expansion	1	Resources and labor to complete project
Objective 5: Improve and Expand Trail Infrastructure					
D10	Develop new trail systems	Reliance on a single trail	Multiple trail options	1-2	Property access; labor and resources
Objective 6: Have CBS Staff Attend Tourism Trade Shows in Belize and Elsewhere					
D11	Represent CBS at trade shows in Belize	Minimal participation	Full participation Effective displays	2-5	Resources to construct exhibits Staff time and expertise

Table 47. A summary of Tourism Programme objectives and actions.

CODE	Management Actions	Present Status	Desired Status	Year	Requirements
Objective 7: Establish a Kriol Cultural Center within the CBS					
D12	Refurbish Kriol Center in St. Paul's Village	Currently in disrepair	Open and furbished Center	1-2	Construction materials and labor Local management group
D13	Plan for a national Kriol Culture Center in the CBS	No center exists in Belize	New facility within CBS Center with national stature	2-5	Large funding requirements Determination of a suitable location
Objective 8: Organize Annual CBS Anniversary Celebration and Environmental Fair					
D14	Hold annual CBS event to celebrate landowners, increase public awareness and to promote and market the CBS concept and brand	Annual CBS celebration muted	Large national event Opportunity to sell local goods Linked to tourist traffic Landowners appreciated	1-5	Financial resources to run event Staff time and preparation Logistics and organizational plan
Objective 9: Provide Additional Tour Guide and Staff Training					
D15	Provide tour guide training	Infrequent training	Regular training programme	1-5	Resources to support training costs
D16	Provide staff training	Infrequent training	Regular training programme	1-5	Resources to support training costs

4.5.5 Infrastructure Management Programme

Overall Objective: Develop facilities and infrastructure that foster eco-cultural tourism, provide appropriate spaces for CBS administration and reflect the Kriol character of the region

The CBS currently owns several buildings, out buildings and structure on the site in Bermudian Landing. These entities represent the current infrastructure at the CBS and are summarized in Table 48.

Table 48. A summary of current building infrastructure at the CBS.

Infrastructure	Size	Year Built/Acquired
CBS Museum	40 ft x 26 ft	1989
CBS Education Center	40 ft x 26 ft	2003
CBS House	30 ft x 20 ft	2001
Storage Shed	8 ft x 8 ft	?
Thatch roof pavilion	12 ft x 24 ft	2003
Nursery	20 ft x 14ft	2012
Water Cistern	2500 liters	

The CBS also operates a trail system in Bermudian Landing on a small parcel of land. The trail system is currently restricted to this area in part due to the neglect of other trails and in part due to the fires that occurred throughout the Sanctuary in 2011 (it is estimated that 70 – 75% of the CBS experienced some level of fire disturbance).

Museum Alignment with CBS Mission

The Museum needs to be re-aligned with the CBS mission. This means that the exhibits and central focus need to better reflect live in the Belize River Valley. An initial alteration of the museum began in spring 2012. The CBSWCG needs to review the current contents of the museum and make recommendations on what exhibits might be appropriate to communicate the mission of the CBS and the Kriol lifestyle in the region. Given the current state of infrastructure at the CBS, several management actions are recommended. These recommendations are presented in Table 48. It should be noted that some of the objectives and management actions pertaining to the Tourism Development Programme has also been included in Table 48 to highlight areas of overlap.

Table 48. A summary of Infrastructure Development Programme objectives and management actions.

