The campaign planning and implementation could not have been possible without a strong and hard working team:

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- Mrs. Olivia Carballo-Avilez- Education Program Manager, campaign manager
- Ms. Dominique Lizama- Crooked Tree Wildlife Sanctuary Manager, campaign support
- Mr. Rene Jones, Mr. Derrick Hendy, Mr. Steve Tillett- Crooked Tree Wildlife Sanctuary Staff, on the ground support team
- Mr. Orlando Jimenez- Community Liaison Officer (CLO) until 2008, Mr. Lucito Ayuso- CLO January 2008- present
- Mr. Dirk Francisco and Ms. Marcie Geban, campaign support

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Reviewed and edited by: Anna D. Hoare, BAS Executive Director

This report serves as documentation for Belize Audubon Society as well as to provide Rare and the National Audubon Society with a comprehensive update on the project. In addition it is a requirement in the partial fulfillment of a diploma in Conservation Education, from the University of Kent in Canterbury, England.
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I. Acknowledgements

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Last but not least we would like to thank our families for their unconditional support and help throughout this project.
II. Executive Summary

Crooked Tree Wildlife Sanctuary (CTWS) is the largest inland wetland system in Belize, designated as a Ramsar site and more recently an Important Bird Area (IBA) for the protection of approximately 300 bird species. Since the sanctuary encompasses most of the wetland area, it also protects a very important flood plain crucial in maintaining the hydrological balance of the Belize River Watershed.

To reduce unplanned and unsustainable developments that directly affect the wetlands of CTWS, a social marketing campaign was designed and implemented to first raise pride and awareness on the importance of the wetlands and to establish a practical and adoptable set of cattle farming guidelines that will guide cattle farming developments near the crooked tree wetlands.

Before implementing the social marketing campaign a Knowledge Attitude Practice (KAP) pre-campaign survey was conducted (November-December 2007) in the Rural communities surrounding Crooked Tree Wildlife Sanctuary (CTWS) namely: Biscayne, Crooked Tree, Lemonal and Gardenia with a total population of 2,353. A separate but similar pre-campaign survey was done in Belize City (population of 49,000). A total of 277 usable surveys collected from the rural communities and 248 usable surveys collected from Belize City were analyzed in SurveyPro®. With information gathered from the pre-survey, SMART objectives and activities aimed at increasing knowledge about the CTWS wetlands, shifting attitudes toward wetland especially that of “wetlands are waste lands” and changing behaviors of cattle farming practices in and around the wetlands of CTWS. The activities were designed using social marketing and behavior change approaches (Knowledge---Attitudes---Interpersonal Communication---Barrier Removal---Threat Reduction---Conservation Results. Activities included a mixture of printed materials (posters, buttons, farmers comic booklet, banner, children’s coloring book); multimedia productions (wetlands song, video, mascot, variety show and radio messages) and face to face activities (teachers’ workshops, video shows, farmers and women’s chats, farmers demonstrations, leaders visit and tour, school visits and local advisory committee meetings). Some activities were more successful than others which were dependent on the time and effort spent on gradually guiding the audience to move from one “stage” to the other. In April 2009, after the implementation of the 12 month campaign, a post KAP survey was conducted in the rural communities to measure the overall success of the campaign. Using SurveyPro® 248 usable post-campaign surveys were analyzed and compared with the 277 pre-campaign KAP surveys.

In the pre-campaign KAP survey (N=277) responses indicating knowledge of wetlands averaged 23%. In the post-campaign KAP survey (N=248) responses indicating knowledge of wetlands averaged 44%. This was an average increase in knowledge of 21 percentage points (pp) after the campaign. Responses indicating positive attitudes towards wetlands average 47% in the pre-campaign survey, while 64% in the post-campaign
survey; this indicated an increase of 17 percentage points. Both knowledge and attitudes increased slightly higher than expected, where knowledge was expected to increase (on average) by 20% and attitude by 15%.

The “practice” that was expected was that farmers would adopt and implement better cattle farming practices: ten cattle farming best practices were developed and agreed upon by the farmers. Ten out 35 full time cattle farmers signed mini contracts with BAS to implement at least 5 out of 10 best practices, in exchange of solar shocks and some grass seed that would also increase their product quality. Two out of the 10 farmers had implemented 5 practices at the end of the campaign.

Behavioral change is more difficult to achieve and is dependent on many factors beyond the campaign time frame. Enforcement of the protected areas and cattle trespassing act is essential for the further adoption and maintenance of the practices. There is still much to be done to reduce the threat of unplanned and unsustainable developments that directly affect the wetlands of CTWS. This campaign was successful in strengthening the relationship and communication between BAS and the community, increased knowledge and attitudes by 20% and 15% respectively and made a slight move towards behavior change. However without continued work and communication with the communities the CTWS will remain threatened. More of these types of initiatives are important and necessary.
Chapter 1: Site Background

1.1 Geographical Location, People and Economy

Belize is a small country in Central America of only 8,867 sq. miles (22,966 sq. kilometers), with a population of approximately only 248,000 (Central Statistic Office, 2002) 17 30’ and 18 00’ north , 88 22’ and 88 35’ west. It is bordered by Mexico to the north and Guatemala to the west and south. To the east, Belize is bordered by the Caribbean Sea.

Belize can be divided geographically into two areas- with the flat limestone Yucatan platform to the north and the steep Maya Mountains dominating the southern region. Crooked Tree Wildlife Sanctuary, the target area for this pride campaign lies on the flat lowlands to the north. More specifically Crooked Tree Wildlife Sanctuary and the surrounding communities are in Northern Belize District, one of the six administrative districts in Belize.

The targeted communities are namely Biscayne, Crooked Tree Village, Gardenia and Lemonal and one urban community, Belize City. The total human population in that target area is 51,423 (Rural=2,353, urban 49,00). (CSO, 2002) People in this area are mostly of the Creole culture. People in the Crooked Tree Village are creoles with a stronger English ancestry than African.

The income base of the rural communities in the site includes cattle farming, fishing, and seasonal production of cashew products and black berry products, subsistence hunting and more recently a shift to city-based occupations, with an increased percentage of the
population commuting daily to Belize City now that transport links make this feasible.

The Crooked Wildlife Sanctuary was established a protected area in 1984 and is approximately a 36,479 acre landscape of wetlands, savannas, lagoons and creeks (Meerman, 2005). The high wetlands value of Crooked Tree Wildlife Sanctuary is highlighted by its acceptance as a RAMSAR site in 1998 – as a wetland of international importance - recognized for providing critical habitat for both migratory and local bird species, with a shallow water system that is especially important for the wetland birds. Several threatened species are protected by this conservation area including Yellow-headed parrots (Amazona oratrix), Jaguar (Panthera onca), Puma (Puma concolor), Baird’s Tapir (Tapirus bairdii) and the Neotropical River Otter (Lontra longicaudis). Occasionally the West Indian Manatee (Trichechus manatus) spends time within the lagoon system when waters are high. Other species of concern found within the protected area include Morelets Crocodile (Crocodylus moreleti), the Central American River Turtle (Dermatemys mawii), and the Common Slider (Trichemys scripta). The Subtropical Freshwater Wetland Complex has waterways, logwood swamps and lagoons that support a wide array of flora and fauna. It is very important to migratory birds seeking seasonal shelter in Belize and some 332 species of birds (Walker 2006) have been recorded, including the Jabiru Stork, the largest flying birds in the Americas, with wingspans reaching 8 to 10 feet and one of the only two members of the Stork family in Central America.

1.2 Land Tenure

Crooked Tree Wildlife Sanctuary is national land, designated as a Wildlife Sanctuary by Statutory Instrument under the National Parks System Act (Box 1). It has had protected status since its declaration as Belize’s first Wildlife Sanctuary in 1984. Under the current legislation, there are restrictions on activities that can take place within the area. Research, educational and recreational activities are permitted, but theoretically, no extractive use (sustainable or otherwise) is currently allowed except under a permit from the minister of natural resources.

As the Crooked Tree lagoon system has been traditionally of great importance to the local communities, continued extraction of natural resources has been allowed, though this

Box 1: Statutory Instrument No. 95 of 1984

8th December, 1984

Wildlife Sanctuary Declaration (Crooked Tree) Order 1984

Firstly: Crooked Tree Lagoon Area: All that land in the Belize District comprising strips 300 feet wide measured inland from both shores or banks of Calabash Pond, Revenge Lagoon, the creek which connects Revenge Lagoon to Crooked Tree (Northern) Lagoon, Western Lagoon, Poor Hall Creek, Spanish Creek Lagoon, Southern Lagoon, and Black Creek. Also a strip 300 feet wide measured inland from the eastern shore of Crooked Tree (Northern) Lagoon; and also all the submerged lands beneath each of the said waterways: and including firstly, approximately 600 acres of land situate between Western Lagoon on the west, Crooked Tree (Northern) Lagoon on the east, an east-west line on the north, and the creek connecting Poor Hill Creek to Crooked Tree (Northern) Lagoon on the south and, secondly approximately 2,300 acres of land situate between Crooked Tree (Northern) Lagoon and Black Creek and on the south side of the junction of these two waterways, but excluding any lands leased or grants which lie within the area...
contradiction with the legislation and with the aims of the protected area has caused conflict in the past between Belize Audubon Society, the managing body, and the local community members.

1.3 Management Framework

"Belize Audubon Society has managed the Sanctuary since 1986, through a series of renewed Memoranda of Understanding between BAS and the Government of Belize (GoB). Under this agreement, first signed in 1995, amended in 1999, and more recently renewed in August, 2004, BAS is responsible for the day-to-day management and maintenance of the protected areas, whilst the Forest Department (GoB) is responsible for law enforcement.

The Department is also partially responsible for providing and maintaining access roads, boundary demarcation, signs, guard posts, and radio equipment – a responsibility shared with BAS under the most recent MoU. Development and implementation of management plans and a means of monitoring the success of implementation for the protected area are the responsibility of BAS, following approval of these plans by Forest Department. (MoU)

1.4 Lead Agency

The Belize Audubon Society (BAS) is a non-governmental membership organization dedicated to the sustainable management of Belize’s natural resources through leadership and strategic partnerships with stakeholders in order to create a balance between people and the environment. Formed in 1969 as a foreign chapter of the Florida Audubon Society, BAS became an independent organization in 1973. It has since become 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 1,200 members with a staff of more than 42.

While the name "Audubon" suggests “bird watchers”, the Society is interested in all aspects of the natural heritage and is dedicated to the preservation of the wildlife and natural resources of Belize. It aims to promote appreciation of the beauty and diversity of nature, particularly in young people, by providing environmental education. Making people aware of the value of conservation is one of the Society's prime aims and objectives.

At the request of the Government of Belize (GoB), BAS has been instrumental in the management, development and financing of protected areas that have been designated under the National Parks System Act of 1981. Currently BAS manages nine of Belize's protected areas (over 162,000
acres) with a well-trained, knowledgeable staff, with the field being mostly from the surrounding buffer communities. These protected areas include:

1. St. Herman's Blue Hole National Park
2. Cockscomb Basin Wildlife Sanctuary
3. Crooked Tree Wildlife Sanctuary (Ramsar Site)
4. Guanacaste National park
5. Halfmoon Caye Natural Monument (World Heritage Site)
6. Tapir Mountain Nature Reserve
7. Actun Tunichil Muknal Natural Monument
8. Blue Hole Natural Monument (World Heritage Site)
9. Victoria Peak Natural Monument

BAS’s advocacy and education programmes focus on protecting the integrity of these areas by analyzing and influencing policy, and educating the people who now, and in the future, will impact the parks. It works closely with the communities that surround the protected area - recognizing that their cooperation and input is essential to effective conservation.

1.5 Flagship Species
The Jabiru Stork (Jabiru mycteria) is the only member of the genus Jabiru, its name coming from the Tupi-Guarani language meaning “swollen neck”. The Jabiru is the largest bird in Belize and can grow as tall as 1.15 m and weigh as much as 8 kg. Their wingspan averages 2.6 m. The beak is upturned, black, and broad, and can extend to 30 cm. The bird’s plumage is largely white, with the skin on its head and neck being featherless and black. On the top of the head there is a silver tuft of “hair”. There is a 75 mm band of skin around the lower portion of the neck. When Jabiru is inactive, the band is a deep pink - when they are irritated, it turns a deep scarlet color. The Jabiru also has a featherless red pouch at the base of the neck.

The global population size has not been quantified, but it is believed to be large as the species is described as 'frequent' in at least parts of its range (Stotz et al. 1996). Global population trends have not been quantified, but the species is not believed to approach the thresholds for the population decline criterion of the IUCN Red List (i.e., declining more than 30% in ten years or three generations). For these reasons, the species is evaluated as Least Concern.

Though the Jabiru is not a species of concern it is a species that indicates environmental quality, protecting the habitat of this species can mean the protection of the environmental health of wetlands. The Jabiru gained protected status in Belize in 1973. Since then, there numbers in the area have slowly risen. They have been granted protected status by the U.S. Migratory Bird Act.

Male and female Jabiru Storks stay together for at least one breeding season, possibly staying together through multiple breeding seasons. (Kahl, 1973). They breed at Crooked Tree making a large nest, which is often deeper than it is wide. Nests are usually made of sticks and woody debris. The average clutch size is around 3 (range 2 to 5) eggs. Both males and females are involved in nest building, incubation, and care of the young. During incubation and the nestling stage, one parent watches over the nest while the other forages. The pairs stay in isolated breeding areas until the nestlings...
fledge. They exhibit strong territoriality near their nest and feeding areas. (Barnhill et al., 2005; Kahl, 1971)

McKenzie-Mohr and Smith in “Fostering Sustainable Behavior” write that “All persuasion begins with capturing attention. Without attention, persuasion is impossible”. Choosing the right Flagship Species can be a useful tool to convey positive messages about key habitats. The questionnaire survey described in section X, asked respondents to say which of the following animals (they were shown pictures) makes you feel most proud. The options included the Hicatee (turtle), Bay Snook (fish), Jabiru Stork or Yellow-headed Parrot. Space was left to include “other” responses. Forty-four percent of all respondents believe the Yellow headed Parrot should be the flagship species of Crooked Tree, with 23% saying the Jabiru. The figure being roughly the same for Crooked Tree. During the planning phase it was suggested that the question might have been better asked as “Which species best symbolizes the community of Crooked tree”. The campaign team decided that the Parrot has little to do with the wetlands and therefore was probably not a great campaign symbol. They choose instead the second-ranked option – the Jabiru Stork.
Chapter 2: Site Assessment

The campaign site, Crooked Tree Wildlife Sanctuary was selected specifically because, it is the most important biophysical protected area BAS manages but by experience, it is one of the most challenging protected areas to manage. This is mainly because four communities are in very close proximity to the sanctuary; one of the communities, Crooked Tree Village, actually sits in the middle of the protected area. Through everyday management of the sanctuary it was evident that there were many conflicts between people and the environment, resulting in threats to the integrity of this area. The site assessment aimed at compiling and where possible collecting, both quantitative and qualitative information to identify the various threats, prioritize on the highest threats and design a social marketing campaign that would assist in reducing one of the priority threats.

Social Marketing is the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the voluntary behavior of target audiences in order to improve their personal welfare and that of their society (Andreasen1995). Assessing the site included: One stakeholder meeting; a series of focus group meetings with farmers, teachers, village council, CTWS management agencies and agriculture related agencies; one-on-one conversations with farmers; problem tree mapping (concept model); ranking of threats by scope severity and irreversibility with assistance from scientists and rangers that work in the area; ranking for “Ability to Influence the threat” with assistance of the BAS team, and the survey of people’s Knowledge Attitudes and Practice (KAP) toward the wetland of CTWS.

The process of compiling and collecting the information took approximately 6 months. After the first three months a set of assessments were done and a plan was almost complete. This first plan focused on increasing awareness of wetlands and addressing the development of commercial fishing regulations. However during this time several occurrences changed the direction of the campaign plan: 1. there was a question of sensitivity and readiness of the community to “buy in to” the plan on regulating fishing 2. There was a question on why the native fish species was selected as the key target to address, when the hydrology of the system appeared to be a more important conservation target 3. A series of threats (unplanned and unsustainable developments, linked to land clearing and cattle farming) increased in scope, severity and irreversibility due to the building of a road across one of the major lagoons of the wetland system, thus changing the threat priority. These three reasons combined, convinced the campaign manager to reassess the direction of the campaign. The following 3 months were spent reassessing the site with hydrology and habitat of the wetlands as key targets.
2.1 Stakeholder Meeting

The stakeholder meeting took place at the Crooked Tree Government School in the Crooked Tree village and brought together 27 participants who met to identify direct and contributing factors to environmental degradation of the Crooked Tree Wildlife Sanctuary and create a Concept Model. The project’s scope (the wetland’s and rich variety of life of Crooked Tree Wildlife Sanctuary) formed the context for these discussions. Direct threats were identified, and then written on cards that were placed onto a sticky wall and linked to the appropriate target(s) using arrows. Participants then discussed the contributing factors (indirect threats) that led to, or exacerbate, the direct factors.

