



**BELIZE
AUDUBON
SOCIETY**

Newsletter

Creating a balance between People and the Environment.

Volume 38: Number 3

November 2006

Summer Camps 2006



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Management*

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NEWSLETTER
Vol. 38 No. 3
November, 2006

Belize Audubon Society

Vision

The Belize Audubon Society (BAS) will be a strategic leader in building a nation in which people in Belize live in harmony with and benefit from the environment.

Mission

The Belize Audubon Society is a non-governmental membership organization dedicated to the sustainable management of our natural resources through leadership and strategic partnerships with stakeholders in order to create a balance between people and the environment.

See anything you like?

Please feel free to quote or copy any information you find here. Just remember to give proper credit: Author, Year. Belize Audubon Society Newsletter Vol. (#) p.

What do you think?

We invite our readers to submit articles, photographs, or artwork for publication in the *Belize Audubon Society Newsletter*. Letters and emails are also appreciated. We want to hear from you, our readers! What subjects would you like covered in future issues? What environmental issue is on your mind?

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Belize Audubon Society



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FRONT COVER

Photographs by Dirk Francisco; Collage by Judy Lumb

INSERTS

Kid's Corner: "Track Tracking" by Israel Manzanero, Jr., Park Warden and Field Educator, St. Herman's Blue Hole National Park

Membership Form: Please update your membership information, send BAS a comment, or pass the form to someone who might join BAS!

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Belize Audubon Society

BAS History

Since its formation in 1969 BAS has been Belize's foremost environmental organization protecting Belize's precious natural resources while educating the public about their value and sustainable use. BAS has grown from an all-volunteer organization with 55 charter members to a Society of over 1,700 members with a staff of more than 40 dedicated professionals.

Throughout its history, BAS has been involved in the development of the legal framework and policy for environmental protection in Belize. From the initial Wildlife Protection and National Parks System Acts in 1981 to the recent National Parks System Plan, BAS has been instrumental in the financing, development and management of protected areas. At the request of the Government of Belize, BAS currently manages nine of Belize's protected areas with a well-trained, knowledgeable staff, most of whom are from the surrounding buffer communities. Environmental education and advocacy activities revolve around these protected areas and their buffer communities.

BAS member activities include the Annual General Meeting and field trips such as the Christmas Bird Count, October Bird Festival, and trips to the protected areas.

Staff

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Publicity Coordinator
Dirk Francisco

Office Assistant
Mauricio Uk

Housekeeping
Donna Bull

BAS-Managed Protected Areas

Actun Tunichil Muknal Natural Monument (ATMNM)
455 acres—established 2004
Uriah Rhaburn, Park Director

Blue Hole Natural Monument (BHNM)
1,043 acres—established 1996
Kenneth Gale, Park Director

Cockscomb Basin Wildlife Sanctuary (CBWS)
128,000 acres—established 1985
Nicascio Coc, Park Director

Crooked Tree Wildlife Sanctuary (CTWS)
41,297 acres—established 1984, Declared Ramsar Site 1996
Position Open

Guanacaste National Park (GNP)
50 acres—established 1973
Ronald Richards (acting), Park Director

Half Moon Caye Natural Monument (HMCNM)
9,771 acres—established 1928 as a Crown Reserve
Kenneth Gale, Park Director

St. Herman's Blue Hole National Park (SHBHP)
575 acres—established 1986
Rennie Jones, Park Director

Tapir Mountain Nature Reserve (TMNR)
6,741 acres—established 1975 as Society Hall Nature Reserve
Larry Santos, Park Director

Victoria Peak Natural Monument (VPNM)
4,487 acres—established 1998
Nicascio Coc, Park Director

Funding of Protected Areas

Funding the Belize Audubon Society

How is BAS Funded?

The majority of the Society's operations are grant funded, with an average of 11 different donors contributing per year. It is important that BAS maintains this wide variety of funders and partners in order to ensure that the Society is not too dependant on a single donor.

Of course, different funders finance a variety of projects with varying budgets with a variety of stipulations for implementation. It is important to note that project management is required whether the funding is small or large. Therefore, larger projects are less difficult to administer, so BAS aims at acquiring medium to large grants. The loss of the Government subvention of \$200,000 per year has caused a significant funding gap for BAS which has required significant effort to replace.

All grant funds are restricted, which means that they can only be used for the purpose stated in the grant agreement. This is usually based on the objectives of the project to carry out specific activities, and rarely provides for day-to-day operations of the protected areas managed. BAS is challenged with recurrent expenditures for protected areas management and so there is dire need to be able to generate the funds for administration. BAS actively seeks those projects that provide for administrative costs as that is essential for covering expenses of staff salaries and operating overheads.

It is conventional wisdom that NGOs should aim at reducing their dependence on funders and try to increase their sustainability by generating more funds themselves, through entrance fees, sales etc. BAS has done quite well at this. The proportion of grant funding has been reduced from 83% in 2002 to 53% in 2005. Over the same period, revenues from entrance fees have increased from 8% in 2002 to 39% in 2005.

BAS also been able to generate other revenues from accommodations at Cockscomb and equipment rental at several parks. Identifying other income generation revenue streams is critical and BAS aims at doing so in its new strategic and financial planning that it will undertake shortly. The strategic focus is to increase financial sustainability by being more efficient operationally but also by implementing other income generation activities



Although BAS receives fees from membership, they equate to less than 1% of the total income, and do not actually cover the cost of serving the membership. But BAS is a membership society, with the membership playing a key role, so the membership is not considered a revenue generator. In fact, BAS has undertaken several activities, such as bird-watching trips, to involve the members more. To make them cost effective, participants are asked to contribute to partially defray the costs of these activities to the Society. These activities have been successful and BAS aims to engage members more.

A popular means of sustainable financing for NGOs is to establish an endowment fund. This is a fund with a sizeable capital amount, where the capital is retained in perpetuity and only the interest can be spent. This ensures that the interest amount is a permanent and regular income source. BAS has a small endowment fund at the moment and is very fortunate to have been part of the Debt for Nature Swap (DNS), which is establishing a larger endowment fund for the future.

DNS – what is it?

A Debt for Nature Swap is an agreement in which developed countries and/or private organizations eliminate the debt of developing countries in return for financial support of conservation.

In 2001 a DNS was signed between the Government of Belize (GoB), the United States, and The Nature Conservancy, an NGO based in the U.S. In return for reducing the GoB's national debt to the U.S. by approximately one half, the GoB protected approximately 23,000 acres, and committed to establishing endowments for four Belizean environmental NGOs to fund environmental protection. BAS was one of these NGOs.