E. Infrastructure Development Programme					
Develop facilities and infrastructure that foster eco-cultural tourism, provide appropriate spaces for CBS administration and reflect the Kriol character of the region					
CODE	**Management Actions**	**Present Status**	**Desired Status**	**Year**	**Requirements**
FROM THE TOURISM DEVELOPMENT PROGRAMME					
D8	Update CBS museum	In progress	Complete update	1	External funding for poster preparation
D9	Expand CBS Gift Shop	In progress	Complete expansion	1	Resources and labor to complete project
D10	Develop new trail systems	Reliance on a single trail	Multiple trail options	1-2	Property access; labor and resources
D12	Refurbish Kriol Center in St. Paul's Village	Currently in disrepair	Open and furbished Center	1-2	Construction materials and labor Local management group
D13	Plan for a national Kriol Culture Center in the CBS	No center exists in Belize	New facility within CBS Center with national stature	2-5	Large funding requirements Determination of a suitable location
Objective 1: Improve Office Space and Operational Efficiency at CBS Campus in Bermudian Landing					
E1	Refurbish office space for Executive Director	Small, cramped office	Larger office for hosting meetings Better file storage	1-2	Resources and labor for refurbishment Space plan for existing buildings
E2	Improve space for Administrative Assistant	No real office, open access	Dedicated space; secure location	1-2	Resources and labor for refurbishment Space plan for existing buildings
Objective 2: Develop a Site Master Plan for the CBS Campus in Bermudian Landing					
E3	Develop a site master plan identifying future growth plans, renovation plans and landscaping	No site master plan exists	Functional CBS campus Plan for growth and expansion Plan a tool for fundraising	1-2	Expertise in site planning Extent of campus envelope for building Security and grazing livestock concerns
Objective 3: Develop Specific Sites in Other Villages to Deploy Tourism Packages					
E4	Develop CBS Village Tours; Identify sites within Villages for nature, cultural and education-adventure tourist packages	Minimal infrastructure exists	Specific sites available in each Village Infrastructure in place for tourists Point persons in Villages identified		Resources for infrastructure development Point persons in each Village Good communication with CBS Evaluation of programme

4.5.6 Administrative Programme

Overall Objective: Provide institutional strengthening for the CBSWCG in order for the Board to effectively implement the strategic plan and build management capacity

The administrative programme is centered on streamlining CBS management to make it more accountable, more transparent and more effective. Much of the direction for the administrative programme came from the 2011 Strategic Plan for the CBS and the analysis noted in **Section 4.1**.

Based on a need assessment conducted as part of the 2011 Strategic Planning process, the results pointed to the continued need for an Advisory Council for capacity building. Such a technical board can be the mechanism for vetting CBS proposals and reviewing CBS operations. While the previous iteration of the Advisory Council was not completely successful, this was mainly due to a lack of communication between the CBSWCG Board and the Advisory Council.

Re-Structuring of CBS Management

One of the most significant recommendations in this management plan is to re-structure the management of the CBS. The CBS needs staff that can carry out its mandate to the communities of the CBS, the Belize River Valley and the country. The management structure of the CBS has involved various iterations in the positions of Communication Officer, Community Development Officer, Protected Areas and Education Coordinator, Project Office and Finance Officer. It is recommended that the roles and responsibilities of each of these positions be evaluated, compiled and re-structured based on prioritized need and funding availability.

One of the key components of this re-structuring is the formation of the new Executive Director position. The position will essentially be a conflation of the current Administrative Officer and Programme Coordinator positions. Given this change, the role of the CBSWCG will also change as will the role of the President of the CBSWCG. The proposed changes also call for enhancing the current Front Desk Position and re-structure it to be called an Administrative Assistant. The basic duties that will be shifted in this position re-alignment are summarized in Table 50.

Table 50. Summary of the re-structuring of CBS Management.
Both the current positions and the re-structured positions are shown.

Current CBS Management and Staff (2013)		**Re-Structured CBS Management**
CBSWCG		
Position	**General Duties**	**Re-Structured General Duties**
CBS Women's Conservation Group (CBSWCG)	• All representatives (one from each CBS village) are responsible for attending monthly meetings • Serve as communication between CBS and respective villages • Plan and host their village's annual community meeting and report back to CBSWCG after meeting	• All existing duties remain the same Additional development will b: • To develop criteria for CBSWCG membership • Oversee Executive Director • Approves projects administered by the CBS
President, CBSWCG	~~• Oversees the daily operations of the CBS~~ ~~• In charge of maintaining staff at the CBS~~ ~~• Approves projects administered by the CBS~~ • Ensures that CBS village representatives are fulfilling their duties ~~• Responsible for landowner pledges~~ ~~• Chief communication person between CBS and landowners~~ • Approves loan "donations" and community requests for funding	• Ensures that CBS village representatives are fulfilling their duties • Chief communication person between Executive Director and CBSWCG • Approves donations and community requests for funding (need criteria)