The result is a simple “map” Figure 1, of what is impacting the target as is the perception of the participants in the stakeholder meeting (see next page).

To make the links between the various factors and the target clearer the scope of the project was sub-divided, using Miradi software, into the following five key “targets”1: Wetland habitat native fish; Jabiru stork and other wetland birds; Hicatee; and, Terrestrial wildlife.

Each of these targets is threatened by a complex of one or more direct threats and indirectly by a number of contributing factors or indirect factors. All nine threats identified by key stakeholders at the planning meeting are the outcomes of human activities (with the possible exception of drought). These are shown in the table below together with their definition according to the IUCN definition:

The wetland ecosystem (target) of Crooked Tree Wildlife Sanctuary is negatively affected by land clearing which is thought to be principally driven by pressure to develop tourism, special interest group to access land and create new sources of income for the area. A further threat affecting wetland areas are fires which can result from land clearing as well as longer dry season periods. Solid waste disposal is also seen as a direct threat by participants as in some instances it is directly introduced in the wetland and it can leak organic and inorganic substances into the lagoon and surrounding area decreasing the site’s amenity value and increasing risks to people’s and wildlife’s health.

---

1 Notes from the October Stakeholder Meeting were used to facilitate this process
Figure 1: First Concept Model: Community Perspective

Drafted during the first stakeholders meeting
Land clearing for Cattle Farming

Lack of Income

Lack of Knowledge

Increased cattle farming in protected areas

Future developments without a plan developed in the sanctuary & these

Wildfire

Lack of a sustainable development plan

Lack of income

Training

Lack of employment opportunities

Lack of capacity for engaging income generating projects

Low numbers of tourists

Non-enforcement of regulations (NSW)

Less lands within protected area

Cattle and traditions

Unfulfilled promise by the government to ensure sustainability

Critical influence

Building of road through the weekend with out the proper process

Lack of understanding of the importance of land

Lack of interest by young generation in traditional skills to create new products (NSW)

Traditional skills are under threat by older generation (NSW)

Low level tourism marketing of site

Challenges in communication between co-managers and the community

Challenges in the Co-management process

Resistance to implementing relevant regulations by management authorities and local council

Ineffectiveness of Landcare Advisory Committee (LAC) NSW

Final concept (revised three times)
<table>
<thead>
<tr>
<th>Direct threats</th>
<th>IUCN classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>11.2 Droughts</td>
</tr>
<tr>
<td>Fire</td>
<td>7.1 Fire &amp; Fire Suppression</td>
</tr>
<tr>
<td>Land clearing</td>
<td>1.3 Tourism &amp; Recreational Areas</td>
</tr>
<tr>
<td>Agricultural run off</td>
<td>9.3 Agricultural and Forestry Effluents</td>
</tr>
<tr>
<td>Solid waste and water pollution</td>
<td>9.4 Garbage &amp; Solid Waste</td>
</tr>
<tr>
<td>Commercial net fishing</td>
<td>5.4 Fishing &amp; Harvesting Aquatic Resources</td>
</tr>
<tr>
<td>Cattle (livestock) dung</td>
<td>2.3 Livestock Farming &amp; Ranching</td>
</tr>
<tr>
<td>Hunting</td>
<td>5.1 Hunting and Collecting Terrestrial Animals</td>
</tr>
<tr>
<td>Wildlife harassment (slingshots)</td>
<td>5.1 Hunting and Collecting Terrestrial Animals</td>
</tr>
</tbody>
</table>

Table 1

Table showing a break down of the population by communities, returned survey numbers, percentage sampled and their confidence interval

<table>
<thead>
<tr>
<th>Sample area</th>
<th>Population size</th>
<th>Returned sample size (n=)</th>
<th>Percentage sampled</th>
<th>@ 95% confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belize City (Urban)</td>
<td>49,000</td>
<td>238</td>
<td>.49%</td>
<td>CI 6.34,</td>
</tr>
<tr>
<td><strong>KEY TARGET</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crooked Tree, Lemonal, Biscayne, Gardenia (rural)</td>
<td>2,353</td>
<td>277</td>
<td>11.8%</td>
<td>CI 5.53%</td>
</tr>
<tr>
<td>Crooked Tree</td>
<td>867</td>
<td>101</td>
<td>11.6%</td>
<td>CI 9.2%</td>
</tr>
</tbody>
</table>

Table 2

Table showing the list of threats identified during the stakeholder meeting

---

2 Even though drought is exacerbated by human induced-climate change, it is beyond the scope of a project like this to effectively address. This Concept Model narrative will therefore focus on the remaining principal human-induced threats facing CTWS.
2.2 Focus Group meetings

To test some of the information gleaned from the participatory meeting and to glean additional information, Olivia held six focused conversations with key stakeholder groups. Each meeting was taped and transcribed.

**Cattle Farmers:** The purpose of this focus group meeting was to gather information from the Cattle farmers regarding water pollution and jaguar predation issues. There were a total of 5 cattle farmers and two BAS representatives. The farmers were invited by Mr. Rudy Crawford former village council chairman and representative of the Cattle Grower’s Association. Free roaming cattle are a problem as they graze the lagoon during the dry season. Their dung accumulates and as the lagoon floods it provides nutrients that lead to algal blooms. Algal blooms result in O2 depletion that adversely affect native fish, while enabling invasive tilapia to thrive.

This group was initially reluctant to participate in the meeting. Cattle farmer, Kenneth Carrie noting, “I am not sure why we were called to this meeting and what we have to do with the sanctuary, how will we benefit from this?”. The facilitator explained that the Sanctuary “belonged” to everyone and explained the purpose of the meeting. Participants then settled down and became engaged. They stated that about 20 people in the Crooked Tree community were involved in cattle farming and that most complied with regulations regarding “penning” their cattle. Participants believed that there were only five farmers in the community causing problems with not penning their animals and that they themselves disagreed with the free ranging cattle. Mr. Crawford noted several occasions when he had personally appealed to farmers who did not pen their cows. He appealed both as a representative of the Cattle Farmer’s Association and as a Village Council Chairman, but his appeals fell on deaf ears. There seems to be a lack of political will to enforce the law. He noted that laws exist and call for free-roaming cattle to be rounded up and taken to the Central Farm. In one case the Minister himself intervened and ordered the cattle released. Another participant, (who was himself a policeman), indicated that his efforts had also come to nothing. On one occasion free-roaming cattle stampeded and trampled a young child who was seriously injured. In that instance he had taken his gun and shot the cow. When the owner was made aware, he was not concerned about the loss of his animal and even refused to get rid of the carcass – something the Council had to do. Mr. Crawford indicated that he had invited these 5 farmers who allowed their cattle to roam to come to this meeting, but they refused to accept the invitation.
Fishing Group Focus Meeting

Purpose: The purpose of this discussion was to gather the views, attitudes and opinions of fishermen around CTWS. There were a total of seven people in the meeting, three fishermen and two fisher women, the BAS community liaison officer, and a park warden from CTWS. The fishers were invited by Mr. Uriah Tillett one of the oldest fishermen in the area. Fishermen have traditionally been very wary of such meetings. While their impact is great their number is few.

This group was a very dynamic one as they readily shared their thoughts and opinions. They were certainly not afraid saying what they thought and they provided extensive historical information. These fishermen have been fishing in the Crooked Tree Wetlands since 1952 (in the case of Mr. Uriah) and the others have 30 years of fishing in the area. Historically, according to Mr. Uriah, there were only about 4 fishermen and the fishing methods used were: cast net, fishing with wooden spears and head lights, line fishing and fish pots. Fish was no problem to catch and according to Mr. George “we would get up early and go home back early with a full sack of fish, but right now we would spend the entire day out there to get some fish.” According to Armelia “24 years ago I would catch fish good with my line, I would go for an hour or two I come with a hand of Bay Snook! Bay Snook I am talking about!”. Today they estimate the number of commercial fishermen to be 25, from the Crooked Tree Village alone. Fishing has moved from cast netting to mainly net fishing, with nets measuring more than 30 yards. Sometimes three of four nets are put together to maximize the fish catch as Mr. Kenneth Bruce (aka-Tree) mentioned “the nets are long and sometimes we join two or three nets to get the fish cause like right now (high water) the fish is not abundant.” Other types of fish methods are line fishing and spear gun fishing.

Participants had the perception that net fishing is necessary in the Crooked Tree Lagoon because it gets dry during some parts of the year which leave fish exposed and the fish die anyway. They feel that they are contributing positively to the community because they help avoid the “stench” caused by the dead fish. They firmly believe that net fishing should not be banned in the Crooked Tree Wildlife Sanctuary. Additionally they feel that they would be able to bring in more fish if they had nets larger and better nets. (NOTE: fishing in CTWS is illegal, but the law has been difficult to enforce due to the traditional rights that the community has to fish, the traditional methods have been, line fishing, fish pot or cast fishing. Net fishing is not considered a ‘traditional method’. Even though on-going discussion with the communities have made attempts to regulate the fishing activity, BAS, Forest and Fisheries department have no formalized the agreement due to lack of enough baseline data to make adequate decisions.)
The fisher men do not seem to be very selective with the types of fish they obtain. Nevertheless they see Bay Snook and Tarpon as the “gold” of CTWS. One fisher man, Uriah Tillett, the oldest fisher man in the group prefers Tilapia mainly because he sells fish filleted. The lack of proper regulation of commercial fishing by non-residents, was identified in the stakeholder meeting, and extends to the lack of proper regulation of commercial fishing by residents as well. According to the fishermen the rule is that the chairman is the person that decides when the lagoon should be open for net fishing. When the lagoon is open for fishing they pay $50.00 per net haul whether they get fish or not. They argue that the fee was once $25.00 for hauling net 3 times a week. Furthermore, they added that they know they should not fish 1 mile north and one mile south in-front of the village but still do so because non-residents are given preferences to fish if they pay the required fee. In a subsequent meeting with the co-managers including BAS, Forest Department and Fisheries it was said that they have a verbal agreement with the community to regulate commercial fishing but none of them were aware that the village council was charging a fee of $50.00 per net haul and that preference was being given to people from outside the community to fish if they paid their fee.

In regards to commercial fishing by non-residents, the fisher men at the meeting argued that one person, in particular, is conducting mass commercial fishing. According to a fisherman, Kenneth Bruce: “People like Albert have nets that can conquer about 6 ft of water and his net conquer all the underneath so he take everything and when it does open we can only get a couple hundred pounds”. They all agreed that he should not be fishing in this area because he is no longer a resident of Crooked Tree Village, even though he was born and raised in the village.

**Focus Group Meeting: Tourism Issues,**

During the stakeholder meeting of October 7th 2007, stakeholders strongly insisted that low tourism was both a direct and indirect factor that influenced CTWS and also linked it to poor communication with the management agency, BAS. This meeting was attended by 11 individuals, three of which were hotel owners, three tour guides, one cook, and two hotel secretaries. Also invited was one warden from the Crooked Tree Wildlife Sanctuary and the Community Liaison officer of (BAS), who acted as co-facilitator. The guests were invited by Mr. Sam Tillett, a hotel owner of the community.

This group seems to appreciate the importance of the protected area and they see the direct benefits, mainly from tourism. Nevertheless they felt that tourism in the last three years has decreased drastically from previous years, a factor that they attribute to low marketing on the part of the Belize Tourism Board (BTB) and the Belize Audubon Society, as well as
competition of different touristic destinations in the country. As Mr. Sam Tillett stated: “I used to get quite some tourists from the Belize Audubon Society office and they use to call me up.

For these past two years I have gotten no one! I would like to see BAS ‘sell’ (market) the village and give options to the tourist in terms of hotels and tours.” Other people like Ms. Verna, Roxanne Berry and Denvour brought up points concerning the marketing done by BTB focusing mainly on coastal and marine destinations.

They feel that the present tourism activity is not being profitable enough to sustain the community as it is seasonal and of low numbers, therefore in their opinion it is presently not a viable alternative livelihood activity. They estimate the high season to be three months of the year, after which they have to find other sources of income and even need to release their workers -- “it is very difficult to keep your staff in those times and many times you would have a good set of works but you can’t keep them and during low season you don’t have a job to offer them and they have to keep living.”

In terms of management, they feel BAS is doing a “poor job” referring to several minor points such as signs, management of staff schedule, maintenance of trail and communication with the local community. As Ms. Verna stated “I think that the guys posted at the sanctuary could improve communication with us, whenever there are going to have any meeting or activity, they should be a little bit more efficient in getting the information to the people.”

From their experience with tourists they think tourist are satisfied with their experience as they have received comments on the abundance of wetland and forest birds, on the rich culture of people and the beauty of the wetlands. They however expressed, that there are factors like the large amounts of garbage, the presence of free ranging animals and road infrastructures that tourists view as turn offs to visiting CTWS. The garbage issue they attribute to the lack of a garbage collection process. Most people burn their garbage and others leave their garbage wherever. According the Mr. Jimenez, BAS and the village councils are “in the process of negotiating with the department of the environment to identify an area for the disposal of garbage”. They also feel that children are the cause of garbage being disposed throughout the streets and they feel that several programs can be done to educate children and have them assist in the garbage collection process. They also suggested that the 10% of the revenues that the village obtains from the entrance ticket sales of CTWS should go directly into addressing some of these environmental issues within the community.
Children focus group Meeting Wildlife Harassment (Thursday October 18th, 2007)

Choosing the group- We decided to conduct this focus group because the principal of the local school had commented that she was very worried that the children would “do away with the birds”. They killed so many birds that she wanted to do something about it and therefore she implemented a rule in the school: that if someone is caught with a sling shot it would be confiscated.

Summary: From the focus group meeting with 8 children from the Crooked Tree Wildlife Sanctuary area what stood out the most was that predominantly boys between the ages of 10 and 15 kill and harass animals for enjoyment and some do so to make some extra pocket money. It was evident that they are very excited about killing animals and that most don’t feel that they are doing wrong – indeed they generally feel good about killing them. Only 2 out of 8 participants commented that they felt sorry after the act but, that they still do it because it is fun. It seems that the first stages of killing and harassing animals with sling shots, puss killers, dynamite and even pellet guns, is in preparation for when they get older and go hunting with their fathers, and other family members “I have a pellet gun and I shoot birds with that, when I go to high school my dad will take me hunting with it.”

Another child mentioned “we kill wood peckers because when we go hunting we eat them with packed bread’. According to the participants most birds that are killed are not eaten except in hunting situations and these would be selected species namely Wood pecker and pigeon.

The killing of birds for fun seems to be a culture among boys and they have even developed informal games and groups, something that resembles trophy hunting! They go out in groups during the summer to kill as many birds as they can, set average records of about 15 birds in one day! Each time the game is about “beating the record”. They also use the eggs of wildlife as part of their fun activities “sometimes we play war with iguana eggs!” There also seems to be hunting for profits among these children as young as 10.

Gathering from their conversation they capture and sell iguanas alive for between 5-12 Belize dollars. There seems to be a market for it in the village as one girl mentioned “my sister buys iguanas from Aron (a 12 year old child present at the meeting) to cook”. Apparently most of the children (present predominantly the boys) seem to have a business mentality about capturing the iguanas since they would not kill the animal “No if you want to sell it we don’t kill them! We capture them alive and you put them in cocus bag (sacks)!” They price them based on
the size and number of eggs it has “I sell guanas, most of the ones I get are for 10 dollars cause I get the big ones and some have the eggs!”.

This could be due to a high demand for this species or that they are trying to help out the family or a combination of both.

These children are well exposed to hunting as they know the location for hunting and could list all the animals that they have seen been hunted: peccary, gibnut, armadillo, deer, hicatee and iguana. They see hunting as a source of food and income. The girls don’t seem to be too involved in the killing and harassment of wild animals except for the harassment of bird eggs and iguana eggs in minimal quantities.