By 2011 BAS will have an endowment fund that should generate about \$180,000 in

(cont'd next page)





BAS has a number of challenges on the road to self sustainability as we need determine how much we really need, and then to raise that money. ... We are focusing our efforts within the next decade to move towards a Society that is self sustainable, managing at full strength with steady and secure income streams.

Funding of Protected Areas

Funding the Belize Audubon Society (cont'd)

interest for BAS to use each year towards funding its protected areas management responsibilities.

Also from the DNS, BAS receives a standard contribution each year until 2011, which is committed to direct management expenses of the Cayo protected areas.

How much is enough?

With an annual budget of approximately two million dollars, consisting primarily of restricted funds, it is easy for people to think that BAS has enough financial resources. However, the key is to think what BAS has to do with this money.

BAS manages nine protected areas. Each of these protected areas requires separate management: someone to coordinate the operations, wardens to patrol, equipment and a place for the wardens to work and, if necessary, stay. It is a massive task to control the illegal activities occurring in the protected areas. The protected areas that cater for visitors also have to staff and maintain visitor facilities: visitor center, displays, toilets, and trails. Especially in the jungle, buildings and trails degrade very quickly. And there are many other things to do, such as, environmental education in the parks and special events.

BAS has recently changed its financial system so as to be able to capture the real costs of protected areas management. While BAS is aware that a lot needs to be done, it is safe to say that we can do with more human and financial resources. The recent Business Plan Initiative looked at St Herman's Blue Hole National Park, and the authors contend that BAS needs to spend \$56,583 each year beyond current expenditures to get the park management to mission critical level, and an additional \$96,387



to reach optimal level. SHBHN is 575 acres, and BAS currently employees 6 people to operate it. The Business Plan suggested mission critical was 8 people, and optimal was 10. Compare this to Cockscomb Basin Wildlife Sanctuary, with an area of over 128,000 acres and 11 employees. Or even Half Moon Caye and Blue Hole Natural Monuments, a 50-mile boat ride from Belize City, and limited funds for gas. It is clear that BAS needs to generate more revenues to operate at a level that meets all management requirements.

The Business Plan Initiative has provided a framework for BAS to examine all the areas it manages, in order to work out how much BAS actually requires in order to manage to both mission critical and optimal levels. This will then provide a real—no doubt highly challenging—target for our fund-raising work.

So BAS has a number of challenges on the road to self sustainability as we need determine how much we really need, and then to raise that money. In generating revenues BAS needs to identify a variety of financial mechanisms, and where possible, generate the funds so as not to be dependent on others. This is a monumental challenge but we believe that we can increase our revenue streams so that we will depend on external sources as little as possible. We are also very open to ideas, and members are welcome to make suggestions on ways to generate revenues and raise funds. We are focusing our efforts within the next decade to move towards a Society that is self sustainable, managing at full strength with steady and secure income streams.

Anna Rossington, Second Secretary
Anna D. Hoare, Executive Director

Funding of Protected Areas

The BAS Finance Committee

The BAS Board established the Finance Committee to make recommendations to the Board concerning financial and funding issues.

The Committee consists of BAS Directors and Staff with financial experience, including the BAS Executive Director and Financial Manager, and is chaired by the Treasurer of the Board.

The primary purpose of the Committee is to provide assistance to the Board in fulfilling its oversight responsibility to members of the Belize Audubon Society, relating to:

- the financial condition of the Society;
- funding—gaps and opportunities;
- maximizing income through prudent investment;
- the quality and integrity of the financial statements of the Society;
- the Society's compliance with legal and regulatory requirements;
- the independent auditors' qualifications, independence and performance.

The Committee's role is one of oversight—it does not play an active role in the day-to-day operation or management of the Society.

Current Activities

Apart from reviewing proposed contracts, project budgets and financial reports, the Finance Committee is in the process of completing a comprehensive review of the BAS Finance Manual. This Manual is a "how to" for all financial transactions in the Society—setting policies and procedures to which all staff and relevant Board members must adhere.

The Committee has assisted the Financial Department to update the Chart of Accounts as recommended in the last audit.

Whilst members will not normally be aware of the Committee's work, they can rest assured that the Committee is working hard to protect the financial integrity of the Society.

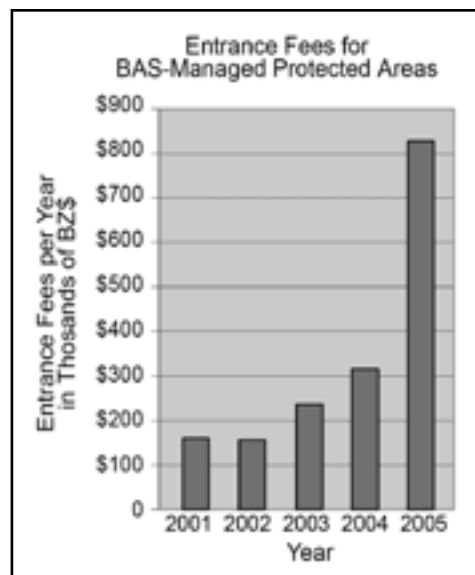
Anna Rossington
Second Secretary

Park Entrance Fees: A Slow Start



From its inception in 1969, the BAS has been managing protected areas. In the beginning that amounted to a group of volunteers going to Half Moon Caye with rat poison to decrease the large numbers of rats that were invading the booby nests and eating the baby birds.

In 1984 the Government of Belize (GoB) asked BAS to manage protected areas declared in Belize. BAS was authorized to draw up management plans for GoB approval and to implement those plans, including the appointment of wardens, but BAS was specifically prohibited from collecting any fees, although donations could be accepted and payment for services such as rental of facilities was allowed.



A proposal was submitted to the GOB in late 1992 that entrance fees be collected to support the management of protected areas in Belize.

On May 20, 1995, Statutory Instrument #52 of 1995 was signed that provided for the collection of entrance fees for protected areas in Belize for the first time. In April of 2005, a new fee structure was implemented for marine protected areas that resulted in an increase in fees for Half Moon Caye and Blue Hole Natural Monuments.

The chart above shows the increase in entrance fees in recent years. The good news is that the entrance fees collected in the BAS-managed protected areas have increased from 19% of BAS' total budget in 2004 to 39% in 2005. There are still serious short-falls, but after a slow start entrance fees are now making a real contribution to the management of protected areas.





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Funding of Protected Areas

Forest Department Strategic Plan

Government of Belize, Ministry of Natural Resources, Local Government and the Environment Forest Department Strategic Plan 2005 – 2010 (June, 2005). The following are excerpts from Section 5, "Finance and Funding"

Funding for the Department has been limited after the departure of USAID and British aid in the late 1990's. With almost 69.1% forest cover, and 38% of its terrestrial realm and 7% of the marine realm of Belize's national territory under protection, Belize now finds itself in a difficult situation to continue to sustainably manage its forests and accompanying natural resources. The forest sector in Belize is facing serious challenges in continuing its conservation efforts in an international and national economic environment that finds it increasingly difficult to raise the required funding to adequately manage its natural resources. Funding from taxes and concession fees have also experienced a downward trend since the timber resources are being over-harvested and reduced at an accelerating rate. This new reality since the mid 1990's has caused the Forest Department (FD) to face financial and human resource cutbacks.