Current CBS Management and Staff (2012)		**Re-Structured CBS Management**
NEW EXECUTIVE DIRECTOR POSITION		
Old Positions	General Duties	New Executive Director Position
~~Administrative Officer~~	~~• Open the museum each morning~~ • Oversee employee sign in / sign out log ~~• Answer phones~~ • Manage staff schedules and leave requests • Administer staff payroll and benefits ~~• Maintain the CBS website and guest relations~~ ~~• Oversee tour operations~~ ~~• Book tours and manage tour schedule~~ ~~• Assist guests with lodging, meals, and transportation~~ ~~• Assign tour guides to groups~~ ~~• Ensure that guests complete liability forms~~ ~~• Make special arrangements needed for tours~~ • Manage the financial aspects of the CBS • Prepare daily, monthly, and annual cash reports (QuickBooks) • Manage the petty cash fund • Prepare and finalize an annual operating budget • Supervise the cleaning staff, tour guides and weekend staff	CBS Administration • Oversees daily operation of the CBS • Oversee employee sign in / sign out log • Manage staff schedules and leave requests • Administer staff payroll and benefits • Authorizes commission payment • Manage the financial aspects of the CBS • Review and authorize weekly, monthly and annual budget • Oversight of petty cash fund • Prepare and finalize an annual operating budget • Supervise the Administrative Assistant, tour guides, weekend staff, cleaning staff • Prepare quarterly newsletter Programmes (five focal areas) • Chief communication person between CBS and landowners • Responsible for landowner pledges • Develop and coordinate programmes that reflect the vision and mission of the CBS through stakeholder consultations
~~Programme Administrator~~	• Coordinate programmes that reflect the vision and mission of the CBS through	

	stakeholder consultations • Prepare project proposals for funding programmes • Develop action plans and design effective work packages to facilitate effective execution of projects • Keep projects on schedule • Coordinate fundraising activities • Prepare and submit activity, progress, financial and procurement reports • Oversee day to day project implementation and management of all projects • Organize, oversee and support contractors and consultants input • Oversee implementation and timely achievement of all project deliverables • Prepare and submit project reports to CBSWCG on all projects • Engage stakeholders as necessary as possible • Prepare quarterly newsletter • Liaise with GOB and international organizations to form partnerships • Coordinate activities such as CBS anniversary, AGM, elderly Christmas parties, Farmers Market Day, summer programme, Fallet A. Young Scholarship Programme	• Prepare project proposals for funding programmes • Develop action plans and design effective work packages to facilitate effective execution of projects • Fulfill grant reporting requirements • Organize, oversee and support contractors and consultants • Prepare and implement a marketing strategy for the CBS eco-cultural tourism programme (develop relationships with tour operators, market on cruise ship, develop tour packages) • Coordinate programmes such as CBS anniversary, AGM, elderly Christmas parties, Farmers Market Day, summer programme, Fallet A. Young Scholarship Programme Other Duties • Coordinate fundraising activities • Liaise with GOB and international organizations to form partnerships • Engage stakeholders as necessary as possible • Weekly visits to area villages

Table 50. Summary of the re-structuring of CBS Management.
Both the current positions and the re-structured positions are shown.