Limitations of the focus group meetings:

It is important to note that the information gathered during these focus group meetings were limited to several factors:

1. They represent the views, attitudes and opinions of a small portion of the community. In the Tourism focus group there was a more representative sample as the number of people involved in tourism is small. In the fishermen focus group meeting there were 3 fishermen and 2 fisher women which is a small fraction of the fishing population (estimated at 25 fishermen). In the children focus group only 8 children were sampled (estimated children population 200). In the cattle farmers’ focus group, all the farmers represented the group that complies with good animal husbandry. There was no representation of the group of cattle farmers that are known to not comply with good animal husbandry practices.

2. The views attitudes and opinions of the participants could have been influenced by other participant in the group.

3. The views attitudes and opinions of the participants could have been influenced by the facilitator being a staff member of the Crooked Tree Wildlife Sanctuary management agency, Belize Audubon Society (BAS). Though, the facilitator tried reducing this factor by wearing neutral clothing (deliberately not wearing staff field uniform) and by asking that answers be as honest and open as possible participants were aware that the facilitator is a BAS employee.
2.3 KAP survey methodology:

An important aspect of social marketing is market research therefore; a questionnaire was designed and used to add to the qualitative information being gathered in stakeholders and focus group meetings. Basic knowledge, attitudes and practice questions were developed (see Annex 1 for survey instrument).

To be able to assess the target audience adequately 5 rural communities (total population size of 51,423) and one urban community were sampled however, it was important to calculate the sample size of rural and urban communities separately. Rural communities in this case was considered to have a greater impact on Crooked Tree Wildlife Sanctuary but their population is small compared to the urban population; combining and calculating the sample size as a whole would heavily skew sample numbers to favor urban KAP. By calculating sample size for urban and rural separately, it ensures that enough data was collected from the rural communities. The population for each community is represented in the table 2 (page 18) along with the number of interviews that were conducted in each. This was calculated at a 95% confidential level and a 5 confidence interval.

Twelve enumerators were recruited through the University of Belize. During the time of the survey they were doing a Research Methods course and were further trained by the CM to conduct face to face interviews for the purposes of the survey. Other enumerators included 4 young adults from Crooked Tree Village who were also trained to administer this survey. These CT young adults were asked not to conduct surveys in Crooked Tree Village so as to reduce bias in random sampling and influence responses of participants. CM supervised the enumerating process.

Sampling was conducted at five sites including Crooked Tree Village, Biscayne, Lemonal, Gardenia and Belize City. Before conducting face to face surveys enumerators were trained rigorously to avoid bias in during interviews. Dates selected for the sites were on weekends when it was expected that most of the people were at home. In each site 5-8 enumerators were spread out to different sections of the community and ask to walk down the street and select every 2nd house to conduct the interviews. Depending on the population size for each community no more than 3-4 interviews could be conducted in a house hold.

For Belize City, because of it population (50,000) a different approach was used. Enumerators were selected from a cross section of high schools. They were rigorously trained and were asked to conduct 8-10 interviews at one time and to randomly select their interviewees.

Questions were read aloud by the enumerators. Answers were carefully recorded and written on the sheets by the enumerators themselves. Questions (see survey) were closed and open-ended, prompted and unprompted. Surveys were checked carefully before sampling the next person. The survey solicited information on prevailing levels of knowledge, attitude and behavior toward the Crooked Tree Wildlife Sanctuary in general and the threats it faces in particular; about media preferences, willingness to change behaviors, (benefits and barriers) and trusted information sources.
2.4 Threat Ranking and Ability to influence ranking

After loading the revised concept model into Miradi software, the “Threat Ranking” facility was used to rank each of the threats that had been identified. This work involved two processes, first ranking the threats by their scope, severity and irreversibility and then by the lead agency’s availability of resources and the social and political practicality of trying to address them.

The first was conducted in consultation with scientists working with the Belize Audubon Society on drafting three park management plans including Crooked Tree. They have extensive experience of the site and on the scope and severity of the various threats identified in this plan. The second process on the practicality of BAS focusing resources on a given threat was conducted in consultation with Anna Hoare, Executive Director for Belize Audubon Society.

**Scope, Severity & Irreversibility of threats**: First, threats were ranked by the area of the site they affect (scope), by the severity or level of damage caused by the threat, and by the level of irreversibility (if not mitigated the threat is likely to eliminate the target with little or no chance of regeneration)3. (see annex 7 for a key on this threat ranking)

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3 Threats are ranked on a qualitative scale (0 = None, 1 = Low, 2 = Medium, 3 = High, 4 = Very High) on each of three criteria (1) scope, or the area they affect, (2) severity or the level of damage they cause, and (3) irreversibility.
The following table shows the threat assessment including Unsustainable infrastructure developments:

<table>
<thead>
<tr>
<th>Threat (Factor)</th>
<th>Ranking $^5$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cumulative scope, severity, irreversibility</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Dumping of solid waste</td>
<td>LOW</td>
</tr>
<tr>
<td>Unregulated commercial net fishing</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Hunting</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Land clearing</td>
<td>HIGH</td>
</tr>
<tr>
<td>Wildlife harassment</td>
<td>LOW</td>
</tr>
<tr>
<td>Fire</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Water quality deterioration</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Tilapia competing with native fish</td>
<td>HIGH</td>
</tr>
<tr>
<td>Direct tourism threats</td>
<td>LOW</td>
</tr>
<tr>
<td>Unplanned infrastructure developments</td>
<td>HIGH</td>
</tr>
</tbody>
</table>

This threat ranking process was done twice due to issues previously mentioned. In the second threat ranking there were two major changes from the first threat ranking.

1. Unplanned infrastructure development was rated as HIGH based on scope, severity and irreversibility. This direct threat affects all the targets selected, but the threat for each was ranked separately and therefore revealed varied ranks for each.

$^5$ See illustration on the previous page for threat ranking by target. This table represents a summary of threats by project scope.
2. Land clearing increased from LOW to HIGH considering the open accesses to land within and in close proximity to the sanctuary and likely to threaten in the next year or two caused by the recent infrastructure development. This threat affects three of the targets selected namely, Jabiru Terrestrial Wildlife and Wetland System; ranked as HIGH, HIGH and MEDIUM respectively.

**Ability to influence:** A second screening of threats was then conducted to determine the Belize Audubon Society’s ability to influence each of them. While BAS has an abundance of competency, financial resources are limited. The project recognizes that while it is always desirable to focus on the threats ranked highest in the previous exercise, there is little point focusing on one for which the agency has no competence or resources in mitigating. (See annex 7 for the ranking key).

<table>
<thead>
<tr>
<th>Threat (Factor)</th>
<th>Criteria</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Organizational ability</td>
<td>Social practicality</td>
<td>Political feasibility</td>
</tr>
<tr>
<td>Tilapia competing with native fish</td>
<td>IUCN 6.1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Unregulated commercial net fishing</td>
<td>IUCN 5.4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Hunting</td>
<td>IUCN 5.1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fire</td>
<td>IUCN 7.1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Water quality deterioration</td>
<td>IUCN 9.3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Dumping of solid waste</td>
<td>IUCN 9.4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Land clearing</td>
<td>IUCN 1.3</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Wildlife harassment</td>
<td>IUCN 5.1</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Direct tourism threats</td>
<td>IUCN 6.1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Unplanned infrastructure Development</td>
<td></td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

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6 See next page
7 Scores 1-3 = Low; 4-6 = Medium; 7-9 = High; 10-12 Very High
2.5 Goal and Objectives of the Campaign:

Based upon the analyses the team developed a goal for the campaign and using data from the pre-campaign KAP survey SMART objectives were set:

Decrease the threat of unsustainable developments within the wetlands of CTWS by increasing awareness of the importance of wetlands and strengthening political and community relations.

(Sub goal) - To establish a practical and adoptable set of cattle farming guidelines that will guide cattle farming developments near the crooked tree wetlands and mitigate current impacts to the wetlands.

1. By May 2009, there will be a 20 % point decrease in the perception amongst the rural population that “ the wetlands are wastelands and should be filled and developed” from 41% down to 21%. This will indicate an increase in awareness of the importance of the CTWS wetlands to them and the nation.

2. By May 2009, there will be a 32 % point increase in those in the rural population who can name at least one threat to the wetlands of CTWS - from 43 % up to 75 % (currently 33% of the population say that there is no threat to CTWS and 24% say that they don’t know about any threat.) rural population (n= 277)

3. By May 2009, there will be a 20% increase of people living in the target area who understand the importance of planning the development that occurs within the CTWS wetlands and surrounding areas. BASE LINE DATA will be gathered.

4. By May 2009 3 out of 4 village councils will endorse the best practices guidelines developed by the cattle farmers by promoting it to existing and new cattle farmers.

5. By May 2009 there will be an increase of 25 percentage points of cattle farmers living in the rural communities who can name at least one way they benefit from the wetlands, from 27 % up to 52 %

6. By May 2009 cattle farmers will have developed a booklet with guidelines to conduct sustainable cattle farming around the wetlands of CTWS

7. 25% of farmers will be utilizing at least two of the more practical guidelines in the booklet, as measured during one-on-one site visits.
8. By May 2009 50% of farmers will be able to name at least 4 of the guidelines outlined in the best practice booklet.

9. By May 2009 the Local Advisory Committee (LAC) will select its new members (8-10) and actively participate in an advisory capacity in issues relating to PLANNING sustainable development in and around the wetlands of CTWS. This body will be formally recognized by the Belize Audubon Society and the Forest Department. (Currently the LAC has been dormant for more than four years)

10. By May 2009 political leaders in particular the area representative and the natural resource minister will publicly endorse and support Crooked Tree Wildlife Sanctuary’s status as a protected area and a RAMSAR site.

11. By May 2009 political leaders will adhere to the development regulations stipulated by law for the protection of CTWS and all development activities within the following 12 months, in and around CTWS will take into consideration the sensitivity of the wetlands and following the existing development guidelines such as environmental impact assessments and obtaining permits.

2.6 Campaign Design

To achieve the SMART objectives a mixture of activities were designed and where possible, implemented in a particular order. It was noted that when activities were implemented exactly in the theoretical order of behavior change, coupled with listening and carefully identifying and addressing barriers, they effectively achieve the campaign objectives. The Transtheoretical Model developed by Prochaska and DiClemente in 1983 was used to plan and organize the activities with the intention to move the audience through the five behavior change stages: from pre-contemplation to contemplation to preparation to action and to confirmation. Rare provided an equation to achieving conservation results which seemed to parallel the Transtheoretical Model of behavior change. The following is a representation of this equation with the desired objectives to be achieved in each stage which guided the design and implementation order of the activities.
Theory of change: equation used to successively achieve results

\[ K + A + IC + BR \rightarrow TR \rightarrow CR \]

**Knowledge**
- Rural people become aware of the wetlands of CTWS and its importance
- **Rural people and Farmers become aware of the threats to CTWS in particular land clearing too close to the water’s edge and the water quality issues caused by the cattle farming**

**Attitude**
- Rural people become proud of the wetlands CTWS.
- People become more receptive to BAS and trust the messages coming from the organization.
- Farmers become receptive to working together with BAS to

**Interpersonal Communication**
- People are receptive to BAS messages and are willing to discuss solutions.
- **People receive information from teachers and other media; they talk about wetlands and wetland issues.**
- Farmers talk to one another and to BAS, about finding solutions to cattle farming issues.

**Barrier Removal**
- **Partners (agric and BAS) provide farmers with demonstration sessions to implement behavior.**
- Partners provide farmers with starting tools (solar shock fencers, biogas digesters and grass seeds) to start and trail adoption
- **Partners (police and CTWS warden) are empowered and willing to enforcing the law in regards to cattle trespassing.**

**Threat Reduction**
- Elimination of cattle roaming free in the community and CTWS
- Farmers build farms 300-500 ft. away from the wetland
- Farmers leave primary forest in their farm

**Conservation Result**
- Water quality improves from____
- Protection of the wetland hydrology
- Protection of Nesting trees for Jabiru
Campaign Tagline or Slogan:

Crooked Tree Wetlands ga wi baak; as we develop, mek wi kip it laik dat!

Crooked Tree Wetlands supports us; as we develop, lets keep it intact!
### Chapter 3: CTWS Wetland Pride Campaign Activities

<table>
<thead>
<tr>
<th>Primary Audience A: rural population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity 1</strong></td>
</tr>
<tr>
<td><strong>Channel:</strong> Video and Video night shows</td>
</tr>
<tr>
<td>A video on Crooked Tree Wetlands was developed with funding from the Belize Audubon Society. This educational material was used throughout the campaign activities: teachers’ workshop, school visits, cattle farmer’s demonstrations, community meetings and was aired on national television (with campaign budget). The video also made the perfect educational material for Village Video nights. Coupled with the Jabiru Mascot, the wetlands song (for lyrics see annex 5), poster and buttons, the community became very interested in campaign activities.</td>
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</table>

| **Activity 2:**                      |
| **Channel:** Workshops              |
| **Vehicle:** Teachers summer camp on wetlands |
| **Key messages:**                   |
| 1. Crooked Tree wetland is a Wildlife Sanctuary and is for all Belizeans to care for it. It is managed by the Belize Audubon Society and the Forest Department for the people of Belize. “Crooked Tree wetlands ga wi baak as we develop, mek wi kip it laik dat!” |
| 2. A wetland is an area of land that is wet, or at |

Teachers are a trusted source of information about the environment (90% of rural survey population somewhat trust and trust teachers.) It was very important that teachers are knowledgeable enough to provide the right information to students and the general public. The teachers’ summer program was implemented from August 11th to August 14th 2008 for Crooked Tree Village teachers and on December 29 and 30th 2008 for Biscayne and Lemonal Teachers.
| 3. | Wetlands are important to people for many reasons, on very important reason in our country is that they act like a sponge, soaking up water and then releasing it bit by bit. They are therefore a natural flood control. |

| 4. | In Belize the CTWS absorbs and slows down the water coming from the Mayan Mountains and the Belize River which constitutes the biggest watershed system in Belize. In doing so it protects the Belizean people from flooding: Without the CTWS Belize city and surrounding communities would regularly be under water! |

| 5. | In Belize the Crooked Tree Wildlife Sanctuary is an important source of fish and water for the surrounding communities. It also is home to approximately 300 species of birds making it an attractive tourist destination. |

| 6. | Crooked Tree Wildlife Sanctuary has been awarded the global Ramsar designation by the international community because of its importance for migratory birds. |

| 7. | By working together and planning development in such a way that it continues to act as a flood control and water filtering system we can ensure that our land and people continue to be protected by wetlands “Crooked Tree wetland ga wi baak” |

| Through a fun, interactive and hands on learning experience teachers were able to increase their knowledge and skills to teach about protected areas, wetlands and other ecosystems in Belize and garner support for campaign messaging. See Appendix 2 for Teachers Summer Camp Agenda and Teachers Certificate |

| Benefits for teachers |

| - BAS applied for credits for teachers from the Quality Assurance Department in the ministry of education. They were awarded 24 credit hours for this session. |

| - They were provided with printed materials such as booklets, PA poster, and wetland lesson plan and activity booklet for use in their class rooms |

| - They were provided with a CD with all presentations and pictures presented during the workshop |

| - Certificate of completion |

| - Field experience at Cockscomb Basin Wildlife Sanctuary and CTWS |

The agenda was implemented smoothly throughout, though in Crooked Tree Village manager encountered some resistance and hesitancy at the initiation. However by the end of the 1st day teachers had gradually changed their attitude and were more open to participate and interact. At the end of each session an evening chat was conducted to get feedback from the teachers.
8. Despite its importance for people and the environment the future of the integrity Crooked Tree Wildlife Sanctuary is today uncertain. The increasing pressure of development and land clearing is reducing the ability of the wetland to carry out its important role of flood control and water filtering. If this trend continues there is a serious risk that the wetland won’t be able to protect our land and the people of Belize from serious flooding as well as continue to provide clean water and food to people and wildlife.