In 2004-2005 this has been exacerbated by the austerity measures being implemented by the GOB. In order to adapt to the current situation, the FD is seeking ways to move in a strategic manner and continue to serve the Belizean people with those goods and services that the forest provides. Up to the mid 1990s the focus of the FD was almost exclusively on the exploitation of the timber resources. For the decade following the mid 90s the pressures from the global environmental and economic realities required the FD to revisit and expand its focus. Consequently the Department has now expanded its strategic focus to include biodiversity conservation and management, in addition to sustainable forest management. Greater attention is now given to national parks and protected areas, and wildlife. This expanded focus is supported by Belize's commitment to various international conventions such as the Convention on Biological Diversity and RAMSAR.

Royalties are the main source of income to the GOB from the forest sector. ... Currently there is approximately \$150,000 in royalty arrears that the FD needs to collect. Furthermore, as the importance of timber as a key income generation source has dete-



riorated, so has the capacity of the FD staff at the range level in the areas of monitoring and control of the extraction and harvesting of the timber resource also deteriorated.

However in the recent past there has been an increased level of interest at the range level to seek other methods to increase revenue collection such as charging for camping permits, research permits, provisional game licenses etc. On the positive side, however, 2004 has been a good year for the FD since the Protected Areas Conservation Trust (PACT), a direct product of the NARMAP Project, has made a substantial institutional strengthening grant to the Department. Other sources of funding, such as the Debt for Nature Swaps that began in Belize in 2001, are not available to the FD but only to the larger NGOs. Seen on the positive side, the funds that PACT would have made available to these large NGOs can now be accessed by the FD. Currently royalties from timber is approximately 50% of the budget assigned to it by the Ministry of Finance. Within the next 3-5 years, the FD expects to receive 30% of its revenue from timber royalties and the remaining 70% from other sources that would be strategically developed during this same period.

Even though the collection of royalties from non-timber forest products (NTFPs) has been insignificant in the past, there were no available records to review and assess its contributions to the financing of FD. There is a new interest by the range staff to collect revenues from this resource extraction activity; e.g., xaté, collection fees, and others. The decline of timber can be offset to some extent by an expansion in services and attendant fees that would be charged. Specific examples of services by the FD include: forest permits/licenses, information, recreation opportunities, training, protection, nurseries, extension services, research support, library, handling of wildlife, protected areas management, Clearing House Mechanism, and forest management.

Funding of Protected Areas

Protected Areas Conservation Trust (PACT) Strategic Plan (2005-2010)

One of the most important mechanisms for funding of protected areas management in Belize is the Protected Areas Conservation Trust (PACT). To ascertain the plans PACT has for the future, we consulted their current Strategic Plan (2005-2010). Here are some relevant excerpts:

PACT was established in 1996 out of the need for a coordinating force that could help in the nation-wide effort to maximize the conservation, preservation, enhancement and management of Belize's natural and cultural resources.

[For the 2005-2010 Strategic Plan, ten objectives were established, management of protected areas being the seventh.]

FUNDING OBJECTIVES

Objective 1: Increase and Stabilize Funding Resource

1.1 Increase funds available for the grant program area by a minimum of 20 percent per year thus doubling funds for the grant program area during plan period (from approximately \$2m to \$4m)

1.2 Strengthen PACT's financial management capacities to accommodate increased funding levels

LEVERAGE OBJECTIVES

Objective 2: Establish a Strategic Context

2.1 Facilitate the development and establishment of a national system of plans, policies, and priorities, at all levels, for conservation, preservation, enhancement and management of Belize's natural resources and protected areas

2.2 Establish PACT as a central broker for project funding for protected areas in Belize.

Objective 3: Facilitate Collaboration and Coordination among Stakeholders and International Organizations

3.1 Facilitate broad cooperation and coordination among national, regional, and local stakeholders involved in conservation, preservation, enhancement, and management of natural resources and protected areas.

3.2 Build linkages with bilateral and international organizations

Objective 4: Promote Awareness and Education

4.1 Establish the conservation, preservation, enhancement and management of natural resources and protected areas as one of the major priorities of Belizeans and their government

4.2 Develop tools for citizen action

Objective 5: Build Capacity for Conservation

5.1 Equip governments, non-government organizations, communities, businesses, and individuals with the knowledge and skills ... for conservation, preservation, enhancement and management of Belize's natural resources and protected areas

5.2 Enable education and training opportunities to increase availability of educated and trained Belizeans for scientific, educational, managerial, and entrepreneurial roles in Belize's conservation sector

Objective 6: Support Research and Information Sharing

6.1 Establish an effective knowledge and information base for managing Belize's natural resources and protected areas in collaboration with government, non-government and private organizations, provide funding for research for ecosystem, habitat, and species management

While scientific knowledge is essential, traditional ecological knowledge is equally essential for sustainable use and management of resources. Traditional communities in Belize have learned about resources, their uses, and vulnerabilities from centuries of experience in

"The general functions of the Trust shall be to encourage and promote, for the benefit and enjoyment of the present and future generations of the people of Belize, the provision, protection, conservation and enhancement of the natural and cultural resources of Belize." —*Protected Areas Conservation Trust Act, No. 15 of 1995 (passed January, 1996)*



PACT MISSION

The Protected Areas Conservation Trust (PACT) is an environmental trust fund serving an enabling and empowering role in the conservation, preservation, enhancement, and management of Belize's natural resources and protected areas. Through a strategic, clear, equitable, flexible, and transparent process of grant making for projects, PACT supports the involvement of large and small organizations to implement programmes and projects which enhance the quality of life for Belizeans and Belize's role as a world leader in environmental conservation while supporting national developmental goals.





PACT Strategic Plan (cont'd)

living with and using these resources. As 'modernization' spreads, this knowledge tends to get lost. PACT needs to work to preserve this knowledge as a heritage for future generations.

6.2 Promote the strengthening of information systems for full access and availability to all stakeholders of scientific and management information, documents, manuals, and publications in libraries and online.

OPERATIONAL OBJECTIVES

Objective 7: Promote Conservation Activities

7.1 Support management of natural resources and protected areas

The trench work of conservation is the hands-on activities of people who work on the land or sea doing such work as restoring habitats, preserving archaeological resources, and controlling access to protected areas. This work is normally a function of government agencies, which have legislated responsibility for resource management. However, in the context of limited government funding, volunteers, non-government organizations, and communities will do much of this work. In Belize's democratized and civic society, strong community and non-government participation is a commendable quality. To serve as an enabling agent, PACT can provide some of the funding to initiate and sustain resource management where government funds are not available and needs are great. Funding should also be made available for salaries.