Current CBS Management and Staff (2012)		Re-Structured CBS Management
Tour Guides	• Greet guests and give introduction to the CBS • Accompany guests on tours • Ensure that guests are properly prepared • Have BTB tour guide certification and up-to-date on BTB policies • Must be knowledgeable on CBS history and the local flora and fauna • Confirm tour schedule with Administrative Assistant	• Greet guests and give introduction to the CBS • Accompany guests on tours • Ensure that guests are properly prepared • Have BTB tour guide certification and up-to-date on BTB policies • Must be knowledgeable on CBS history and the local flora and fauna • Confirm tour schedule with Administrative Assistant
	Front Desk Position	Administrative Assistant
~~Front Desk Position~~	• Manage front desk • Conduct financial transactions with visitors • Prepare daily cash reports • Supervised by the Executive Director	• Open the museum each morning • Answer phones • Manage front desk • Conduct financial transactions with visitors • Prepare daily cash reports\ Maintain the CBS website and guest relations • Oversee tour operations • Book tours and manage tour schedule • Assist guests with lodging, meals, and transportation • Assign tour guides to groups • Ensure that guests complete liability forms • Make special arrangements needed for tours • Supervised by the Executive Director
Cleaning Staff	• Maintain the cleanliness of the buildings and grounds • Clean up facilities after events	• Maintain the cleanliness of the buildings and grounds • Clean up facilities after events

Table 51 provides a summary of the objectives and management actions proposed under the Administration Programme.

Table 51. A summary of Administrative Programme objectives and management actions.

F. Administrative Programme					
Provide institutional strengthening for the CBSWCG in order for the Board to effectively implement the strategic plan and build management capacity					
CODE	**Management Actions**	**Present Status**	**Desired Status**	**Year**	**Requirements**
Objective 1: Clarify and Strengthen the Capacity of the CBSWCG Board					
F1	Review and revise Articles of Association of the CBSWCG	Existing Articles are in place	Articles that clearly define Board roles, responsibilities and policies	1	Legal advisement
F2	Re-activate the CBS Advisory Council	Inactive Council at this time	Fully engaged Advisory Council Providing additional capacity	1	Outreach to Council members Meeting Logistics
F3	Institute a staff appraisal programme	Not in place	CBSWCG control over staff Clear mechanisms of staff review	1	Expertise in staff appraisal programmes
Objective 2: Re-Organize Management Structure					
F4	Create an Executive Director position and hire a Director	Administration complex	Clear chain of command Accountability	1	Re-structuring roles of CBSWCG and staff Control over change by CBSWCG
F5	Re-define the role of the CBSWCG President	Involved in day to day operations of the CBS	Clearly defined role Main conduit between Executive Director and Board	1	Legal advisement Control over change by CBSWCG Establish clear chain of command
F6	Create an Administrative Assistant position and hire	Administration complex	Clearly defined role Support the Executive Director	1	Control over change by CBSWCG Establish clear chain of command
Objective 3: Align Operations Manual with both Strategic Plan and Management Plan					
F7	Adopt a revised Operations Manual that guides day to day activities at CBS	Operations Manual has been drafted but not approved	Clear definition of roles and responsibilities Clear definition of expectations	1	CBSWCG revision of Manual Inclusion of new management structure
Objective 4: Develop Annual Operations and Work Plans					
F8	Based on Strategic and Management Plans, develop annual operations/work plans	Annual plans do not exist	Clear timeline for activities A vehicle for assessment Efficiency in CBS operations		Expertise in developing Plans CBSWCG asserts oversight role All staff aware of expectations
Objective 5: Develop a Board Governance Policy Manual					
F9	Create a policy manual	Does not exist	Clear governance structures		Legal advisement and council

4.5.7 Management Policies

The following policies should be developed to enhance CBS operations and to help achieve all the management objectives outlined in the Management Plan.

Personnel Policy - The CBSWCG should review and re-align, where needed, the 2010 Operations Manual to meet the new management structure and initiatives at the CBS.

Enforcement Policy - The CBSWGS in consultation with CBS staff, local Police Officers and the Forest and Fisheries Departments, should develop an Enforcement Policy that creates standardized procedures for approaching and apprehending people in contravention of environmental regulations and laws. This would need to encompass illegal hunting, fishing and logging activities.