9. Developments that are not well planned can cause irreversible damage to the environment. It is important that development be done in a sustainable manner meaning that it takes into consideration the Social, the Economic and the Environmental aspects

The following were some of the comments made: See Appendix 3 for teachers evaluations

- “brilliant presentations”
- “I am glad we are learning really interactive ways to make the environmental information fun and dynamic because it is a hard subject for students.”
- “You opened my eyes to wanting to buy the Awakes as they have very good information, especially on the environment and we could relate it to Belize very easily”
- “The presentation from the Forest Department was a bit boring, his voice is monotonous, but the information he gave was extremely helpful and I would really like to have it printed, it is exactly what we should be teaching our children”
- “At first I always thought that no one should come and tell me what do to and how to do it in my own home, but when we did the activity today on the tarp I realized that people from outside can see the problem better and when tied up in a knot we can’t see it well, those from outside can help!”
- “I think that what we learnt here is not only to teach the children, but to teach everyone here in Crooked Tree and Belize because I am sorry to say this but our people are ignorant to what the wetland is for…they have no idea” (Ms. Shelyn Webster acting principal)
- “This morning when I woke up I was “vex” with my environment, I always wonder why we can’t have mountains and waterfalls around here…and that is why I would have liked to see this in nice big buildings…but after the activity with the sponge and the mud I really see why Crooked Tree is here and I not mad anymore I will certainly make other people know…the children I teach especially” (George Tillett Vice principal)
<table>
<thead>
<tr>
<th></th>
<th>“I think we should do something for the community to learn like in our parents meeting or in our assembly or our drama shows we could help!” (Ms. Winney Gillett, upcoming principal)</th>
</tr>
</thead>
</table>
Activity 3:

Channel: Performing Art

Vehicle: Variety Show in rural communities display threats CTWS faces and suggest appropriate behaviors (Planning for this activity: output of teachers’ workshop)

Key messages:

- The wetlands provide many benefits such as food, water, flood control, recreational area and much more for people and the economy.
- CTWS is threatened by many factors such as: pollution, agriculture, unsustainable tourism practices etc and if everyone does not do their part it will not be healthy, for our fish, and for our people.
- Developments in the area can cause irreversible damage to the wetlands and benefits provided by the wetlands if they are not planned and done properly.
- Cattle farming can be done in such a way that it will increase the farmer’s profits as well as be sensitive to the health of the wetlands.
- Healthy wetland= healthy people.
- The CTWS wetland is an important floodplain for the whole of Belize.
- If we want our wetlands to continue providing the services it currently provides we must act now.

There are some cattle farmers in CTWs and in the country that are doing practices that will maintain the health of the wetlands; and they are even benefiting financially!

The wetlands variety show was organized as a fun way of raising awareness about the wetlands ecosystem of CTWS. As a follow up to the teachers' summer program implemented in August (Crooked Tree Teachers) and December (Biscayne and Lemonal), teachers developed a skit that would help children to learn about the wetlands of CTWS. The three primary schools from the rural communities created several skits; one from each school was selected for performance at the bliss institute for the performing art.

Belize City primary schools were invited to this event, 376 city students attended and 250 children from the rural communities attended.

Evaluation

The activity was very well attended though it rained on the day. In general the activity was well received by the children and teachers. Comments from the teachers were that it was really nice to experience a fun way of learning about the environment, noting that they had done some environmental topics in class. Some even commented that BAS should have more events like these. The messages promoted through this medium were also received: children were quick to answer questions during the intermissions and this reinforced the
messages.

There were some ways to improve the smooth implementation of the event:

More practice of skits: some children were nervous and a few forgot their lines.

Practice at the Bliss: some children did not queue in at the right time, some were also confused about where they should enter or exit the stage. It was necessary that children be familiar with the setting and that they enter and exit smoothly.

Fine tuning of messages: some scripts needed to be refined.

The variety show highlights also was featured on BAS newsletter targeting BAS members and BAS sponsors.
### Activity 4:

**Channel:** Print Media  
**Vehicle:** Poster and Banners  
**Key messages:**

“Crooked Tree Wetlands ga wi bak; as wi develop, mek wi kip it laik dat!”

Crooked Tree Wetlands supports us; as we develop lets keep it intact!

---

**Be proud of our Crooked Tree Wildlife Sanctuary!**

It is our land protector and our children’s play ground. It is the sponge that hold water during the wet season, the water and fish supplier and home of approximately 300 species of birds and plenty other wildlife. It is also valuable for our tourism industry.

**Let us be good stewards of our wetlands by:**

- using our land efficiently
- organizing ourselves to plan our developments
- practicing good farming methods and sustainable

---

The [poster](http://www.rareconservation.org/blog/wp-content/ph) served as the main campaign material to promote the key messages:

1,000 posters were printed and distributed. The distribution plan consisted of placing posters in key locations such as community centers, bus sheds, shops, restaurants, and gas stations, in the communities of Lemonal, Biscayne, and Crooked Tree Village. Posters were also placed in key locations in Belize City. The poster was also given to partner agencies such as Forest Department and Agriculture Department to assist in its distribution. Some restaurants and shops asked for more copies to replace torn and worn out posters.

Teachers and students were awarded posters as prizes during campaign activities.
Activity 5:

Channel: Youth Involvement

Vehicle: Youth Summer Camp

Partnership with BFLA

Key Messages

- CTWS is threatened by many factors such as: pollution, agriculture, unsustainable tourism practices etc and if everyone does not do their part it will not be healthy, for our fish, and for our people.
- Developments in the area can cause irreversible damage to the wetlands and benefits provided by the wetlands if they are not planned and done properly.
- Cattle farming can be done in such as way that it will increase the farmer’s profits as well as be sensitive to the health of the wetlands.
- Healthy wetland= healthy people.
- If we want our wetlands to continue providing the services it currently provides we must act now.

The community youth are an important audience to target as they are at the point of formulating their ideas on social, economical and environmental issues. Reaching out to them at this stage and involving them in constructive activities is an investment that will reap benefits in the near future.

On July 10th 2008 BAS partnered with the Belize Family Life Association (BFLA) who implements a summer program at CTWS annually. Their theme “Our family and our environment” was quite fitting with the objectives of our campaign.

The youths participated in wetland exploratory experiments, a guided wetland boat trip through the wetlands and a discussion of the environment and how it benefits their families. The camp ended with a hand painting activity.
Activity 6:
Channel: Women involvement
Vehicle:
Women’s wetlands tour and afternoon chat:

Key Messages?

- The wetlands provide food for the sustenance of families throughout the communities
- A healthy wetland will mean a healthy supply of food products
- Wetlands provide a source of water
- Leaving trees to absorb pollutants is important for a clean supply of water
- Unsustainable cattle farming activities contaminate the healthy water supply of the community.
- Cattle dung can be a very useful form of fertilizer that can help back yard gardening (growing local fresh vegetables)

Women are important in influencing households as well as community affairs; therefore it is key that the campaign reaches them at a different level than teachers and farmers. While a workshop on curriculum related topics attracted teachers and demonstrations on farming methods attracted farmers, a wetlands boat trip was used to attract women from the community. Women were invited to be part a boat trip down the wetland lagoons and creeks to see its beauty and richness. After the trip, a 1hr chat was done to get feed back and perspective on the trip as well as to highlight key messages through interactive activities.

Women drew on paper their experience and spoke about the amount of birds they saw the beauty of the area and especially its tranquility. Some remembered stories of when there was no road linking Crooked Tree Village to the rest of the country and how their journey to Belize City was through the wetlands. Others talked about their fishing experiences and how they loved to go camping and fishing (line) in the area. During the trip one of the warden’s of CTWS, Derrick Hendy, gave a briefing of the rules of fishing and he also gave a warning to three individuals (not from the area) line fishing in a creek.
During the chat, three activities were chosen to deliver the key messages:

1. Soil and water activity which demonstrated how water filters through the ground making it possible for them to extract water from wells. During this activity the group discussed water in correlation with wet and dry season and with the importance of wetlands.

2. Celery water and food coloring activity which demonstrated how plants absorb pollutants from the water into their stems and leaves. A discussion on the importance of plants in absorbing pollution lead to the group realizing that plants especially near water areas were quickly being cleared.

3. The reading of the cattle farmers’ comic booklet lead to the discussion of the problem of cattle dung in the community and the best practices of cattle farming. Women also played the bird bingo as an extra activity!
Activity 7:

Channel: World Wide Web
Vehicle: BAS website and other conservation organizations

Key messages:

Campaign information and materials were uploaded on to the Belize Audubon Society website: www.belizeaudubon.org

Activity 8:

Channel: Consultation with community members
Vehicle: one on one meetings with respected community members of Crooked Tree

Key messages:

- CTWS is a wildlife Sanctuary and is managed by BAS for the people and government of Belize
- Since Crooked Tree Village is located directly in the middle of the Sanctuary it is important that this community actively participates and give managers advice on the management of CTWS
- CTWS is protected for the entire nation and people of Belize and the people of Crooked Tree are primary stakeholders.
- The wetlands of CTWS gives us many services such as food, water, flood control

Before the drafting of the best practices booklet for farmers the campaign needed to consult with the farmers to assess on a first hand basis the current farming practices. It was also important to collect their thoughts on how to conduct better farming practices as well as to determine some of the barriers to address. This activity was carried out by Orlando Jimenez, Belize Audubon Society’s community liaison. During this activity fifty cattle farmers were visited and approximately 35 were considered as full time cattle farmers. These farmers are from the buffer communities of the Sanctuary: Lemanal, Biscayne, Gardenia, Maypen and Crooked Tree. Most of the farmers are above 40 years and the oldest being 89 years. See Annex 4 for a complete report.
Activity 10:
Channel: Print Media (Cattle farming development guidelines comic booklet)
Vehicle: one on one distribution and signature of endorsement.

Key messages:
- CTWS is a wildlife Sanctuary and is managed by BAS for the people and government of Belize
- Since Crooked Tree Village is sitting directly in the middle of the Sanctuary it is important that this community actively participate and give managers advice on the management of CTWS in relations to the community.
- CTWS is protected for the entire nation and people of Belize and the people of Crooked Tree are primary stakeholders.
- The wetlands of CTWS give many services such as food, water, flood control and recreation.

Ten cattle farming best practices were identified by BAS and the Agriculture department that would help wetland conservation as well as increase profits and production of farmers. If farmers implemented the practices it will reduce impacts to the wetlands such as: soil compaction, deforestation, grazing and decrease in oxygen levels and water quality. These practices were promoted in the form of a comic booklet.

The ten practices included:

1. Fencing of cattle
2. Pasture Management (growing grass)
3. Leave 300ft or more (500ft) of forest cover around waterways.
4. Leaves primary canopy (e.g. Ceiba trees) in farms for shade and water retention
5. Uses trees such as Madre Cacao or gumbo limbo for fencing
6. Uses legumes or adequate types fertilizers that do not harm the environment
7. Uses some type of supplement feeding for cattle. (Sugar cane, hay, molasses blocks etc.)
8. Creative and profitable use of cattle dung
9. Keeps animals contained during the dry season for the majority of the time.
10. Keeps Records of their business activity
11. Treats their cattle with appropriate vaccines and medication. (not directly benefits the environment but very important for farmers)

Activity 11:
This activity was not implemented because it did not seem necessary at the time. Funding
Channel: Art and indoor paintings

Vehicle: Bus paintings (BUS as canvas)

Key messages:
- Farming around wetlands, healthy wetlands=healthy people – support good cattle farming practices! (describe them)

was invested in other activities that would yield better results.

Activity 12:

Channel: Experience

Vehicle: Over-flights around the wetlands (Wetlands from a Bird's Eye View).

Key messages:
- The Wetlands of CTWS holds and soaks a large amount of water, that comes down from tributaries and creeks in the Belize River Water Shed.
- The Wetlands is a highly complex system and developments in and around it need to be planned.
  - CTWS is vital for flood control, wildlife and fishing
  - It is threatened by many factors from fire to net fishing to cattle farming.
  - The community has an important role to play as advisors and communicators so that CTWS is well managed “balancing the needs of people and the environment”.
  - The LAC is the organization through which concerns of people can be made and worked out. It also builds the relationship between managers and the community for the continued protection of the wetlands and the benefits derived from it.
  - Increase infrastructure developments in cattle farming can alter the hydrology of the CTWS wetlands if not planned and conducted properly.

Four sets of over flights were carried out to take key community leaders to view the wetlands from “a bird’s eye view”. This activity was a key element in raising awareness about the wetlands and the importance of planning develops around the system among leaders and strong advocated in the community. The community members were selected strategically based on the influence they could have in the different committees or groups they belong to. The participants were:

Participants were first briefed on what to expect during the flight and were given maps of the area. During the flight pictures were taken through out and they were shown the different areas in relations to the map. After the flight participants were asked to set a suitable date for an evening chat about what they saw.

Note: The flights were made possible through a partnership between BAS and the Belize
Sustainable cattle farming practices are good for the health of the wetlands as well as for profits.

Defence Force (BDF). A donation from National Audubon’s board member Allan Model made the partnership stronger with the donation of a video camera to the BDF.

**Over Flight evening chat:**

All the participants that went on the flight participated in the over flight chat. During this session the pictures taken during the flight were shown to them pointing out the hydrology of the water and discussing the current environmental impacts and possible (future) impacts. The participants all shared their views on the wetlands with a prominent discussion in most sessions that they did not realize how much water Crooked Tree Wetlands could hold! They were impressed to see most of the area under water and discussed how beautiful their area looked from above.

It was very important to have the chat after this flight as the participants were able to ask questions about what they saw during the flight. A couple of them had misconceptions about what they saw for example the community woman Ms. Amelia was confused about some of the plants (agriculture) she saw and was also questioning whether the area we flew over was actually the village. The need for sustainable development came up in many ways and certainly the discussion on the road across the lagoon came up. The community police openly commented that people in the community are very hard to work with, but that many have a misconception about what BAS really does. He commented that he was not clear about the role of BAS but that he was beginning to understand and that he plainly thinks that BAS is the right organization to be responsible and defend such a place. He also mentioned that he was saddened by the attitudes of the people toward both BAS and the sanctuary but that work needs to continue.
Further comments by community members were very surprising: Mr. Dean Tillett commented that he could see the way BAS is acting strategically to convince them about the importance of conservation and that he was now convinced of the importance of the wetlands “It is like the wetlands and cohune trees were talking to us, make us know that we need to care for the area together”!

On the trip back to the Crooked Tree, discussion about the road came up and clarifications were made on BAS’ position. Jerry Jex specifically asked about BAS’ position on the road and questioned whether BAS was going to do the study needed. CM clarified BAS’ position in relation to the study: BAS can’t do the study since the developer needs to present the plan of the road along with the environmental impact assessment (EIA). It was explained that the Ministry of Environment had issued an environmental clearance plan (ECP) to the Ministry of Works and that they needed to contact the area representative for that information. At this point they were eager to learn more about the EIA process; which was another discussion that lead to the need for the re-activation of the Local Advisory Committee (LAC). The CTWS manager, Dominique Lizama was present and ready to discuss the need and importance of reviving the Local Advisory Committee (LAC). She explained the function of the LAC and asked them to sign up with her if they were willing to become part of the LAC.

The ultimate objective of this activity was to build the awareness and attitude necessary to actively participate in the LAC. 8 out of the 11 participants are now part of the LAC.

All community members were given a thank you certificate (Annex 6) for their participation in the activity and were also given a folder with pictures of the area. This was to encourage
them to talk to others about the wetlands and spread the message of the importance of the wetlands.

<table>
<thead>
<tr>
<th>ACTIVITIES: PRIMARY AUDIENCE – CATTLE FARMERS</th>
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<tr>
<td><strong>Activity 13:</strong></td>
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<tr>
<td><strong>Channel:</strong> One-on-one meetings (3 one-on-one meetings in each village)</td>
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<td><strong>Vehicle:</strong> Community liaison officer relationship building visits</td>
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<tr>
<td><strong>Key messages:</strong></td>
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<tr>
<td>▪ CTWS is vital for flood control, wildlife, fishing and a source of water</td>
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<td>▪ Increase infrastructure developments in cattle farming can alter the hydrology of the CTWS wetlands if not planned and conducted properly. BAS can provide you with training and can seek technical advice for you to make your cattle farming activities be in harmony with the wetlands</td>
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Before the drafting of the best practices booklet for farmers the campaign needed to consult with the farmers to assess on a first hand basis the current farming practices. It was also important to collect their thoughts on how to conduct better farming practices as well as to determine some of the barriers to address. This activity was carried out by Orlando Jimenez, Belize Audubon Society’s community liaison officer at the time. During this activity fifty cattle farmers were visited and approximately 35 were considered as full time cattle farmers. These farmers are from the buffer communities of the Sanctuary: Lemoinal, Biscayne, Gardenia, Maypen and Crooked Tree. Most of the farmers are above 40 years and the oldest being 89 years. See Annex 4 for a complete report.
Activity 14:

**Channel:** Planning Workshop sessions for cattle farmers with experts in the agriculture department

**Vehicle:** Meetings with experts

**Key messages:**
- CTWS is vital for flood control, wildlife, fishing and a source of water
- It is threatened by many factors from fire to net fishing to cattle farming.
- Increase infrastructure developments in cattle farming can alter the hydrology of the CTWS wetlands if not planned and conducted properly. BAS and Agriculture department can provide you with training and can seek technical advice for you to make your cattle farming activities be in harmony with the wetlands.