Strategies and Activities

1. In cooperation with government, non-government, and community organizations, conduct needs assessments to determine resource and protected areas management needs
2. In cooperation with government, non-government, and community organizations, support and assist resource and protected areas management. Options:
 - Resource analyses and inventories
 - Resource and spatial planning
 - Physical infrastructure necessary to support intensified management developed (e.g., boats, labs, equipment)
 - Impact assessments of activities affecting protected areas

- \$**
- Surveillance, monitoring and enforcement
 - Habitat mitigation and restoration activities
 - Defensive measures to protect sensitive resources and protected areas (e.g., access restrictions, signage, fencing, defensive landscaping, special trails, gates)
 - Control of invasive alien species, pests, and domestic animals
 - Other activities that achieve objectives

Objective 8: Facilitate Community and Livelihood Development

Facilitate community and livelihood development that promotes conservation, preservation, enhancement and management of Belize's natural resources and protected areas

GOVERNANCE AND MANAGEMENT OBJECTIVES

Objective 9: Improve Grant Processes

9.1 Conduct process re-engineering of grants process: To analyze issues associated with the grant making process and re-engineer to further improve the process to ensure an efficient, effective and responsive process

9.2 Implement proactive project funding: To implement proactive strategies and priorities to guide project funding.

9.3 Continue responsive project funding for stakeholder-identified projects.

- Allocate a majority of project funding to fund proposals from stakeholders.
- Continue sponsor outreach and extension programs to assist smaller and less experienced applicants.
- Develop a more diversified set of project funding criteria for various sizes and durations of projects.

Objective 10: Improve Governance and Management

10.1 Improve the efficiency, effectiveness, and responsiveness of organizational structures of PACT

Funding of Protected Areas

Protected Areas Conservation Trust Act, Chapter 218, Revised Edition 2003

Activities to be funded by the Trust Fund, Part VI, Section 35, SCHEDULE [Sections 16 (2) (a), 35 (3) and 37]

Activities which qualify for Trust funding

1. Protected Area Management and Conservation:

- (a) determining and demarcating the limits of protected areas;
- (b) completing further ecological assessments and scientific investigation in protected areas;
- (c) implementation and improvement of management plans for protected areas that provide for sustainable use of their resources;
- (d) monitoring and surveillance activities that ensure compliance to management plans that have been developed and are being implemented in protected areas;
- (e) institutional strengthening for the management of protected areas via training to management and technical personnel;
- (f) protected area visitor use surveys;
- (g) protection of wildlife species specified in the Convention on International Trade on Endangered Species (CITES) list adhered to by the Government.

2. Protected Areas Promotion and Development:

- (a) visitor expenditure and opinion surveys on protected areas;
- (b) establishment of visitor centers and other recreational facilities;
- (c) development of infrastructure for the provision of quality services;
- (d) assistance in marketing activities that foster sustainability of protected areas.

3. Environmental Education and Awareness:

- (a) conferences and workshops in country aimed at informing the public on the state of the environment, the importance of natural resources and generating public awareness on the need to protect and preserve the natural resources of Belize;
- (b) television and radio programs aimed at generating public awareness on the need to protect and preserve the natural resources of Belize;
- (c) posters, leaflets and newsletters aimed at generating public awareness on the need to protect and preserve the natural resources;

(d) other media that inform the public, businesses, schools on the importance on the environment and the need to protect and preserve it.

4. Community Development around Protected Areas:

- (a) technical assistance to communities involved in the management of protected areas;
- (b) support community driven projects which complement the Trust's objectives and mission;
- (c) support community activities that enable sustainable development and use of natural resources in protected areas;
- (d) training programs for communities for skills in protected areas management;
- (e) organizational development of non-governmental organizations involved in protected areas management and conservation via technical assistance;
- (f) minimal infrastructure and capital equipment for non-governmental organizations involved in protected areas management and conservation.

Activities in general outside of the grant program which qualify for Trust funding:

- (a) Financial and legal advice to the Trust Board in investment of Trust Funds.
- (b) Evaluation of projects funded by the trust and trust operations.
- (c) Scholarship assistance in fields of study that complement the Trust's mission.
- (d) Technical assistance in all relevant areas above.

Activities which are not eligible for Trust funding include:

- 1. Salaries for established staff of Government of Belize agencies.
- 2. Core or permanent staff of non-governmental organizations.
- 3. Recurrent expenses of Government of Belize agencies and non-governmental organizations.
- 4. Funding for private organizations which are organized for profit.

PACT Strategic Plan (cont'd)

10.2 *Develop and maintain staff* To develop and maintain a highly motivated and capable staff

10.3 *Develop the PACT Foundation* To develop the PACT foundation into a strong force for conservation funding

Based on these goals, the recommendation is made to streamline the membership and functions of the governance structure of PACT whereby the Advisory Council is dissolved and technical committees of the Board are introduced.

[The eleven members of the Board include representatives from each of the Ministries of Natural Resources, Tourism, and Fisheries; one representative of Belize Tourism In-

dustry Association; one representative from either the Belize Chamber of Commerce or the Belize Business Bureau on a rotation basis; one representative from either the Association of Protected Areas Management Organizations or Belize Association of Conservation NGOs on a rotation basis, two non-government representatives with expertise in financial management, investment, asset management; two non-government representatives with experience in project/natural resources/conservation management or resource mobilization techniques; the Financial Secretary or his nominee who shall be an ex-officio member with the right to vote; the Executive Director of the Trust who shall be an ex-officio member without voting power.]





Payment for Ecosystem Services

Ecosystem services are those fundamental life-supporting services—seemingly infinite and free—that we take for granted, such as, purifying air to breathe, purifying water to drink, and providing fertile soil to produce the food we eat. We are even less aware of the other services that ecosystems provide: pollination, dispersal of seeds, climate stabilization, flood protection, erosion prevention, decomposition, detoxification, maintenance of biodiversity, control of agricultural pests, and carbon sequestration, to name a few.

Human activity inevitably leads to disruption of ecosystem services. The growth in population and increasing per capita consumption exacerbates the problem, as does the predominant focus on short-term gains at the expense of long-term needs. Destruction of wetlands, deforestation, soil erosion, industrial pollution of air and water, agricultural runoff of pesticides and fertilizers, sewage and animal waste, over-harvesting of fish, and introduction of exotic species are only a few of the disruptions to ecosystem services.