CBS Membership Policy - If the CBS pursues a membership programme where persons outside the CBS join the CBS as members in a fee-based system, there needs to be clear policies to define the relationship, set fee structures and understand CBS obligations to the members and vice versa.

Philanthropy Policy – Table 52 displays the total number and value of donations and loans made by the CBS over the period stretching from October 2010 through May 2012. The numbers listed in Table 52 are the aggregate of loans and donations for each community. The "Outside CBS" category indicates loans or donations made to organizations or individuals not residing or located with one of the seven CBS villages. The "Unknown" category is a result of loans or donations recorded in the accounting system as such, but where no payee was identified. A total of $8,278.14 in donations and loans made to 35 individuals, schools and organizations was recorded by the CBS. This averages out to $413.91 per month or $236.52 per contribution. Bermudian Landing received the greatest amount or financial contributions than any other village with $2,131, or just over 25 percent of total donations and loans. Flowers bank on the other hand did not receive any donations or loans.

Table 52. A summary of CBS philanthropic giving from October 2010 to May 2012.

Village	Total Value	% of Total	# Individ	# Schools	# Orgs	Total Receiving	Avg. per contribution
Bermudian Landing	$2,131.00	25.74%	9	2	0	11	$193.73
Willows Bank	$1,550.00	18.72%	5	0	1	6	$258.33
St. Paul's Bank	$1,372.15	16.58%	5	1	0	6	$228.69
Scotland Half Moon	$1,033.99	12.49%	3	0	0	3	$344.66
Outside CBS	$982.25	11.87%	3	0	2	5	$196.45
Unknown	$766.00	9.25%	-	-	-	6	$127.67
Isabella Bank	$222.75	2.69%	1	0	0	1	$222.79
Double Head Cabbage	$220.00	2.66%	1	1	1	3	$73.33
TOTAL	$8,278.14	100.00%	27	4	4	35	$236.52

Since its inception, the CBS has had an informal philanthropy policy whereby residents and landowners in need have requested funding from the CBS. While a laudable action and attesting to the connection of the CBS in the fabric of life in the Belize River Valley, going forward a clear philanthropy policy should be developed. The policy should include what percent of CBS revenues should go into the philanthropy fund, what criteria will be used to assess need and who will be responsible for dispersing the monies and keeping a record of the transaction.

4.6 Monitoring and Review

Table 53 contains a matrix that could be used for monitoring the strategies, objectives and management actions that will be implemented based on this Management Plan. By comparing the present status with the desired outcomes (desired status), the CBSWCG can review and evaluate the level of progress made on all the management actions.

The development of annual work plans and/or operations plans, will keep the Management Plan a living and adaptive document. The Management Plan management actions should be reviewed twice yearly by the CBSWCG and re-adjusted as needed.

This Management Plan is a living document and the CBSWCG needs to exert its authority and influence if changes in strategy need to be made.

Table 53. An example of a monitoring and evaluation matrix to assess implementation of the Management Plan.

Tracking of Management Action Implementation								
Management Actions		**Present Status**	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**Desired Status**
A1	Conduct regular censusing of howlers	No recent census data						Up to date census every 2-3 years
A2	Maintain updated landowner database	No recent update						Updated database completed
A3	Re-pledge all CBS landowners	No recent pledge updates						Updated conservation plans completed
A4	Monitor forest clearing and land use in CBS	Recent fly-over in 2012						Fly-overs and assessments every 2 yrs
A5	Advocate for the 66 ft Reserve	No enforcement; minimal						Protection of 66 ft Reserve
A6	Create a Mussel Creek Task Force	No Task Force exists						A functioning Task Force
A7	Recruit and Train Special Constables	No formal Programme in place						Fully trained Constables on patrol
A8	Plan for Mussel Creek to become a PA	No planning done						Mussel Creek Task Force in operation
A9	Create and map out Zones	Zones not yet established						Distinct management zones established
A10	Expansion of CBS	No expansion has yet occurred						Newly pledged landowners in expansion zone(s)

4.7 Timeline

The final timeline should be developed and prioritized by the CBSWCG. Table 54 provides a yearly timeline for implementing the primary cross cutting strategies previously presented in Table 33 (**Section 3.3** Strategies to Reduce Threats). Table 55 provides a proposed timeline (by quarter) for implementation of all management actions listed under Programmes (**Section 4.5**).