The Belize Audubon Society is a conservation organization and does not have expertise on best practices of cattle farming; therefore it was important to garner partnerships with farming organizations such as the Agriculture department, the Belize Livestock Producers Association and Inter-American Institute for Cooperation on Agriculture (IICA).

The campaign manager sent out letters to these organizations to explain the project and to request their assistance. During a meeting following the letter, the manager explained the importance of the program to CTWS. The organizations pledged technical support and assistance. Some of the outputs that were received from these partnerships were: Information and manuals on cattle farming practices for the development of the Cattle farmers’ comic booklet, technical support for farmer’s demonstrations, power point materials, training opportunities and training experts on farming practices and Biogas digester installation.

Activity 15:

**Channel:** Theoretical and Hands on Workshops
(4 day workshops on better animal husbandry techniques and 3 one-on-one meetings in each village)

A series of farming demonstrations and workshops were conducted throughout the campaign to break knowledge barriers about techniques and farming practices. These workshops or demos were preceded or in some cases proceeded by cattle farmers “chats” that were used a space where interpersonal communication could occur. Interpersonal...
During workshops: present case studies with evidence of “cattle farming around wetlands gone wrong”.

Vehicle:

**Key messages:**
- CTWS is vital for flood control, wildlife, fishing and a source of water
- It is threatened by many factors from fire to net fishing to cattle farming.
- Increase infrastructure developments in cattle farming can alter the hydrology of the CTWS wetlands if not planned and conducted properly.

Ten cattle farming best practices:
1. Fencing of cattle
2. Pasture Management (growing grass)
3. Leave 300ft or more (500ft) of forest cover around waterways.
4. Leaves primary canopy (e.g Ceiba trees) in farms for shade and water retention.
5. Uses trees such as Madre Cacao or gumbo limbo for fencing
6. Uses legumes or adequate types fertilizers that do not harm the environment
7. Uses some type of supplement feeding for cattle. (Sugar cane, hay, molases blocks etc.)
8. Creative and profitable use of cattle dung communication is an important element in the social marketing process and allows for greater adoption.

The series of workshops were started with a trip to central farm, a government owned farm that acts as a demonstration site. During this activity the farmers were given an overview of a well established farm that produces good profits with good practices. They were shown the different techniques and methods used and were briefed on the profits that the farm yields. 30 farmers from the area participated but only 2 farmers from the key target area (Crooked Tree Village) participated. The farmers learnt a lot from the field trip, but the activity was meant as a teaser and a “big” picture view. The field trip seemed to have enticed farmers as they started asking for more related activities.

Cattle farmers chats were later held to communicate to farmers the 10 practices that BAS was advocating for and the importance of these practices to conserve the wetlands of CTWS. Campaign materials such as poster and video were used to talk and discuss the wetlands and they were asked to suggest ways to move forward. They suggested that they wanted to learn how to make molasses blocks, and install electric fencers as well as to gain knowledge on the types of grass for pasture management. From their suggestion the demonstration priority topics were selected and assistance form the partner organizations was sought. The demonstrations were implemented and the farmers liked the practices and moved forward to discussing ways in which they can obtain the materials and the cost of these materials. They were very impressed with the way the solar shock fencers worked and negotiated with the campaign manager the possibilities of the project sponsoring a few solar shocks. The campaign manager agreed to look into the possibility.

After a number of demonstrations and chats a group of 10 interested farmers formed a
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<td>9.</td>
<td>Keeps animals contained during the dry season for the majority of the time.</td>
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<td>11.</td>
<td>Treats their cattle with appropriate vaccines and medication. (not directly benefits the environment but very important for farmers)</td>
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<td>group to be able to get materials at a discounted price.</td>
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### Activity 16:

**Channel:** Key influencer presentation  
**Vehicle:** Sermon  
**Key messages:**
- The Earth is God’s Creation, mankind is its steward

This activity was not conducted as was originally intended, due to more reasons than one. When church ministers were approach about putting together a Sermon they suggested that we visit their head offices and ask permission from their head ministers to send them the “green light”. The Sermon was not intended as an official activity coming from the head quarters of the churches, but instead as something the pastors wanted to do locally. Even though the idea was explained to the pastors in the most sensitive way they were doubtful of the goals of the Belize Audubon Society. The pastor of Lemonal Village had no problem and was excited about his sermon but the pastors in Crooked Tree Village were skeptical. In order to not cause doubts, confusions or mistrust this activity was not pursued.

### Activity 17:

**Channel:** Sustainable Cattle Farmer Competition  
**Vehicle:** Sustainable Cattle Farmer Award (promoting sustainable practices) prize awarded

This activity was originally planned as a sustainable cattle farmer’s award. This had to be revised after a few conversations with a group of farmers to determine their barriers. It was evident that this activity would not be feasible within the 10 month period as there were practical and financial barriers to adopting the new behavior. It was then decided that with the budget from this activity solar shocks and grass seeds (that do not compete with native grass) were purchased for farmers who were willing and ready to adopt five out of the ten best practices.

10 farmers volunteered for this activity and signed simple contracts with BAS on this...
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<tr>
<th>Activity 18:</th>
<th>Biogas demonstration Training</th>
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<tr>
<td><strong>Channel:</strong> Biogas Pilot Project Demonstration</td>
<td>The biogas digester training was implemented in collaboration with the Inter-American Cooperation in Agriculture (IICA) and the Agriculture Department. The BAS community liaison officer participated in a one week training at central farm along with two other farmers selected from the area. The training was given by a professor from Earth University in Costa Rica. The session ended with the installation of one biogas digester in Crooked Tree Village. The system was fed by the farmer with pig excrement every day for one month and was prepared to install the fixtures to the gas range stove. BAS and Agriculture extension officers monitored his progress. Officer from the agriculture department tested the system to determine the pressure of the digester. At that point they noted that it had more than enough gas and pressure after a large flame lit upon testing. Instructions were given to the farmer to purchase the materials necessary to install it to the gas range, however when the officers returned to his farm (BAS CLO as well) the farmer refused to continue with the project and gave several reasons (barriers) for discontinuation: 1. time consuming 2. Lack of finances to purchase materials for installation (worth approximately $70) 3. Medical Issues 4. Skepticism of the Belize Audubon Society’s objective of the project. Several objective visits were made to the farmer by the campaign manager, CTWS staff and BAS CLO to convince him to continue the project. With no avail the team amicably ended the continuation of this digester. The farmer has all the materials and tools to complete the project. It can only be hoped that he continues the project on his own. The farmer is using another of the best practices, that of using the animal dung as fertilizer for gardening. This method is a lot more labor intensive.</td>
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<td><strong>Vehicle:</strong> one pilot biogas project to be diffused to cattle farmers</td>
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<td><strong>Key messages:</strong></td>
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<td>If best practices are implemented you can benefit in profits and the wetlands can benefit in heath. Healthy wetlands= Healthy people You will receive a “healthy” reward for your efforts.</td>
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than using the water from the bio-digester to fertilize the plants and it lacks the benefit of being free from microorganisms that could cause disease in crops.

Second bio-digester

A second bio-digester was installed in the community of Lemonal with a younger pig farmer, who was very enthusiastic and committed to the entire process. However on the third week of feeding his system a COW fell into his pit and ruptured the polythene bag! He was very disappointed with this occurrence which also created some friction with the cow owner. This highlighted social issues of free ranging cattle. His polythene bag will be replaced and he will continue his project.

Five other bio-digesters

Since this was a collaborative project, five other digesters were installed throughout the country. BAS through the funding of RARE and NAS purchased the polythene bags for all the digesters while the Ministry of Agriculture Sponsored the training materials and covered expenses for the training. IICA sponsored the expenses and remunerations of the bio-digester specialist from Earth University in Costa Rica. Out of the five digesters 2 are in fully working order, two are on the process and another farmer discontinued his digester.

See report in Appendix X for a report from IICA
### Activity 19:

**Channel:** Outdoor media  
**Vehicle:** Billboards/ canvas  
**Key messages:**

- Farming around wetlands, healthy wetlands=healthy people – support good cattle farming practices! (describe them)

A large campaign banner was developed for the campaign activities. This banner was to be placed as a billboard in the City and or Community.

### Activity 20:

**Channel:** School visits  
**Vehicle:** School visits, Mascot, Song  
**Key messages:**

- Children may be the future but their voices need to be heard today  
- Children care about CTWS natural heritage and what happens to it  
- Children are interested, informed and want to play a role  
- Talk to your parents about environmental issues.

School children are an important audience as they can influence and take information to their parents. In addition they are the future citizens of the community and it is a long term investment for the future of the environment. Throughout the campaign several school visits were conducted at the three community school, each time carrying a new message but relevant to the campaign. In some instances presentations were done for the entire school group and in other occasions they were separated into grades or levels. Three sets of visits were conducted with different objectives including: 1. Naming and introducing the Jabiru Mascot 2: Importance of CTWS wetland and the threats
### ACTIVITIES: Enabling Audiences

**Activity 21:**

**Channel:** Meetings  
**Vehicle:** meetings

**Key messages:**

- CTWS is vital for flood control, wildlife and fishing.
- It is threatened by many factors from fire to net fishing to cattle farming.
- The community has an important role to play as advisors and communicators so that CTWS is well managed “balancing the needs of people and the environment”.
- The LAC is the mechanism through which concerns of people can be made and worked out. It also builds the relationship between managers and the community for the continued protection of the wetlands and the benefits derived from it.
- Increase infrastructure developments in cattle farming can alter the hydrology of the CTWS wetlands if not planned and conducted properly.
- Sustainable cattle farming practices are good for the

The Local Advisory Committee was reactivated through a series of activities and meetings. The community members who had been selected to go on the over flights were believed to be people that are true leaders in the community. After attending the over flight chats these key people were invited to a meeting an LAC on March 14th. It is with this group that the LAC was reactivated to re-establish communication with the community in the management of CTWS and to continue this communication after the campaign. During the meetings the following was addressed: The role of BAS in the community, the role of the LAC for the continued management of CTWS and the expectations from BAS as it related to the LAC. Much was discussed on the importance of the LAC and the group settle assisted in development of the criteria of the LAC. It was decided that a follow up meeting will be conducted to finalize the criteria and to discuss other issues. The PAM and CLO will give a detail report on the outcomes of this activity as well as on the progress of the advisory group. Worth mentioning is that Crooked Tree Village conducted a Bi-elections of its council and that one member in the present LAC, Eduardo Ortega, was elected as councilors. Other people with whom BAS is presently working closely with were also elected, Ms. Sherolyn Webster and Ms. Verna Samuels.
health of the wetlands as well as for your profits.

Meeting dates were established (twice per year) and if issues arise the LAC can call a meeting with BAS.

The main function of the LAC is to provide advice to the community and BAS for the proper management of CTWS. It will create a forum where community concerns as well as management concerns are discussed and possibly resolved.

**Activity 22:**

**Channel:** Political forum

**Vehicle:** Interactive Field Visit to CTWS on wetlands Day.

**Key messages:**

- CTWS is a sensitive area, community developments need to be planned and political leaders should support the planning that is required for this area.
- CTWS belongs to the entire nation and we (communities) are its stewards.
- The community has an important role to play as advisors and communicators so that CTWS is well managed “balancing the needs of people and the environment”.
- The LAC is the organization through which concerns of people can be made and worked out. It also builds the relationship between managers and the community for the continued protection of the wetlands and the benefits derived from it.
- Increase infrastructure developments in cattle farming can alter the hydrology of the CTWS wetlands if not planned and conducted properly. Sustainable cattle farming practices are good for the health of the wetlands as well as for your profits.

To get political leaders attentions and support for the Sanctuary leaders need to connect the wetlands to the benefits it provides to the people. Once people understand the benefits they can speak for themselves and lobby government to recognize and acknowledge its importance.

On February 2nd Belize Audubon Society joined the rest of the world in celebrating international wetlands day under the theme: “From Mountains to the Seas Wetlands that Work for us”. BAS hosted the leader’s visit to the Wildlife Sanctuary and launched the “Crooked Tree Wetlands Video” complimenting the day with a wetlands boat tour. Invited guests included the Governor General his Excellency Sir Colville Young, Hon. Edmund Castro-Area Representative and Minister of State in the Ministry of Works, Hon. Gaspar Vega represented by CEO Mrs. Beverly Castillo, Chief Forest Officer- Wilber Sabido, Village councils of Crooked Tree and Lemonal Village as well as teachers children and other community leaders.

“Crooked Tree Wetlands ga wi baak; as wi develop, mek wi kip it laik dat!” (Crooked Tree Wetlands supports us; as we develop lets keep it intact), was the main message shared during this wetlands day celebration. BAS president welcomed the guests to the event after which the Chief Forest Officer shared the role of Belize in the Ramsar convention and explained why Crooked Tree Wildlife Sanctuary was designated Belize’s first Ramsar site. Mrs. Beverly Castillo, Chief Executive Officer of the Ministry of Natural Resources delivered Hon. Vega’s message on the commitment of the Ministry of Natural Resources.
to maintain Crooked Tree Wildlife Sanctuary as a protected area and a Ramsar Site. Hon. Edmund Castro shared his views about balancing the need for development with the protection of the wetlands of Crooked Tree and Ms. Verna Samuels shared experiences of living near the wetlands and how the many resources have helped the community develop. At the end of the ceremonies BAS executive director Anna Hoare delivered the thank you and shared final messages.

The original intension of getting the leaders together was achieved however getting them to engage in critical conversation about the future of the area was a bit more difficult. The boat trip was included to allow the leaders to talk about the sanctuary in a relaxed manner, however this did not materialize.
Additional activities implemented beyond the plan

Toy Drive for children of communities affected by the flood (Crooked Tree and Lemonal):

During the hurricane season 2008 the communities of the campaign site were affected by two tropical storms, Arthur and tropical storm 16. The later did the most damage to the area as communities had to be evacuated due to an increase in more than 6ft in flooded waters. Campaign activities came to a halt during this two month period however the campaign team engaged in activities that could assist both the affected communities as well as the campaign. BAS designed a flyer to request assistance for children and families of the communities affected by the flood. The village council leader of Crooked Tree spearheaded a Christmas program for children, BAS joined in by collecting gifts and bringing the Jabiru Moscot to assist Santa at Lemonal on December 25th 2008 where the chair lady arranged a nice day party. A short Christmas message was given to the children by the community pastor after which messages about the Jabiru arrival to Belize and nesting habits were related to the Christmas story. Jabiru and Santa gave out 50 gifts to the children and soft drink (donated by Bowen) complimented their Christmas treat.

Christmas card
During the Christmas celebrations, BAS’ publicity coordinator developed Christmas cards using the campaign flagship species the Christmas messenger; these were sent out to a variety of people from community members, service providers, donors and partner organizations. This further contributed yo building pride and awareness of the Jabiru Stork.
Media Coverage on role of wetlands
Due to heavy flooding in Belize from October 20-24th the scheduled activities and field visits planned had to be cancelled and rescheduled. However, the flooding created an opportunity for to highlight the importance of the wetland in slowing down and absorbing the flooded waters. Since the local news was being watched by people throughout the country and especially the people of the target site, the media was used as the tool to send key messages. Channel 5 was covering a story in the area and the opportunity was quickly used. The following is an excerpt from that news cast:

Olivia Carballo Avilez, Ed. Mgr. Belize Audubon Society
“It retains the water like a sponge so it will probably take about three months for the water in this area to go down. And of course, we just want highlight and emphasise how important this wetland is and the role that it’s actually doing right now; just soaking up all the water that’s coming down from the Belize River Water Shed.”

Marion Ali
“Which it normally does every time it floods.”