One reason for declaring and managing protected areas is to conserve ecosystems so they can provide these services. For example, the Crooked Tree Wildlife Sanctuary protects a major wetland system in the middle of Belize that is a reservoir for water for flood control (*see article on p. 14*). Suppose a development project filled those wetlands, where would all that water go? Then, what would it cost to build the reservoirs needed to contain the water to keep it from flooding the rest of the country?

Our economic system is based upon exploitation of natural resources for human consumption with total disregard for the true costs—the disruption of natural ecosystem services. Using an economic model to describe our natural systems, we might consider such God-given gifts as air and water as “products,” the processes that replenish and purify them as “services,” and the system that provides these as “natural capital”. This model can be useful in quantifying the costs of environmental destruction in terms that our policy-makers can understand—dollar amounts! But without some means of assessing the value



of those services, they cannot not be included in our economic calculations. To make our life on this planet sustainable, we must become conscious of ecosystem services and factor them into every decision.

There are different economic approaches in regard to payment for ecosystem services.

1) Environmental Economists attempt to incorporate payment for ecosystem services into the current economic systems. They regard ecosystem services as “externalities”, or production costs for which someone else other than the producer pays. For example, pure air to breathe is the common property of all humans and other animals. A company that pollutes the air and makes a profit without paying the cost of cleaning the air is stealing that part of the profit from the people and animals that suffer from the air pollution. Environmental Economists say that if these costs were paid and passed on to the consumer, environmental degradation would be greatly decreased.

2) Ecological Economists maintain that there needs to be a fundamental change in the basic assumptions and economic models so that ecosystem services are incorporated as “internalities.” Ecological Economists regard natural resources, living systems and ecosystem services as natural capital. Our current capitalist economic system uses up this natural capital and calls it income for the producer without assigning any value for the deterioration of the soil, air and water.

These two approaches are not mutually exclusive. Insofar as it is possible to assign dollar amounts to ecosystem services and bring them into the current economic system, it would be an improvement over the past complete disregard of ecosystem services. However, dollar amounts can never express the entire cost of environmental destruction. How does one put a value an endangered species? Our air and water are truly priceless—without them we cannot exist.

Valuation Methods

One way to determine dollar values is by a person’s willingness to pay, how much money is one willing to pay to obtain goods or services or to avoid damage. What is actually paid in market prices, the

Funding of Protected Areas

Payment for Ecosystem Services (cont'd)

prices of ecosystem products such as fish or wood that are traded in markets, can be calculated directly.

Willingness to pay can also be measured indirectly by the cost of actions people are willing to take. For example, the cost of travel and travel time to a recreation site is a measure of the value of that recreation site. It is possible to conduct surveys to ask individuals or groups what they are willing to pay given a hypothetical scenario. A dollar value can be assigned indirectly by asking people to make trade-offs among scenarios involving different ecosystem services or developmental projects.

Dollar-based value systems are limited because not all ecosystem service characteristics can be expressed in dollar values. There are no substitutes for air, water and soil—we are wholly dependent on their healthy functioning. These methods estimate the value of ecosystems from the human point of view. The intrinsic, innate value of each component of an ecosystem that has no relationship to human needs and activities is completely neglected and cannot be given a dollar value. For example, endangered species cannot be saved on economic grounds.

Developing methods for the valuation of ecosystem services is merely one step toward a basic change in our economic systems that incorporates the ecological sustainability of human activities, along with an equitable global distribution of resources between humans and nature, between humans in current time, and between this generation and future generations.

New York City's Water Supply

Several years ago New York City was faced with deteriorating water quality because the natural ecological water system was being overwhelmed with sewage and agricultural runoff. Natural hardwood and evergreen forests filter the water and hold the soil from

erosion. But when the land is cleared for agriculture or human habitation, those ecosystem services are destroyed and pollution is generated. The city administration investigated the cost of replacing this natural system with an artificial filtration plant. The large estimated cost of \$ 6 - 8 billion with an annual operating cost of \$300 million made them take a look at the natural alternatives.

In contrast, the cost of restoring the integrity of nature's purification services was \$1 - 1.5 million. They floated an "environmental bond issue" and used the money to purchase land, to compensate property owners for development restrictions on their land, and to subsidize the improvement of septic systems. Clearly, restoration and preservation of the watershed was the best economic option in this case.

Belize Protected Areas

Ecosystem services provided by Belize's protected areas include the protection of watersheds for the maintenance of pure water in our rivers, flood control, forests generating oxygen for us to breathe, forests trapping carbon dioxide for climate stabilization and many others.

The Protected Areas Conservation Trust (PACT)—funded by a tax paid by tourists who come to Belize—is a form of payment for ecosystem services. In this case the tourists value Belize's natural resources and pay this tax for their protection. PACT funds are then used to cover some of the cost of management of Belize's protected areas.

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NEWSLETTER
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Flood Assessment of the Crooked Tree Wildlife Sanctuary (CTWS)



Beginning in late June, 2006, the Belize and northern districts experienced steady, unremitting rainfall which, by early July, had the local effect of causing the Crooked Tree Wildlife Sanctuary's lagoons to overflow their banks. Shortly thereafter, the rising water completely inundated the causeway into CTWS, isolating Crooked Tree village and also preventing visitor access to the Wildlife Sanctuary.

Objective

BAS has been involved in stewardship of the Crooked Tree Wildlife Sanctuary through a co-management agreement with the Government of Belize, signed in the 1980s. As such, it is within the BAS' purview to monitor and ensure the park's ecological and economic viability. A site visit was undertaken on August 11, 2006 to rapidly assess the flooding within the CTWS.

Methodology

The site inspection team consisted of Belize Audubon Society's Research Coordinator (Ms. Ivis Chan), the Co-Management Protected Areas Manager (Mr. Allen Genus), and the CTWS Park Director (Mr. Donald Tillett). Various lagoon systems within the CTWS were visited by boat, including the Northern and Western Lagoons, and Spanish Creek. The archeological site Chau Hiix was also visited.

Data on physical conditions were collected and photographs were taken to document the extent of flooding and assess the impact. General observations were made on the state and well-being of the Crooked Tree Village community.

As the lagoons' bathymetries (and the topography of surrounding land areas) are directly related to the volume of water the lagoons can absorb, depth readings were taken at different sites in the lagoons visited. These seven depth readings were geo-referenced by use of a handheld Global Positioning System (GPS) receiver. Readings were not taken in Black Creek because the entrance/junction was blocked by vegetation.

The rudimentary but practical method used to take these readings consisted of dropping a rock, tied to a string, to the bottom of the water, and measuring the string to estimate depth. The results of this assessment are presented in Table 1 and Figure 2.