Table 54. a yearly timeline for implementing the primary cross cutting strategies previously presented in Table 33 (***Section 3.3*** - Strategies to Reduce Threats).

Primary Cross Cutting Strategies	YEAR OF IMPLEMENTATION				
	1	2	3	4	5
Re-structuring, capacity building and institutional strengthening of CBS management					
Updating/Maintaining CBS Landowner Database; regular monitoring of landowner management plans					
Yearly (or every two years) flyover and videotaping of conditions in the CBS					
Create an active Mussel Creek Task Force that includes local residents of Scotland Half Moon adjacent to Mussel Creek, CBS and the Forestry and Fisheries Departments					
Explore creating Mussel Creek as an IUCN Category VI Protected Area					
Explore the use of special constables in the enforcement of environmental laws and statutes					
Flood mapping and flood preparedness					
Fire preparedness and response planning					
Enhance CBS eco-cultural tourism programme and increase tourist visitation to CBS villages					
Develop and implement an eco-cultural tourism marketing plan					
Development community agreement to not clear 66 ft buffer along Belize River					
Create and maintain an updated database on all economic activities in and around the CBS					
Partner with area schools to develop curriculum and activities for conservation and sustainable development					
Re-visit the local policy of allowing free-range cattle; encourage penning of animals					
Create specific management zones in and around the CBS to manage					
Develop specific management plans for each zone					
Expand CBS towards Labouring Creek and into May Pen Village					
Link CBS management with the Northern Biological Corridor					
Coordinate a civic pride campaign in schools and establish recycling, solid waste management and sustainable living campaigns					
Increase the number and scope of community development programmes in Belize River Valley					
Increase collaboration with regional conservation partners and NGOs					

Table 55. A proposed timeline (by quarter) for implementation of all management actions listed under Programmes.

Timeline of Management Action Implementation																					
Management Actions		**1st Year**				**2nd Year**				**3rd Year**				**4th Year**				**5th Year**				**Desired Status**
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Natural Resource Management Programme																						
A1	Conduct regular censusing of howlers																					Up to date census every 2-3 years
A2	Maintain updated landowner database																					Updated database
A3	Re-pledge all CBS landowners																					Updated conservation plans
A4	Monitor forest clearing and land use																					Flyovers and assessments every 2 yrs
A5	Advocate for the 66 ft Reserve																					Protection of 66 ft Reserve
A6	Create a Mussel Creek Task Force																					A functioning Task Force
A7	Recruit and Train Special Constables																					Fully trained Constables
A8	Plan for Mussel Creek to become a PA																					Mussel Creek Task Force in operation
A9	Create and map out Zones																					Distinct management zones
A10	Expansion of CBS																					Newly pledged landowners
A11	Expand voluntary pledge system																					Management plans/voluntary pledges
A11	Development of Zone Management																					Zone-based management plan in place
A12	Form No. Corridor Working Group																					Active Working Group discussions
A13	Use the new CBS nursery for planting																					CBS nursery fully operational
A14	Discussion on Free-Range Cattle																					Develop a cattle control programme
A15	Village based fire prevention planning																					Operational fire prevention plan
Research and Monitoring Programme																						
B1	Adopt Operations Manual																					Clear procedures are operational
B2	Develop research database																					Functional database
B3	Encourage black howler research																					Active research programmes in CBS
B4	Encourage black howler censusing																					Regular censusing of howlers
B5	Encourage socio-economic research																					Active research programmes in CBS
B6	Encourage ecotourism research																					Active research programmes in CBS
B7	Create CBS Research Center																					Active use of Center

Table 55. A proposed timeline (by quarter) for implementation of all management actions listed under Programmes.