Olivia Carballo
“Every time it floods but if this area wasn’t here, Marion, if we would develop this area it wouldn’t do that role and therefore, Belize City would get the brunt of all that flooding. So it’s very important to keep this area as it is; as a wetland and not develop it, not fill it, filling within the actual wetland so it could continue doing that for our country. So we’ll be losing some tourism money. The farmers will be losing money in this area, the people just commuting to and from; everybody. But, of course, we’re trying to—Belize Audubon Society has given a boat and fuel and staff time to ferry people to and from this area.”

Birding and Gardening Club
In an effort to continue outreach and education beyond the campaign a junior birding and gardening club were established through partnership with the Crooked Tree Government School. The bird club aims at fostering appreciation for birds discourage bird killing for fun and to possibly equip them with birding skills that can be used for bird guiding. The gardening club aims at getting the children involved in planting local plants and vegetables that are important for birds and people. They are being encouraged to use cattle dung as fertilizers.
Birding equipment was obtained for this club including: 10 birding back packs with (5) binoculars, birding field guides, checklists, T-shirts and rulers. These birding back packs will remain in custody of the wardens at CTWS. Gardening tools were also obtained.

Community interest in the birding club is increasing and the present group size of 13 can easily double if equip was available. Support has been given by the National Audubon Society who donated a spotting scope to the Sanctuary and is also being used by the birding club. Parental support has been very good as parents are dropping off children to birding sessions and are interested in find out what children are learning.

The gardening is gaining momentum slowly and wardens have advised that the birding club is also interested in doing gardening.
Chapter 4: Results Section

The data from the questionnaires collected during the post-campaign survey were entered into the same SurveyPro® data file that contained the pre-campaign survey data. A summary of the results from the pre-campaign was presented in the project plan (Carballo-Avilez 2008). There was a wide range of results collected but, the results presented in this section are only those related to assessing the impact of the wetlands campaign conducted from July 2008 to April 2009. For a complete tabulation of results please see Appendix X.

4.1 Comparability of two Surveys

In order to draw valid conclusion from the results of the pre and post surveys, it is important that the pre and post survey results be comparable in that the respondents in both samples are similar in the socio-economic and demographic characteristics. Table 1 list seven (7) Independent variables to provide a background on the characteristics of the respondents and to also determine the comparability of the surveys on each of these variables using the Chi-Square test of statistical significance. The independent variables measured here are Gender, Age Group, Formal Education, Religion, Occupation and Radio Listener ship. In the pre campaign the results were slightly skewed towards Females and in the Post Survey the results were slightly skewed towards male. The skew towards women in the pre-survey is more representative of the Belizean population, in the post survey results could have been skewed to males for probably two reasons (1) the campaign focused on farmers and farming methods therefore a quota was set for number of farmers (2) the surveys were conducted on a Sunday particularly on a Cricket day and enumerators most probably interviewed spectators, most probably a higher number of men spectators were present. However the results of Chi Square ($X^2$) tests indicates that there was no statistical significance for Gender, Age group, Religion or Radio listenership. Table 1 shows a good representation of age groups in both the pre and post survey with slight percentage point differences between them non exceeding 6 percentage points (pp). For Religion of respondents there was a 10 pp decrease of people with Baptist as their preferred religious denomination being interviewed in the post survey and a more distributed increase in Adventist, Catholic, Anglican and Nazarene. The majority of the population listens to radio 7 days a week.

Occupation was the only independent variable that showed a statistical significance between the pre and the post survey ($X^2= 99$%). This may be because enumerators were asked to “not lose the opportunity” to interview farmers, which was a specific target group for the campaign. As could be expected the education level among respondents reflected the skew towards farmers where there was a sharp increase in respondents in the post survey with “some primary school” and “primary school complete" but $X^2= 90$% not significant.
### Table 1: Independent Variables to Assess Comparability of the Survey

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-campaign</th>
<th>Post-campaign</th>
<th>Difference (Pre-Post)</th>
<th>Chi2 (x) significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male= 47.1%</td>
<td>Male=52.5%</td>
<td>-5.4pp</td>
<td>X² &lt; 50% Not significant</td>
</tr>
<tr>
<td></td>
<td>Female=52.9%</td>
<td>Female=47.5%</td>
<td>5.4pp</td>
<td></td>
</tr>
<tr>
<td>Age Group</td>
<td>&lt;15= 2.5%</td>
<td>&lt;15= 4.5%</td>
<td>&lt;15= -2pp</td>
<td>X² &lt; 50% Not significant</td>
</tr>
<tr>
<td></td>
<td>15-19= 11.6</td>
<td>15-19= 11.2%</td>
<td>15-19=.4pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20-24= 14.9</td>
<td>20-24= 9.1%</td>
<td>20-24= 5.8pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25-29= 8.7%</td>
<td>25-29= 7.9%</td>
<td>25-29=.8pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-34= 10.5%</td>
<td>30-34= 9.5%</td>
<td>30-34= 1pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35-39= 9.1%</td>
<td>35-39= 9.9%</td>
<td>35-39=-.8pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40-44= 10.2%</td>
<td>40-44= 14.0%</td>
<td>40-44=-3.8pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45-49= 6.5%</td>
<td>45-49= 7.0%</td>
<td>45-49=-0.5pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50-54= 5.1%</td>
<td>50-54= 9.1%</td>
<td>50-54=-4pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>55-59= 7.3%</td>
<td>55-59= 3.3%</td>
<td>55-59= 4pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60-64= 3.3%</td>
<td>60-64= 5.4%</td>
<td>60-64=-2.1pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>65-69= 6.2%</td>
<td>65-69= 3.3%</td>
<td>65-69= 2.9pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;69= 3.6%</td>
<td>&gt;69= 5.0%</td>
<td>&gt;69= -1.4pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No answer= .4%</td>
<td>No answer= 0.0%</td>
<td>No answer= -.4</td>
<td></td>
</tr>
<tr>
<td>Formal Education</td>
<td>No formal school= 2.2%</td>
<td>No formal school= 4.5%</td>
<td>No formal = -2.3pp</td>
<td>X² = 90% Not significant</td>
</tr>
<tr>
<td></td>
<td>Some primary school= 4.0%</td>
<td>Some primary school= 12.2%</td>
<td>Some primary = -8pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary school completed= 41.2%</td>
<td>Primary school completed= 31%</td>
<td>Primary cmplt= 10.2pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some secondary school =18.2%</td>
<td>Some secondary school = 13.2%</td>
<td>Some secondary = 13.2pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary completed= 18.2%</td>
<td>Secondary completed=16.1%</td>
<td>Secondary cmpltd=5.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sixth form or more= 13.1%</td>
<td>Sixth form or more=17.4%</td>
<td>Sixth form/more= -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vocational School= 1.5%</td>
<td>Vocational School=3.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No answer= 1.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>Adventist=14.1% Catholic=13.0% Baptist=30.8% Nazarene=8.3% Jehovah Witness=3.6% Pentecost=9.8% Wesleyan=5.1% None=6.5% Anglican=4.3% Evangelical=.4% Methodist=2.2% Other=1.8%</td>
<td>No answer=2.5%</td>
<td>4.2pp Vocational=-1.8pp No answer=2.5%</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Agriculture=4.7% Business=9.8% Educator=6.0% Fishing=7.2% Housewife=26.4% Hunting=7.6% Logger=1.4% Manual Laborer=4.7% No response=1.1% Not Employed=.4% Other=1.8% Public Service=1.1% Radio Broadcaster=0.4% Retired=1.4% Student=13% Un employed=12</td>
<td>Agriculture=14% Business=8.7% Educator=5.8% Fishing=6.6% Housewife=18.6% Hunting=0 Logger=0 Manual Laborer=11.6% No response=7.4% Not Employed=1.7% Other=2.1% Public Service=2.1% Radio Broadcaster=.4% Retired=2.9% Student=16.1% Un employed=2.1%</td>
<td>Agriculture=-9.3 Business=1.1pp Educator=1.1pp Fishing=.6pp Housewife=7.8pp Hunting=7.6pp Logger=1.4pp Manual Laborer=-6.9pp No response=-6.3pp Not Employed=-1.3pp Other=-.3pp Public Service=-1pp Radio Broadcaster=0pp Retired=-1.5 Student=-3.1 Un employed=9.9</td>
<td></td>
</tr>
</tbody>
</table>
### Radio listenership

<table>
<thead>
<tr>
<th></th>
<th>Never= 18</th>
<th>Never= 17</th>
<th>Never= 1pp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 3 day a week= 26</td>
<td>Up to 3 day a week= 41</td>
<td>Up to 3 day a week= -</td>
</tr>
<tr>
<td></td>
<td>4 to 6 days a week= 49</td>
<td>4 to 6 days a week= 35</td>
<td>15pp</td>
</tr>
<tr>
<td></td>
<td>7 days a week= 178</td>
<td>7 days a week= 148</td>
<td>4 to 6 days a week=</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7 days a week= 38pp</td>
</tr>
</tbody>
</table>

### Wetlands Campaign Activities

Table 2 shows the results from the pre and post campaign survey that shows the percentage of each target audience that recalls seeing/ hearing each the campaign activities.

#### Table 2: Dependent Variables to Assess Exposure to the Pride Campaign Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Farmers</th>
<th>General Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre (counts N=15)</td>
<td>Post (counts N=34)</td>
</tr>
<tr>
<td>Billboard</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Poster</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td>4</td>
<td>27</td>
</tr>
<tr>
<td>Song</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Variety Show</td>
<td>2 (14.3%)</td>
<td>5 (14.3%)</td>
</tr>
<tr>
<td>Video Show</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Coloring book</td>
<td>NA</td>
<td>4</td>
</tr>
<tr>
<td>Comic Booklet</td>
<td>NA</td>
<td>7</td>
</tr>
<tr>
<td>Workshops</td>
<td>NA</td>
<td>13</td>
</tr>
<tr>
<td>News</td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>Activities as a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

X²= 50% Not Significant

4.2 Exposure to the
From the results it could be deducted that there are some notable trends but it is difficult to determine actual exposure to this campaign because of (1) exposure to other campaigns related to wetlands and (2) the vagueness of the questions asked. Though there was another mini wetland campaign being conducted by the Department of Environment (target audience= Entire country) precise exposure results could have been collected if the questions were specific to this wetland campaign (e.g. Have you heard a song on wetlands by Lee La Vernon; have you seen a Jabiru Poster? etc).

The lowest exposure was Variety Show, Coloring Book and Billboard. The highest relative exposure was from radio, news, poster and video Show. A variety show was conducted by the campaign but the target audience was urban children and performed by the Rural Children. Children were not interviewed therefore adult exposure to this activity was expected to be limited. Though coloring books were made as a printed material for the campaign they had not been released to the public before data collection (added activity). In a follow up survey this 20.3% can act as the pre-survey data. A billboard for the campaign was created but not erected in a prominent place as this was used as a mobile display during events.

It seems that people are talking more about the environment for reasons that can be more than the impacts of the campaign when asked: In the last six months have you spoken to anyone about the environment 17.1% responded said yes in the pre-campaign increasing to 29.9% in the Post survey. This shows a statistical significance = 99% (Chi sq =99%).

### 4.3 Impact of Wetland Pride Campaign on Knowledge

Table 3 table shows results for knowledge based pre and post questions in the survey. Parts of these may be used in the objectives section and in the critical review discussion. Bolded text below highlights the variables of interest.

The results in table 3 highly support the hypothesis that the Wetlands Campaign conducted in the area increased knowledge about wetlands of Crooked Tree Wildlife Sanctuary. All the knowledge variables increased above 10 pp difference and on an average the knowledge variable increase was 23pp positive difference. The highest increase (34pp) was noted for people recognizing a shown picture of a wetland as a wetland (stating the correct term). All the knowledge variables in the table resulted in a significant Chi squared, except for “If a person uses nets to fish in the wetlands of Crooked Tree Wildlife Sanctuary is this...legal, illegal or don’t know”. Though there was a slight percentage

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>-18.8pp</th>
</tr>
</thead>
</table>

| whole |   |   |   |
point increase (7pp) probably as a result of it being mentioned as one of the threats in one of the campaign materials (the wetlands video) this threat or illegal activity was not the focus of the campaign. The mentioned of this threat was not repeated in other campaign materials and activities, therefore reflects the low pp positive difference.
### Table 3: Changes in Knowledge between Pre and Post Surveys

<table>
<thead>
<tr>
<th>Question</th>
<th>Variable</th>
<th>Pre-campaign (N=277)</th>
<th>Post-campaign (N=248)</th>
<th>Difference (Pre-Post)</th>
<th>Chi² X² significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>What type of habitat (land) do you think this is?</td>
<td>Said Wetland(s)</td>
<td>20% 41% 40%</td>
<td>54% 23% 23%</td>
<td>+34pp -18pp -17pp</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td>Did not say wetlands</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t Know</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>23%</td>
<td>27%</td>
<td>+4pp +23pp</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7%</td>
<td>30%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>70%</td>
<td>44%</td>
<td>-26pp</td>
<td></td>
</tr>
<tr>
<td>What do you understand by the term “Wetlands”</td>
<td>Basic Understanding</td>
<td>23% 7% 70%</td>
<td>27% 30% 44%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Understands Completely</td>
<td>23% 7% 70%</td>
<td>27% 30% 44%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>7%</td>
<td>30%</td>
<td>+22pp</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td>Does not Understand</td>
<td>70%</td>
<td>44%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetlands of Crooked Tree Controls Flooding for Belize City and other communities</td>
<td>Strongly Agree</td>
<td>18% 40% 13% 12% 2% 16%</td>
<td>40% 38% 8% 7% 2% 5%</td>
<td>+22pp -2pp +5pp -5pp 0pp -11pp</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>40% 13% 12% 2% 16%</td>
<td>40% 38% 8% 7% 2% 5%</td>
<td>+22pp -2pp +5pp -5pp 0pp -11pp</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>12%</td>
<td>7%</td>
<td>-2pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>2%</td>
<td>2%</td>
<td>-5pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>16%</td>
<td>5%</td>
<td>-11pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t Know</td>
<td>70%</td>
<td>44%</td>
<td>-26pp</td>
<td></td>
</tr>
<tr>
<td>Cattle dung and other agricultural products affect the health of the wetlands</td>
<td>Strongly Agree</td>
<td>24% 40% 11% 10% 4% 12%</td>
<td>42% 28% 9% 11% 5% 6%</td>
<td>+18pp -12pp 2pp +1pp +1pp -6pp</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
<td>40% 11% 10% 4% 12%</td>
<td>42% 28% 9% 11% 5% 6%</td>
<td>+18pp -12pp 2pp +1pp +1pp -6pp</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>11%</td>
<td>9%</td>
<td>-11pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
<td>2%</td>
<td>4%</td>
<td>-6pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>4%</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t Know</td>
<td>72%</td>
<td>52%</td>
<td>-20pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>14% 11%</td>
<td>17% 31%</td>
<td>+3pp +20pp</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>2%</td>
<td>2%</td>
<td>+2pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>72%</td>
<td>52%</td>
<td>-20pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4%</td>
<td>1%</td>
<td>-3pp</td>
<td></td>
</tr>
</tbody>
</table>

Note: Question was asked as an open ended questions and categorized in the variables shown here.
### If a cow, sheep, pig or horse, is roaming free in the streets in open lots or in protected areas like Crooked Tree Wildlife Sanctuary is this…

<table>
<thead>
<tr>
<th>Legal</th>
<th>Illegal</th>
<th>Don’t Know</th>
<th>Total</th>
<th>18%</th>
<th>69%</th>
<th>12.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*No base line data. This question was not included in the pre-survey but seen necessary after the campaign*

### If a person uses nets to fish in the wetlands of Crooked Tree Wildlife Sanctuary is this considered?

<table>
<thead>
<tr>
<th>Legal</th>
<th>Illegal</th>
<th>Don’t Know</th>
<th>Total</th>
<th>32%</th>
<th>56%</th>
<th>13%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th>25%</th>
<th>63%</th>
<th>12%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-7pp</td>
<td>7pp</td>
<td>-1pp</td>
</tr>
</tbody>
</table>

\(X^2\) below 50% Not significant

<table>
<thead>
<tr>
<th>Knowledge Questions</th>
<th>Total percentage points for favored responses</th>
<th>136 pp</th>
<th>260 pp (excluding Q-6 due to lack of pre survey data)</th>
<th>124pp</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Knowledge Questions</th>
<th>Average percent for favored responses</th>
<th>136/600*100= 23%</th>
<th>260/600*100= 44%</th>
<th>21pp</th>
</tr>
</thead>
</table>