Table 1. Estimated Lagoon Depths

Site	GPS Location of Sites		Description	Water depth (m)
	Easting	Northing		
Site 1	338000	1965810	Water level gauge; north of causeway	3.88
Site 2	336775	1959075	Beginning of Spanish Creek	3.80
Site 3	336501	1957642	Junction of Spanish Creek and Southern Lagoon	4.70
Site 4	334969	1957511	Junction of Spanish Creek and Western Lagoon	4.01
Site 5	337764	1966618	Crooked Tree Pan	4.82
Site 6	337232	1970357	Alexander Pan	3.57
Site 7	336948	1970996	Bight Pan	3.86

CTWS Flood (cont'd)

Complementary to the bathymetric data collected is data on the Crooked Tree (Northern) Lagoon's water level, which is measured regularly at a gauge station north of the causeway. Historical data was obtained from the CTWS park wardens and from the National Meteorological Service.

Results

Atmospheric conditions at the time of the site visit were sunny, and flood waters were already subsiding. This subsidence was directly observed on the water marks left on vegetation. However, the causeway into Crooked Tree village was still under water, and residents had to travel by boat to and from the village. Water reached all the way to the Visitor Center. At the junction of Spanish Creek and Western Lagoon, the boardwalk was below two feet of water.

The depths presented in Table 1 give an extremely rough indication of the bathymetric 'terrain' of the lagoon system. The Crooked Tree Pan seems to be the deepest sink within the system, and wardens confirm that it is the last area to dry during the dry season.

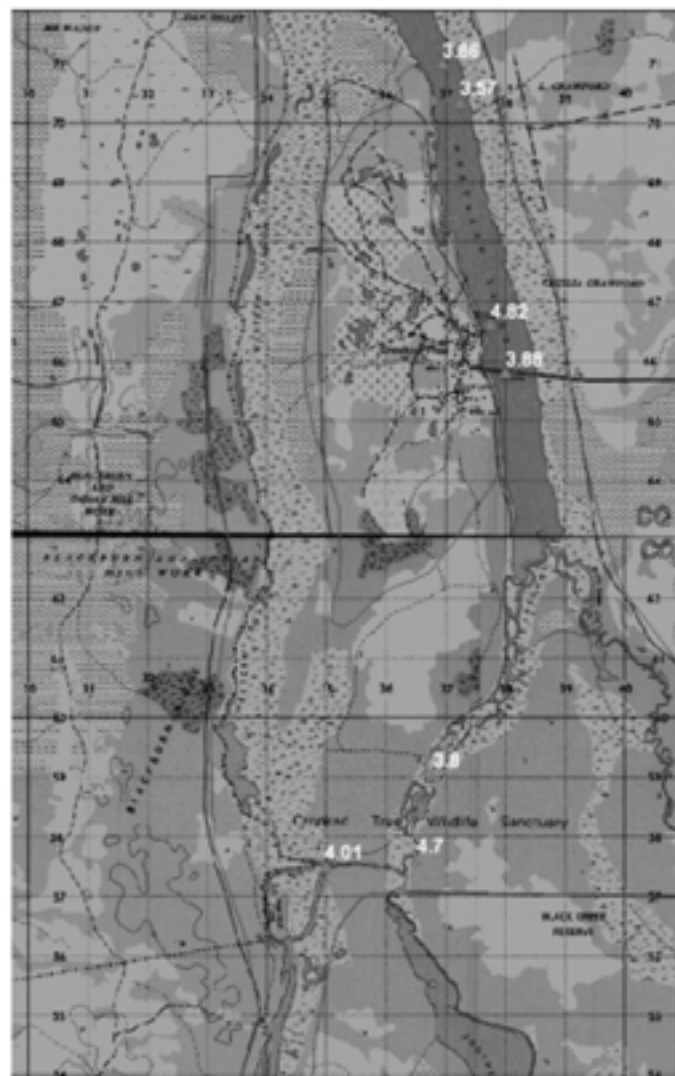
Figure 2 shows the locations of the depth data listed in Table 1 that were measured on August 11, 2006, in the Crooked Tree system. The maximum recorded water level in 2006 was 4.82 meters (above 15 feet). It is speculated that flood waters from the north (caused by heavy rains in July) drained into the system via the northern Revenge Lagoon area (D. Tillett, personal communication).

Figure 3 compares the water level at one location in the Northern Lagoon in the Crooked Tree system during the months of July and August in 2005 and 2006. According to the National Meteorological Service, 2005 was a record drought year for Belize. Very low water levels were recorded in the Crooked Tree system in 2005. Water level began to increase gradually in mid-August until late September 2005 when it peaked at 2.89 meters (9.5 feet). The maximum recorded water level at this location in 2006 was 4.05 meters (above 13 feet).

Discussion

One of the services that wetlands provide to Belize is to regulate water levels in the country. They provide a reservoir to contain floodwaters when excessive rain occurs. They also act as a settlement basin where the sediments in the water rushing from the rain can settle out and water entering the rivers is much cleaner. The contrast between a record drought in 2005 and excessive flooding in 2006 illustrates very well the natural role of wetlands.

Figure 2. Water level (m) at sample sites on August 11, 2006



Prepared by Ivis Chan, Research Coordinator, Belize Audubon Society from data provided by Belize Audubon Society, Belize Tropical Forest Studies and U.K. Directorate of Overseas Surveys



CTWS Flood (cont'd)



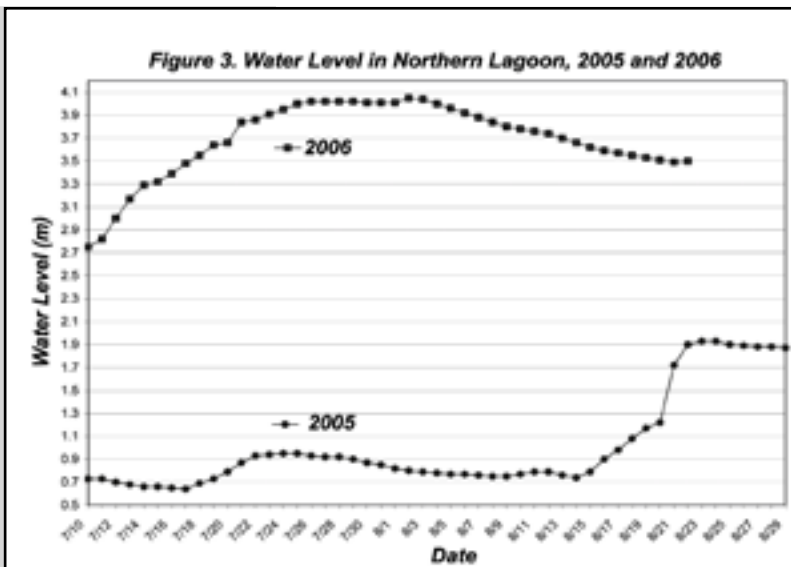
An obvious impact of the flooding on the Crooked Tree community was that villagers were unable to travel by vehicle, but instead had to travel to and from the village by boat. The Belize Defense Force stationed two soldiers at Crooked Tree and provided fuel and a boat to transport villagers, with villagers providing the soldiers with food. BAS assisted through provision of accommodations for the soldiers, as well as the use of a boat. In terms of other social impacts, one family is also reported to have been flooded out of their home at the peak of the flooding, forcing them to stay in the community center. Villagers also expressed worry over their children having to continue to leave the village by boat to go to high school once classes began.