Management Actions		1st Year				2nd Year				3rd Year				4th Year				5th Year				Desired Status
Community Development Programme																						
C1	Economic opportunity workshops																					Regular formal meetings
C2	Training sessions for cottage industries																					Regularly sponsored training
C3	Develop micro-financing budget																					Functioning micro-finance programme
C4	Economic activity database formation																					Functional database
C5	Craft design and production workshops																					Research and design of crafts
C6	Identify markets for products																					Development of markets
C7	Promote a Kriol home-stay package																					Provide authentic experiences
C8	Expand Home-Stay Programme																					Home-stays set up in all villages
C9	Market home-stay programme																					Fixture of eco-cultural tourism
C10	Assist Cohune Processing Facility																					Full partnership with CBS
C11	Assist Dauntless Designers																					Full partnership with CBS
C12	Previous development project follow-up																					Follow-up on all projects
Tourism Programme																						
D1	Develop a tourism marketing plan																					Functional Plan
D2	Collaborate w/tour operators, BTB, BTIA																					Working relationships in place
D3	Develop a unified fee structure																					Clear, fee structures in place
D4	Develop tourist packages																					Complete packages offered
D5	Pilot package delivery in all villages																					Village tour packages developed
D6	Re-design CBS website																					Interactive, content rich website
D7	Create online booking option																					Fast, easy online booking
D8	Update CBS museum exhibits																					Completed update
D9	Expand CBS Gift Shop																					Completed expansion
D10	Develop new trail systems																					Multiple trail options
D11	Represent CBS at trade shows																					Full participation
D12	Refurbish Kriol Center in St. Paul's																					Open and furbished Center
D13	Plan for a national Kriol Culture																					New facility within CBS
D14	Hold annual CBS event																					Large national event
D15	Provide tour guide training																					Regular training programme
D16	Provide staff training																					Regular training programme

Table 55. A proposed timeline (by quarter) for implementation of all management actions listed under Programmes.

Management Actions		1st Year				2nd Year				3rd Year				4th Year				5th Year				Desired Status
Infrastructure Management Programme																						
E1	Refurbish office space for ED position																					Larger office; better storage; secure
E2	Improve space for AA position																					Dedicated space; secure location
E3	Develop a site master plan																					Completed Site Plan
E4	Develop CBS Village tours																					Site, tours, infrastructure in place
Administrative Programme																						
F1	Revise CBSWCG Articles of Association																					Clearly defined Board roles, responsibilities and policies
F2	Re-activate the CBS Advisory Council																					Fully engaged Advisory Council
F3	Institute a staff appraisal programme																					CBSWCG control over staff
F4	Create an Executive Director position																					Clear chain of command
F5	Re-define role of the CBSWCG President																					Clearly defined role
F6	Create Administrative Assistant position																					Clearly defined role
F7	Adopt revised Operations Manual																					Clear definition of roles and responsibilities
F8	Develop annual operations/work plans																					Clear timeline for activities
F9	Create a Governance policy manual																					Clear governance structures

4.8 Financing

As noted previously in **Section 2.6.3**, the majority of CBS operational revenues come from tourist fees but the CBS and The CBSWCG have also had extraordinary success over the past 15 years securing grant monies for specific projects. Both revenue streams will be needed to achieve financial sustainability and for the CBS and the CBSWCG to achieve their vision and mission. To reach financial stability and sustainability, the CBSWCG needs to focus on building its capacity for financial planning and financial management.

Using Fiscal Year (FY) 2012 revenue and expense data as a baseline can be useful in constructing planning scenarios to achieve desired levels of revenue. The revenue from tourism activities for FY 2012 is shown below.