### 4.4 Achieving Objective 1 and 2

In Table 4 objectives 1 (A) shows a SMART Objective attainment of only 35% (7pp difference), however additional data extracted from the survey results give strength the 35% objective attainment. For example when asked about the importance on wetlands there was a 24 pp positive difference between the pre and post survey. Using this question to represent data for objective 1 (A) there would be a 120% attainment of the objective. Another piece of data that gives strength to the change in attitude towards wetland is the 26 pp increases in people saying that Crooked Tree Wildlife Sanctuary is important as a protected area (130% objective attainment) and the 21 pp increase in people who think that Birds are very important. It is also valuable to note that people saying that Birds are not important went down to 0%.
Table 4: Changes in Attitudes between Pre and Post Surveys

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-campaign (Rural) (N=277)</th>
<th>Post-campaign (Rural)</th>
<th>Difference (Pre-Post)</th>
<th>Chi² X² significance</th>
<th>SMART Obj attainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTITUDE CHANGE</td>
<td>1 By May 2009, there will be a 20 percentage point decrease amongst the rural population that [strongly agree and agree] that “the wetlands are wastelands and should be filled and developed” from 41% down to 21%. This will indicate an increase in awareness of the importance of the CTWS wetlands to them and the nation. (n= 277).</td>
<td>Strongly Agree and Agree= 41% (N=112)</td>
<td>Strongly Agree and Agree= 34% (N=83)</td>
<td>-7pp (decrease pp preferable for this question)</td>
<td>X²= 99% Significant</td>
</tr>
<tr>
<td></td>
<td>Strongly disagree and disagree = 42% (N=113)</td>
<td>Strongly disagree and disagree= 53% (N=128)</td>
<td></td>
<td>11pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neutral= 8% (N=22)</td>
<td>Neutral= 7% (N=17)</td>
<td></td>
<td>1 pp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t Know= 9% (N=24)</td>
<td>Don’t Know= 5% (N=13)</td>
<td></td>
<td>4pp</td>
<td></td>
</tr>
<tr>
<td>Importance of wetlands?</td>
<td>Very Important= 57%</td>
<td>81%</td>
<td>+24pp</td>
<td>120%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some What important= 29%</td>
<td>15%</td>
<td>+14pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Important= 7%</td>
<td>2%</td>
<td>-5pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t Know= 8%</td>
<td>2%</td>
<td>-6pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of Crooked Tree</td>
<td>Very Important= 50%</td>
<td>76%</td>
<td>+26pp</td>
<td>130%</td>
<td></td>
</tr>
<tr>
<td>Wildlife Sanctuary</td>
<td>Some What important= 33%</td>
<td>18%</td>
<td>+15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Important= 11%</td>
<td>3%</td>
<td>-8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t Know= 6%</td>
<td>2%</td>
<td>-4%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Importance of Birds

<table>
<thead>
<tr>
<th>Importance Level</th>
<th>Pre-campaign (N=277)</th>
<th>Post-campaign (N=248)</th>
<th>Difference (Pre-Post)</th>
<th>Chi² X² significance</th>
<th>SMART Obj attainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Important</td>
<td>87%</td>
<td>47%</td>
<td>+41pp</td>
<td>X²= 99% Significant</td>
<td>12.5% (4pp/32pp *100)</td>
</tr>
<tr>
<td>Some What Important</td>
<td>12%</td>
<td>28%</td>
<td>+10pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Important</td>
<td>0%</td>
<td>9%</td>
<td>-3pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t Know</td>
<td>1%</td>
<td>11%</td>
<td>-2pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 By May 2009, there will be a 32 percentage point increase in those in the rural population who can name at least one threat to the wetlands of CTWS. From 43% up to 75% (currently 33% of the population says that there is no threat to CTWS and 24% say that they don’t know about any threat.) rural population (n= 277)

#### Total percentage points for favored responses

<table>
<thead>
<tr>
<th></th>
<th>Pre-campaign (N=277)</th>
<th>Post-campaign (N=248)</th>
<th>Difference (Pre-Post)</th>
<th>Chi² X² significance</th>
<th>SMART Obj attainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle dung and other agricultural products affect the health of the wetlands</td>
<td>42%</td>
<td>28%</td>
<td>+14pp</td>
<td>X²= 99% Significant</td>
<td>12.5% (4pp/32pp *100)</td>
</tr>
<tr>
<td>Strongly Agree 24%</td>
<td>42%</td>
<td>28%</td>
<td>+14pp</td>
<td>X²= 99% Significant</td>
<td>12.5% (4pp/32pp *100)</td>
</tr>
<tr>
<td>Agree= 40%</td>
<td>28%</td>
<td>22%</td>
<td>-6pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral= 11%</td>
<td>22%</td>
<td>9%</td>
<td>-13pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree= 10%</td>
<td>11%</td>
<td>11%</td>
<td>-2pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Disagree= 4%</td>
<td>5%</td>
<td>5%</td>
<td>0 pp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t Know=12%</td>
<td>6%</td>
<td>6%</td>
<td>0 pp</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

329 (of 700) | 450 (of 700) | 121pp
4.4 Objective 3, 4, 5 and 6

3) By May 2009 cattle farmers will have developed a booklet with guidelines to conduct sustainable cattle farming around the wetlands of CTWS

A booklet on best practice of cattle farming was developed in a collaborative way with the Agriculture Department and farmers. First the Campaign team meet to discuss the conservation objectives or goals needed to be achieved and these were identified as improve in water quality, reduction of overgrazing, reduced soil compaction caused by cattle trampling, reduce run offs from farms, reduce erosion, sustainable clearing of trees around the wetland, maintenance of primary forest needed for Jabiru nesting. These conservation objectives were delineated and presented to the Agriculture head extension officer Mr. Manuel Cowo who devised a first draft of the booklet to address cattle farming issues in a context that would also yield profits for farmers. Once the booklet was drafted, it was stream lined to 15 Best practices and presented to farmers during informal meetings called “Cattle Farmers Chats”. During these sessions the best practices were validated to determine benefits for farmers. 10 priority practices were selected. With the materials and descriptions provide by the agriculture department, a booklet detailing the procedures for these practices was produced. To promote the practices using a social marketing approach a comic booklet promoting the 10 best practices was developed and distributed to farmers, agriculture department and the public at large. Included in the booklet was information about Crooked Tree Wildlife Sanctuary and an excerpt of the Cattle Trespassing Act from the Laws of Belize. Farmers who were interested in learning more about these practices requested training and farmers like Mr. Rudy Crawford who knew a great deal about cattle farming (but does not necessarily implement the practices) volunteered time to train the other farmers. This was well received as this meant that farmers were moving along the behavior change continuum: they were preparing for action after

1. Use of Solar Shock Fencers to contain cattle
2. Pasture Management (growing grass for cattle containment)
3. Leaving 500-300ft of forest cover around the wetlands of CTWS.
4. Leaves primary canopy (e.g. Ceiba trees) in farms for shade, water retention and Jabiru Nesting
5. Uses trees such as Madre Cacao or gumbo limbo for fencing
6. Uses legumes or adequate types fertilizers that do not harm the environment
7. Uses some type of supplement feeding for cattle. (Sugar cane, hay, molases blocks etc.)
8. Creative and profitable use of cattle dung (vegetable farms or biodigester)
9. Keeps animals contained during the dry season for the majority of the time.
10. Keeps Records of their business activity
talking, discussing and sharing information and benefits of cattle farming best practices. In addition during the demonstrations and trainings a DVD with the practices was developed.

4) 25% of farmers will be utilizing at least two [five] of the more practical guidelines in the booklet, as measured during one-on-one site visits.

Through the campaign live demonstrations on selected practices were carried out (molasses block making, setting up solar shock fencers) this helped to further demonstrate to farmers the benefits and methods of these practices. Participating and engaging into these activities prepared the farmers for action. On April 27th 2009, 10 farmers out of 35 signed a small agreement with BAS to install solar shock fencers and to start planting grass seed to supply feed for cattle. One farmer had already installed his solar shock fencer as a result of the demonstration. Another farmer had reported that his installation was almost complete.

Apart from the 10 farmers stated above, two farmers agreed to pilot a bio-digester in their farms. One farmer is now receiving methane benefits from his digester. The other farmer is in progress of preparing the digester.

5.) By May 2009 the Local Advisory Committee (LAC) will select it's new members (8-10) and actively participate in an advisory capacity in issues relating to PLANNING sustainable development in and around the wetlands of CTWS. This body will be formally recognized by the Belize Audubon Society and the Forest Department. (Currently the LAC has been dormant for more than four years)

In order to continue activities and conservation work in the area it was important to establish good relationships with the community and gain their trust. Trust in the information given by NGO staff such as BAS staff grew from 25% to 50%. This was particularly important for the establishment of the Local Advisory Committee which after much work was revived at the end of the campaign. This committee consists of 9 members representing different sectors in the community: Women, youth, village council, farmers, fishers and teachers.

The Protected Areas manager and staff of BAS- Crooked Tree Wildlife Sanctuary will host follow up meetings and discussions on different PA management activities.
6) By May 2009 political leaders in particular the area representative and the Natural Resources Minister will publicly endorse and support Crooked Tree Wildlife Sanctuary’s status as a protected area and a RAMSAR site.

On February 2nd 2009 the Area Representative Honorable Edmond Castro publicly endorsed the CTWS as a protected area making specific reference to the importance of balancing people and the environment. Present to witness this speech was the Governor General of Belize, President, Executive Director and staff of BAS, representatives from the Forest Department and Ministry of Natural Resources (CEO), community leaders, children and teachers
Chapter 5: Critical Review:

The Social marketing approach was used throughout the Crooked Tree Wetland Pride campaign to plan and execute activities. Alan R. Andreasen in *Marketing Social Change* defines social marketing as: “the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the voluntary behavior of target audiences in order to improve their personal welfare and that of their society.” Though it was not the first time the project leader and the lead organization attempted to use social marketing techniques such as posters, buttons, etc, it was the first time that the step by step social marketing approach was used to implement a conservation project. The following is intended as a critical review of two activities that seemed to work when using the techniques of this approach and two activities that did not work as expected for reason that might be attributed to missing a step or link in the social marketing process that was essential.

5.1 Teachers Summer Program

Teachers are a trusted source of information about the environment (90% of rural survey population somewhat trust and trust teachers.) McKenzie-Mohr, in Fostering Sustainable Behavior discusses that “The person who presents your message can have a dramatic impact upon how it is received. In general, the more credible the person or organization delivering the message, the more influence there will be upon the audience”. It is with this very quote in mind that the teacher’s summer camp was an important component at the onset of the campaign. The underling objective of the teacher’s workshop was to get assistance from teachers in delivering messages to the community through interpersonal communication and through children. The workshop was reframed to “Teacher’s Summer Camp” to make it more exciting and attractive to teacher’s participation. To reduce barriers and increase benefits for participation teacher credits were obtained from the Ministry of Education.

The camp was designed to increase knowledge, values of wetlands, increase positive attitudes towards wetlands and create a space for teachers to talk about issues related to the wetlands, especially those that they are interested in such as the issue with a road being built through the wetlands. The activity would gradually help teachers progress into behavior change: assisting in being messengers of the campaign activities.

Networking and fostering Partnerships

- Education department- Quality Assurance Department (QAD) Teachers’ credit hours for participation and completion of the summer program.
- Forest Department- Presentation on Protected Areas and the laws regarding these protected areas. Ramsar Sites and co-management with the Belize Audubon Society.

Pictures of the activity:
Assessments

This activity was one of the first activities of the campaign for the strategic purpose to be the “bridge” to the community. On the first day, though teachers were polite and courteous to the team they were very hesitant to participate and there was generally a tense atmosphere. After certain activities, time was given for reflection and discussion. These discussions and interactive activities lead to knowledge and awareness building into interpersonal communication and general acceptance and trust in the facilitators. The comments from each day’s “chat” show the gradual process.
Day 1

- “brilliant presentations”
- “I am glad we are learning really interactive ways to make the environmental information fun and dynamic because it is a hard subject for students.
- “You opened my eyes to wanting to buy the Awakes as they have very good information, especially on the environment and we could relate it to Belize very easily”
- “I thought this was going to be boring but I learnt so much I am glad I came”

Day 2

- “The presentation from the Forest Department was a bit long, his voice is monotonous, but the information he gave was extremely helpful and I would really like to have it printed, it is exactly what we should be teaching our children”
- “At first I always thought that no one should come and tell me what to do and how to do it in my own home, but when we did the activity today on the tarp I realized that people from outside can see the problem better and when tied up in a knot we can’t see it well, those from outside can help!”

Day 3

- “This morning when I woke up I was “vex” with my environment, I always wonder why we can’t have mountains and waterfalls around here...and that is why I would have liked to see this in nice big buildings...but after the activity with the sponge and the mud I really see why Crooked Tree is here and I not mad anymore I will certainly make other people know...the children I teach especially” (George Tillett Vice principal)
- “I think that what we learnt here is not only to teach the children, but to teach everyone here in Crooked Tree and Belize because I am sorry to say this but our people are ignorant to what the wetland is for...they have no idea” (Ms. Shelyn Webster acting principal)
- “I think we should do something for the community to learn like in our parents meeting or in our assembly or our drama shows we could help!” (Ms. Winney Gillett, upcoming principal).

As one of the teachers suggest, they realized that they needed to educate people about the wetlands “the voluntary behavior change” desired in this activity. The CM then assessed the barriers they might have to actually do the behavior (time, materials, assistance). These barriers were reduced by taking their suggestion of conducting a session during their parent teacher meeting and committing to supply materials and assistance. On a later date teachers set the date for the follow up activity and informed the team.

From talk to action

The teachers choose to conduct the wetlands mud pie activity and insisted that BAS (campaign manager) should do a presentation about the Crooked Tree Wildlife Sanctuary. CManticipated the hesitancy of the community toward the presentation as for this community; NGO staff are not a highly trusted source of information. However the manager agreed because though the messages would be questioned, the population generally values organizations assisting the education system and teachers. Though campaign messages were the main topic of the presentation (10 minutes)
purpose was not to increase knowledge but rather to make an effort to increase receptiveness from the community and to make the community aware that BAS was partnering with teachers to assist in educational initiatives.

As was expected parents were very receptive to the activity by teachers and interacted well answering questions by teachers and even asking questions. The atmosphere during the campaign manager’s presentation was generally “cold” or tense, parents were not willing to answer questions and there was little discussion. Some weeks after this activity however, feedback received from different community members was that they enjoyed the baby bath tub activity and learnt how their wetland functions, they commented that they are happy that BAS is helping teachers with activities like those and that teachers were able to present to their community. This was reflected exactly the intended outcomes.

After the training and this activity teachers became very enthusiastic especially with the response from their parents. Teacher then were convinced that they were key messengers and were willing to assist with other activities. Together with the Cmthey planned, organized and implemented two other activities: Wetlands Variety Show by children for children and a Village Video Night. They also implemented many of the activities they did during the training in their own class rooms. Pictures of birds and wetland animals became inspirations for their corners and class room visual aids.

5.2 Cattle Farmers “Chats” and Demonstrations

Reducing barriers for adoption of cattle farming best practices

After engaging farmers through several mediums, some farmers had moved toward the preparation stage for behavior change. The activities implemented to move farmers on the Pre-contemplative and then to contemplative stages of behavior change were: flights over the wetlands to see the it role, function and the impacts and possible impacts; communication through teachers and children, video on the importance of the Crooked Tree Wetlands, poster and wetland song. It was noted that farmers identified as “ready” for the preparation stage came at different stages and was gradual. Farmers “chat” (meetings reframed) were hosted to discuss the way forward in terms of doing something about the issues with cattle. In the first chat 7 farmers came the session. The farmers that came were mostly those who had previously participated or were invited to the over flights. During this session some phases of implementing the behavior changes were charted by the group, this was seen as essential because according to Andreasen “If the task cannot be made simple, then social marketers should attempt to develop a gradual approach by which the behavior could be adopted in steps.” The group suggested activities for the next step one of which was training in molasses block making (supplement feed for cattle- one of the ten practices).
In the second session 10 farmers came to the “chat”, an increase of three farmers. During this chat an agriculture extension officer was invited as the technical expert for the molasses block demonstration, materials were obtain and methodology showed. Further discussion on the use of the block and cattle nutrition and health was discussed. The nine other practices were reviewed and the group decided on the following demonstration “how to install solar shock fencers”. One of the influential cattle farmer’s volunteered to assist with this as he had knowledge on this type of technology but confirmed that he did not have one installed in his farm. Materials were obtain for this demonstration and another demo was implemented. 12 farmers came to this session an increase of 2 farmers. Mr. Rudy (influential farmer not usually supportive of conservation efforts) implemented the activity at a farmers plot. After this session another “chat” took place where the low cost and farm benefits were discussed. Farmers openly indicated that they really liked the technology and were convinced that could work to solve cattle trespassing issues. They negotiated to obtain funding support for solar shock fencers. CMagreed to seek funds to obtain the fencers, but they would be responsible for the other materials and for the implementation of other best practices.