The CTWS' lagoons should be monitored—not so much for water level, but to observe the effects of changing water level on vegetation and consequently species assemblages (e.g. birds) during flooding activity (i.e. wet) and dry season. Such observations are already carried out by wardens in some areas, and they submit species lists along with their monthly reports. Data from previous monitoring efforts could provide information for comparison.

Recommendations

From both park management and research perspectives, the flooding event at CTWS highlights a number of information gaps and consequently, priorities. Short- to medium-term recommendations include the following:

- 1) The water level at CTWS' lagoons should continue to be monitored.
- 2) Monitoring of stream flow and water quality should also be done.
- 3) Bathymetric data of the entire Crooked Tree lagoon system should be collected.
- 4) More comprehensive research efforts to examine the long-term causes and effects of the flooding within CTWS should be initiated.
- 5) The economic impact of the flooding on the Crooked Tree community should be evaluated in the short term.
- 6) Additional funding for research activities within CTWS should be sought.
- 7) Research activities should be done in complementarity with national, regional and international organizations and initiatives to monitor and evaluate overall environmental trends.



Ivis Chan
Research Coordinator
September 5, 2006

Environmental Education

Teacher's Workshop at HMCNM

On June 24th and 25th 2006, teachers from three stakeholder fishing communities, namely Chunox, Copper Bank and Sartaneja, were taken to Half Moon Caye Natural Monument (HMCNM) to learn and experience first hand the value of this area to Belize and especially to their communities' livelihood. It is expected that by exposing the teachers to this experience they will be able to enthusiastically disseminate the knowledge and experience they gained to the students in their respective communities.

The team consisting of Environmental Education Manager, Community Liaison Officer and the field staff of Half Moon Caye, planned, organized and implemented the workshop. The program was designed to engage participants in indoor and field lectures, meaningful discussions, and field exploration activities. Participants developed and delivered lessons on assigned topics for particular age groups. Topics of focus were:

- The role of the Belize Audubon Society in managing the area
- Protected Areas categories in Belize and laws governing them
- Importance of protected ecosystems in HMCNM and the roles they play in the environment;
- Importance of the fishing regulations of commercially important marine species.

As part of this program, a package was prepared for each teacher including a manual for the work shop; a resource CD with additional information and environmental education materials; posters, booklets and lesson plans were also provided. At the end of the training teachers filled out evaluation forms of the training and made post cards of the area highlighting their most appreciated view. Funding for this activity came from AVINA and OAK Foundations.

Olivia Carballo-Aviles
Education Programme Manager



Community teachers engaged in lectures and discussions at Half Moon Caye Natural Monument



In field lectures, teachers learn about the littoral forest ecosystem



Community teachers exploring the sea grass and coral reef ecosystems of Half Moon Caye Natural Monument





Concerns ranged from destruction of the environment, including possible severing of the entire peninsula during future hurricanes due to the dredged marina, to the overwhelming stress of 13,000 additional people on a tiny peninsula with a current population of 2,000.

Advocacy

Placencia Residents Oppose Ara Macao Project

Placencia
Tuesday, May 9, 2006

An eclectic mix of the people on the Placencia peninsula in Belize united last Wednesday night [May 3, 2006] to officially oppose what they fear to be destructive development in their fragile environment.

Nearly 300 people, ranging from poor Garifuna villagers to rich resort owners, from the communities of Placencia peninsula confronted the investors and developers of the Ara Macao Resort project, along with Belizean government officials, who presented themselves as being one with Ara Macao. ...

After waiting for two hours the people were informed that the meeting would take place in a tiny classroom, allowing no more than 20 of the 300 present to participate.

When all in attendance began to chant "Come outside! Come outside!" the people were asked to relocate to a different site. The crowd refused to be dispersed and the meeting took place outside the Seine Bight elementary school with everyone standing around the parked cars.

Developers and technicians on the Ara Macaw staff spent three hours presenting their project plans in technical detail, refusing to let the people talk at any point.

The development discussed included:

- Accommodations for just under 13,000 people
- 67-acre marina accommodating up to 400 boats of up to 100 feet
- dredging on the Caribbean side of 1.2 million cubic yards of fill
- two 9-hole golf courses (abutting the lagoon on the south)

- 296 villas (in 2-story buildings)
- 458 condos (in 4-story buildings)
- 260-room hotel
- 59 single family houses
- 106,250 square foot casino and night club ...

The agitated, but orderly, crowd stood listening in the dark school yard for five hours waiting for the chance to ask the developers questions.

One after another, people from various cultures and walks of life called themselves concerned citizens and took the microphone to voice their fears. The exuberant crowd cheered them on. Concerns ranged from destruction of the environment, including possible severing of the entire peninsula during future hurricanes due to the dredged marina, to the overwhelming stress of 13,000 additional people on a tiny peninsula with a current population of 2,000.

The government officials were hard pressed to stop the meeting when, at 11:00, people were still eager for their turn at the microphone. Placencia peninsula is a 15-mile long narrow peninsula with the barrier beach to the front backed by a wild lagoon. Home to various wildlife and cultures, it is one of the most unique, fragile, pristine environments in Belize.

Mr. Paul Goguen president of io-Vesp Developments, the developers of the Ara Macao, project was contacted for this article but was unavailable for interview.

Rainy Burns
Caribbean Net News Belize
(May 9, 2006)

<rainy@caribbeannetnews.com>

*BAS voted against this project at the NEAC meeting. Look for more details about BAS Advocacy work on this and other development issues in the next **BAS Newsletter**.*

Advocacy

SATIIM* Wins: Permit for Seismic Testing Quashed

On September 27th the long-awaited judgment of Judge Samuel Awich was announced that the permit issued by the Government of Belize (GoB) to U.S. Capital Energy to do seismic testing in the Sarstoon Temash National Park was unlawful because no Environmental Impact Assessment (EIA) had been done. Thus, the permit was quashed.

The EIA argument was only one of four arguments presented to the court. The other three arguments that failed were that the GoB had no authority to grant the permit, that in issuing the permit the GoB breached the co-management agreement signed with SATIIM, and that seismic testing would violate the laws governing national parks. The court did find, however, that though seismic testing might not violate the laws governing national parks, drilling for oil certainly would.