Activity	Revenues Generated	% of Total Revenues
Tours	$55,863.00	76.01%
Donations	$3,613.00	4.92%
Gift shop	$3,125.00	4.25%
Catering	$2,184.00	2.97%
Cafeteria sales	$1,220.90	1.66%
Home stay	$936.00	1.27%
Camping	$785.00	1.07%
TOTAL	**$67,726.90**	**92.15%**

Total revenues for FY 2012 totaled $73,496.75 and expenses totaled $63,880.42. This resulted in a net profit of $9,616.33. Scaling these number up, relative to the number of tourist visits provides a rough estimate of what net revenues would be based on various tourism numbers scenarios. For example, there were roughly 4,550 documented visitors to the CBS in FY 2012. Doubling this number to 9,000 and using it as a target, the gain in net revenues can be predicted.

In addition, focusing on tourist packages with larger groups of tourists can have a multiplier effect on net revenues. For example, if the CBS was able to employ economies of scale by the number of large groups relative to the total number of tours. In reviewing the average cost per visitor, the CBS averaged $15.50 per visitor (via commissions etc.). In July 2011 when larger groups dominated the tourist traffic, the average gain per visitor was only $6.70, nearly two and a half times less than the annual average. Thus larger groups correspond to more net revenues for the CBS. This is one reason why focusing on package tours in the CBS holds promise.

A Statement of Activities for FY 2012 is presented on the next page to show a more detailed description of revenues and expenses.

Statement of Activities

For the year ending March 31, 2012

Ordinary Income/Expense	
Income	
Tours	$55,863.00
Donations	$3,613.00
Rent	$3,550.00
Gift shop	$3,125.00
Catering	$2,184.00
Loan Repayment	$1,320.50
Cafeteria	$1,220.90
Home Stay	$936.00
Camping	$785.00
Computer Services	$464.35
Other Income	$435.00
Total Income	$73,496.75
Expense	
Stipends & Salaries	$18,130.00
Commissions	$13,333.88
Equipment Rental	$4,037.50
Other	$3,275.13
Marketing	$3,094.00
Supplies	$2,927.45
Utilities	$2,672.10
Catering Expense	$2,366.50
Loans	$2,125.00
Travel	$1,997.00
Other expense	$1,696.36
Home-stay	$1,360.00
Gift Shop Expense	$1,269.75
Maintenance & Repairs	$1,713.97
Community Donations	$973.00
Cafeteria Expense	$750.81
Summer Camp	$714.00
Social Security	$708.40
General sales Tax	$500.00
Postage	$235.57
Total Expense	$63,880.42
Net Income	**$9,616.33**

Overall, there is no one magic bullet for the CBS to achieve financial sustainability. It will require action on several fronts. It will require energy, creativity and time but once established, they will help the CBS achieve its vision and mission. Strategies to bolster revenues include:

a) Increasing tourist visits to the CBS – this generates more fee based revenues

b) Increase the number of package tours for larger groups – these generate more revenue than single or smaller group visits

c) Continue seeking grant monies to fund projects – the CBS has had great success in this area and should continue to pursue grant monies

d) Develop an external membership system – The CBS needs to take control of the adopt-a-howler and other membership programs and directly receive these revenues

e) Developing a unified fee structure – This will ensure the CBS captures revenue not only from tourists, but also researchers, filming crews, building rentals, equipment rentals, school group fees, site user fees and other non-conventional uses of the CBS

f) Develop fundraising programs – The CBS needs to be proactive is seeking funds from former visitors to the CBS, interested international organizations and others of interest

g) Infrastructure improvements at CBS campus – This includes building a new gift shop, enhancing the CBS grounds and providing more amenities to tourist visitors

h) Enhancing museum exhibits – The more attractive and interesting the exhibits in the CBS museum, the more time and interest visitors will show

i) Developing relationships with U.S. Colleges and Universities – Numerous school groups have visited the CBS in recent years; outreach to these groups to have them assist in creative forms of fundraising, in-kind donations and meaningful and directed service to the CBS needs to be increased

In the coming year, the CBSWCG will have an opportunity to explore a range of new revenue generating strategies. Financial planning assistance may be required to strengthen the institutional capacity of the CBSWCG. The focus on tourism is proposed because a tourist program already exists, it has been financially fruitful in the past and it provides an immediate mechanism to increase CBS revenues.

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