Allister King, who represents U.S. Capital Energy in Belize, indicated that the company

**Sarstoon Temash Institute for Indigenous Management. See BAS Newsletter 38:2 for a series of articles on the issue of the developing oil industry in Belize and the GoB plans for seismic testing in Sarstoon Temash National Park.*

is proceeding with the EIA and has obtained permission from the Forest Department for the experts to go into the Sarstoon Temash National Park to conduct the assessment.

Gregory Choc, Executive Director of SATIIM, said, "The challenge for SATIIM is to go back to our communities and analyze and look carefully at the Supreme Court's decision today to understand the judge's words and what they mean for the communities and the national park. I don't see today's ruling by any means to diminish the resolve of SATIIM and the communities, rather it has strengthened our confidence that we can change and transform society. We are determined to make space and create the space for us. I believe as indigenous communities, we deserve that right and I think today's ruling highlights some fundamental issues that certainly in the near future we will challenge in the Supreme Court."**

***LoveFM News, September 28, 2006*

The next issue of the BAS Newsletter will be on "Development and the Environment," so the BAS Advocacy work will be covered in detail.

Belize Supports Moratorium on Whaling

Belmopan

June 9, 2006

The Ministry of Agriculture and Fisheries hereby informs the general public that Belize's national position is in support of the moratorium on commercial fishing of whales by the International Whaling Commission (IWC). Belize is a country blessed with a wealth of natural resources and has appreciated the merits of conservation measures in ensuring the existence and sustainable utilization of flora and fauna. It is the Ministry's position that at this point in time, the current status of the great whales' populations has not been properly established and, as a result, the IWC has been unable to formulate a tangible management plan for their exploitation. Therefore, the current moratorium is justified and necessary to ensure the continued survival and existence of the great whales.



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BAS News

Tragedy Takes the Life of BAS Warden Daryll Kent Teo

In Celebration
of the life of.....



Daryll Kent Teo

Sunrise: October 8th, 1983

Sunset: July 2nd, 2006

On July 2nd, 2006, lightning struck the boat that was taking BAS Warden Daryll Kent Teo to work at Half Moon Caye. Tragically, he was killed. BAS mourns the loss and expresses condolences to his family and friends.

Birds of Belize

Red-Footed Boobies, Buff-breasted Sandpipers and More

On April I had the good fortune to observe two Buff-breasted Sandpipers in the Aguacaliente Wildlife Sanctuary and even managed to take reasonable pictures: <www.biodiversity.bz/find/specimens/profile.phtml?dcid=39989>

Jan Meerman

On 25 August 2006, at around 12:45pm whilst driving southbound on Barracks Road, immediately after the speed bump, I observed three (3) red-footed booby birds (white phase) hovering around the Princess dock near to the parking area right next to the ocean. It sparked my attention because of the way the birds were flying. Typically in that area, I observe laughing gulls, sandwich terns, royal terns and Caspian terns. When I realized they were boobies, I started to question myself about the reasons the birds are in the area.

On Monday 28th August 2006 again in that area I observed two young boys fishing and there were gulls, brown pelicans, and magnificent frigates around. What was unusual to me, was that the gulls were grabbing the chicken skin bait off their fishing line whenever the young boys would throw it out to sea. It was frightening because the hooks on the fishing line could injure the birds.

On 31 August 2006 during my hunt for Boobies, during lunch on the Marine Parade and Barracks Road, armed with my Nikon d70s SLR, I came across this whimbrel (*right*), who was very camera shy and ran far away.

Dirk Francisco



On Saturday August 26, 2006 at 3:30pm I was driving along the new Marine Parade and into Newtown Barracks/Princess Margaret Drive in Belize City. In front of Business Computer Systems (138 Newtown Barracks) and about 50 feet from the vehicle, just across the seawall, I saw a booby flying low over the sea. It seemed that the bird had just raised from the water as it was flying very slowly and trying to gradually gain altitude. It was only a few feet above the surface of the sea and roughly at eye level as I drove past in my vehicle. I made out a completely brown body including all of the upper and lower parts, and the tail. The bill was distinctly bright blue and when the bird banked gently, the red feet became apparent.

This is the adult brown phase of the red-footed booby. As I was certain of the identification, I didn't stop to observe the bird further. Other members of my family who were with me at the time also got a clear view of the bird. I had my ABA North American fieldguide (which has an excellent illustration) in the vehicle and we checked to confirm the observation. I have previously seen a red-footed booby in Belize City around the time of Hurricane Mitch in 1998. That one was an adult white phase individual (blown in by the storm) which was swimming back out to sea in the mouth

of the Haulover Creek at Fort George.

Philip Balderamos



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Thanks for Feedback!

Thanks for all your letters, email messages and comments on membership forms. Keep them coming! Here are a few...

A Pleasure and Honour

It's a pleasure and honour to be a member of the Belize Audubon Society. As a Biology major, currently enrolled in the University of Belize my main focus and concern is the country's natural resources. I would like to say that the newsletters provided by BAS greatly increase the awareness of our country's environment.

—Abihail Pech

Request from Corozal

Even though the district of Corozal may not have a protected area or wildlife sanctuary, I am of the opinion that efforts should be done to train the public on the importance of wildlife preservation especially the children in school. It is common to see kids going around with slingshots and pellet guns killing the one or two wild birds. The awareness of the need for wildlife protection is poor!

—Anonymous

Two Wildlife Sightings

Location: Tamandua II, Indian Creek Road, Mile 32 Hummingbird Highway, three miles east of St. Margaret's Village, Five Blues National Park area

- 1) On May 4, 2006, a Snail-Eating Snake (*Dipas brevifacies*) was found in leaf stem debris of felled cohune to the side of the house. According to the *Field Guide to the Snakes of Belize* (1995 Ed.), it should not be present in this area.
- 2) On March 8th, 2006, a Brown Violet-Ear (*Colibri delphinae*) was first seen at approximately 4 pm feeding from our hummingbird heeder at a distance of eight feet. The hummingbird fed continuously on the 8th and 9th until the last observation at 5 pm on the 10th of March. According to Lee Jones' book, *Birds of Belize* (2004), this hummingbird should not be here.

—Bernard Dempsey

Belize Audubon Society

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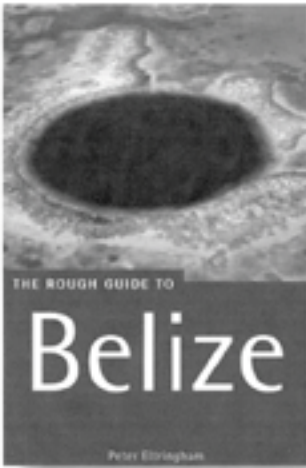
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