Solar shocks were acquired and a written agreement was made between BAS and the farmers. According to McKenzie-Mohr “Written commitments appear to be more effective than verbal commitments”. 10 farmers signed the agreement and committed to installing the fencers along with planting grass seeds (5 lbs of grass seeds were also given supplies as starters) for supplement feed for cattle (instead of cattle grazing the wetlands).

Fostering social diffusion has appears to be a powerful process, therefore it is hoped that if these 10 farms adopt these behaviors, with proper direction it could help other farmers adopt the desire best practices.

A comic booklet outlining the 10 best practices in a story line format was also developed, tested and reproduced. A “model sustainable behavior” (McKenzie-Mohr 1999) farmer is the main character of the story line. 

Farmers with their newly acquired solar shocks and grass seeds
5.3 Acquiring Political Support

One of the tougher objectives “to garner political support for the protection of the CTWS” and possibly resolve issues regarding illegal infrastructure development across the one of the lagoons in the wetland, was not met with the same success as other community related objectives. This was due to a complicated set of occurrences during the campaign as well as a flaw in the implementation of the social marketing methodology for this audience.

During the campaign planning phase Crooked Tree Wildlife Sanctuary was faced with a major infrastructure threat- the building of an unplanned road, across a major lagoon, without proper culverts and the required environmental impact assessments (EIA). BAS quickly advocated for the halt of the project which was done, in theory, by the Ministry of Natural Resources. However, the fact that the developer in this case, was the newly elected area representative Hon. Edmund Castro backed up by the community, complicated and added much contention to the situation. This halt made residents of Crooked Tree Village very upset and antagonistic towards the Belize Audubon Society as the road represented open access to “fertile” land and an increase in potential developments for cattle farming. Their antagonism arose because they claimed that the organization did not care about people and was against development of Crooked Tree Village therefore should be “put out” by the community. BAS tried to explain its position of sustainable development to the community through a community meeting, while the forest department tried to explain the importance of keeping the rules and laws of the country. The community however was not satisfied with the explanations and left with much resentment and anger, refusing to halt the project. During the debate on the road, the Minister requested an environmental clearance for the project from the department of the environment (DOE) which was granted after a rapid assessment. However, May 2008’s tropical storm Arthur (first tropical storm to form during this month since 1981) came with massive amounts of rain quickly filling the Western Lagoon of CTWS and halting the entire road project.

Considering the new threat and the antagonistic mood of an already “though to work with” community, the wetlands pride campaign plan was brought back to the drawing board and re-worked. This time focusing attention on raising the awareness of the importance of this wetland system and the harm that unplanned developments (including cattle farming) can cause to the system. The campaign was implemented carefully and activities were always implemented with much sensitivity. The success of the campaign, using the social marketing process at the community proved to increase knowledge about wetlands, raise positive attitudes towards the wetland and even change some behaviors towards the wetlands (as demonstrated in the results section).

The campaign however was not as successful in influencing the attitudes and actions of national leaders in particular the area representative Hon. Edmund Castro. This is mainly because Interpersonal communication (the third step in changing behavior) was not done effectively. Though the activity designed to bring about interpersonal communication between leaders was conducted through the implementation of the wetlands day activity, it did not yield the expected results. The leaders were present at the event however the interpersonal communication to be held during the wetlands boat
trip did not occur because the main leader Hon. Edmund Castro did not engage in the boat trip activity. This was because when he was about to get on board a group of community people pulled him to one side and entertained him. This occurrence was not anticipated and therefore there was no attempt by the campaign manager (CM) or the rest of the campaign BAS leaders to engage him and ensure his participation. Moreover the CM was busy with logistics of the activity and overlooked ways in which she could have prepared other campaign team members to bring about interpersonal communication with the minister.

Judging from the attitude and comments of the minister during the wetlands day ceremony it was evident that he had some knowledge of the wetlands of Crooked Tree, its benefits and importance of the area. His participation and willingness to give a speech on that “conservation” day demonstrated a shift in attitude towards, at the least, considering the environment and wetlands as an important aspect of development. However, the interpersonal communication (IC) needed to start considering suitable development in its true sense was lacking. With IC lacking barriers to behavior change could not be easily identified or addressed. Without addressing barriers, behavior change is difficult resulting in an incomplete implementation of the social marketing process. Though CM noted the need for IC to occur between BAS and the minister, it was beyond the role of the CM, and CM was unsuccessful in influencing the right people to initiate the necessary IC.

The road is presently still lacking the required culverts; it is eroding and inaccessible during the rainy season.

### Conclusion

**Changing the behaviors of people in the area confirmed to be as difficult as many of the social marketing authors have extensively written about. It is difficult but certainly not impossible.** The strategic method of applying commercial marketing technologies to the analysis, planning, execution and evaluation of programs can influence the voluntary behavior of audiences to improve the environment. This project attempted to use this method to raise pride and awareness on the importance of the wetlands and to establish a practical and adoptable set of cattle farming guidelines that will guide cattle farming developments near the crooked tree wetlands which will contribute to protecting the integrity of the Crooked Tree Wildlife Sanctuary.

The program, through its team approach in the careful planning and implementation seemed to have succeeded and made a difference in several areas. It succeeded in raising the targeted 20% increase in awareness of CTWS wetlands. It seems to have succeeded in achieving its targeted 15% increase in positive attitudes towards the wetlands. Considering the community hostility toward BAS at the beginning of the project (due to the road conflict) the project really helped in improving the communication between BAS and the community giving BAS the opportunity to clarify its position and emphasize on the importance of protected the CTWS. Today, BAS staff members are well received in the community and sought to answer questions on environmental issues. With the conflict and disrespect aside, there was much that could be accomplished in a more peaceful environment. The opportunity then was taken by re-activating the Local Advisory
Council that will continue communication beyond the campaign time frame. Participation and active involvement of community people itself was seen as an important behavior change achieved. Furthermore the campaign succeeded in developing the practical and adoptable set of cattle farming guidelines in consultation with farmers and agricultural agencies. Most importantly, a trend towards cattle farming best practices that is both profitable and sensitive to the CTWS wetland has been established. Ten prominent farmers signed mini contracts to move towards adopting 5 of the best practices and two farmers were already implementing these practices at the end of the campaign.

The campaign signaled and emphasized the need for water quality monitoring, bird monitoring, land clearing and land use monitoring. One set of water quality monitoring was conducted by BAS and the Department of Environment (see results in Annex 9). Land clearing and land use monitoring was continued through flights over the wetland.

Though there were many successes and positive outcomes, there were also challenges and unachieved objectives. The biogas digester pilot project did not produce the desired results. Though it is a successful technology, the campaign was not successful in convincing the farmer who tried the technology to continue the project. There were several factors influencing the ‘Action’ stage including missed or weak implementation of activities fulfilling previous stages of behavior change for this particular farmer. However there has been interest from other farmers to pilot a biogas digester. The desired target of 25% of farmers to adapt at least five best practices was not fully achieved within the time frame of the campaign; nevertheless there is some progress towards that trend.

Keeping cattle contained and away from the wetlands of CTWS requires more than just education, pride and assistance with equipment. It also requires consistent enforcement of both the Sanctuary’s laws as well as the cattle trespassing laws. It is important that law enforcement officials from the Agriculture and Forest Department support rangers and local police when farmers are being warned and or arrested. And that the on-the-ground enforcers (rangers and police) are familiar with the enforcement procedure in order to consistently enforce the law. In addition it is essential that there is strong scientific evidence, to share with the community, indicating that cattle’s roaming in the wetland is a serious threat. It would make it easier to convince farmers and local community with sound evidence. Water quality monitoring, plant species diversity, bird monitoring and continued hydrologic monitoring can all yield evidence to the degree of the threats.

Aside from the project results the implementation of this project was a very good learning experience for BAS. It strengthened its education program in its challenges of effectively implementing and measuring its impact. The KAP survey and the social marketing methodology will certainly be added to BAS’ range of implementing tools.
Reference


National Report on Protected Areas, Belize, March 2003

Pinelo, John Anthony. *A critical analysis of the management constraints within the National Parks*


ANNEX 1

Crooked Tree Pride Campaign – Pre-Campaign Survey Instrument

Crooked Tree Wildlife Sanctuary Survey for Education Campaign

Date: ________________
Interviewer name: ________________
Supervisor: ________________
Name of area: ______

[ ] Crooked Tree Village [ ] Biscayne [ ] Lemonal [ ] Gardenia [ ] Belize City

Gender of respondent: (DO NOT READ OUT THIS QUESTION). [ ] Male [ ] Female

Hello, my name is__________________________, We are conducting a survey of people in this area about the natural environment. We would very much appreciate your participation in this survey by answering a few questions. Whatever information you provide will be kept strictly confidential and will not be shown to or shared with any other person except for those people who are working on the survey. Your answers will help us to plan environmental education programs. Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, your views are important to us and I hope you will participate.

(1) May I begin the interview now?
[ ] Yes [ ] No [ ] no response

(2) Which age group are you in (CHECK ONE ONLY)?
[ ] <15 [ ] 15-19 [ ] 20-24 [ ] 25-29 [ ] 30-34
[ ] 35-39 [ ] 40-44 [ ] 45-49 [ ] 50-54 [ ] 55-59
[ ] 60-64 [ ] 65-69 [ ] >69

(3) How much schooling have you completed? (CHECK ONE ONLY).
[ ] No formal school [ ] Some primary school, but primary not completed [ ] Primary school completed
[ ] Some secondary school, but secondary not completed [ ] Secondary school completed
[ ] sixth form or more [ ] Vocational School

(4) If you belong to a religious denomination, which of the following do you belong to? (CHECK ONE ONLY, DO NOT READ OUT THE OPTIONS UNLESS NECESSARY).
[ ] Adventist [ ] Catholic [ ] Baptist [ ] Nazarene [ ] Jehovah Witness [ ] Pentecost
[ ] Wesleyan [ ] None[ ] Other ____________________

(5) What is your main occupation? (CHECK ONE ONLY, DO NOT READ OUT OPTIONS)
(A) Agriculture  [ ] Fishing  [ ] Cattle rearing  [ ] Hunting
[ ] Trade  [ ] Housewife

[ ] Logging  [ ] Student  [ ] Not employed  [ ] Hotelaire
[ ] Teacher  [ ] Entrepreneur

[ ] Tour Guide  [ ] Other ___________________

(6) People hear information about the environment from many
different sources. I'm going to read you a list of sources from which
you might obtain information about the environment. (CHECK ONE
ONLY FOR EACH QUESTION)

(A) Persons on the radio-do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(B) Person on television-do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(C) Report in newspaper or magazine- do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(D) Law enforcement official - do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(E) Local community leaders such as a politician, village chair man-
do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(F) Local community leaders such as religious leaders- do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(G) Government staff that deal with the environment - do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(H) Environmental NGO staff- do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(I) Friends or family members- do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(J) Teachers do you?
[ ] Trust them  [ ] Somewhat Trust  [ ] Do not Trust them  [ ]
Don't Know

(7) How frequently do you watch the following TV stations? (CHECK
ONLY ONE)

(A) Channel 5  [ ] Never  [ ] Less than 1 day a week  [ ] 1-
3 days per week  [ ] 4-6 days per week
[ ] 7 days per week
(B) Channel 7 [ ] Never [ ] Less than 1 day a week [ ] 1-3 days per week [ ] 4-6 days per week

[ ] 7 days per week

(C) Love TV [ ] Never [ ] Less than 1 day a week [ ] 1-3 days per week [ ] 4-6 days per week

[ ] 7 days per week

(D) Plus TV [ ] Never [ ] Less than 1 day a week [ ] 1-3 days per week [ ] 4-6 days per week

[ ] 7 days per week

(E) Is there any other local TV that you watch ____________________?

[ ] Never [ ] Less than 1 day a week [ ] 1-3 days per week [ ] 4-6 days per week

[ ] 7 days per week

(10) Do you know of any non-government environmental organization who works in this area? If so which one (IF ANSWER IS NO, DO NOT ASK QUESTION 11 (A))

[ ] Says Belize Audubon Society [ ] Did not say Belize Audubon Society

(A) What do they do in your area?____________________

(11) What type of habitat (land) do think this is? (SHOW PICTURE OF A WETLAND ECOSYSTEM)

[ ] Said wetland [ ] did not say wetland [ ] No response [ ] Don't know

(12) Do you know the name of a protected area in the north of the country that protects a wetland habitat? (IF NO GO TO QUESTION 16) [ ] Gave correct answer [ ] Gave incorrect answer [ ] Not sure/ no response

(13) Do you think you benefit from this protected area in any way? (IF ANSWER IS NO GO TO QUESTION 15)
(14) How do you benefit? (DO NOT READ OUT OR CHECK OPTIONS,
WRITE EXACT
RESPONSES) ____________________________________________
_________________________________________________________
_________________________________________________________
[ ] Tourism related activities and benefits [ ] Environmental
Benefits [ ] Education and training
[ ] Other __________________

(15) In your own words, what do you understand by the word
"wetlands"? (WRITE OUT THE ANSWER OF RESPONDENT, DO NOT
CHECK OPTIONS)
__________________________________________________________
__________________________________________________________
[ ] has the basic concept [ ] understands completely [ ]
does not understand [ ] said they don’t know

(16) In your view what does the wetland habitat do for you? List as
many as you can think of. (DO NOT READ OUT OPTIONS, CAN
CHECK MORE THAN ONE)

[ ] No threat [ ] Net Fishing [ ] Cattle farming [ ] Agriculture [ ]
Unsustainable Tourism Dev.
[ ] Wildlife Harassment [ ] Hunting [ ] Water Pollution [ ]
Don’t Know [ ] Other __________________

(17) Do you think that the wetlands of Crooked Tree Wildlife
Sanctuary is threatened by anything? If yes, by what? (DO NOT
READ OPTIONS, CAN CHECK MORE THAN ONE)

[ ] No threat [ ] Net Fishing [ ] Cattle farming [ ] Agriculture [ ]
Unsustainable Tourism Dev.
[ ] Wildlife Harassment [ ] Hunting [ ] Water Pollution [ ]
Don’t Know [ ] Other __________________

(18) Are you aware of the rules regarding the Crooked Tree Wildlife
Sanctuary?

[ ] Yes [ ] No [ ] no response

(19) If a person conducts tours in wetlands of Crooked Tree to
generate income is this considered:

[ ] Legal [ ] Illegal [ ] Don’t know

(20) If a person shoots a Jabiru Stork, is this considered?

[ ] Legal [ ] Illegal [ ] Don’t know

(21) If a person uses line to fish inside the wetland of crooked tree
is this:

[ ] Legal [ ] Illegal [ ] Don’t know

(22) If a person hunts inside or near to the wetlands of Crooked
Tree is this considered:

[ ] Legal [ ] Illegal [ ] Don’t know
If a person uses nets to fish inside the wetlands of Crooked Tree is this considered:

[ ] Legal          [ ] Illegal          [ ] Don't know

To your knowledge, what is the fishing agreement with the community to regulate fishing in the Crooked Tree wetlands? (WRITE EXACT RESPONSES)

Which of the following would you consider as "traditional way of fishing" in the wetlands of Crooked Tree? (CAN CHECK MORE THAN ONE)

[ ] Net fishing          [ ] Cast net fishing          [ ] Line fishing          [ ] Pot fishing          [ ] Spear gun fishing          [ ] None          [ ] Don't Know          [ ] Other

Which of the following methods of fishing can be done in the wetlands of Crooked Tree? (CAN CHECK MORE THAN ONE)

[ ] Net fishing          [ ] Cast net fishing          [ ] Line fishing          [ ] Pot fishing          [ ] Spear gun fishing          [ ] None          [ ] Don't Know          [ ] Other

Who regulates the fishing activity in the Crooked Tree Wildlife Sanctuary? (CAN CHECK MORE THAN ONE)


Who do you think SHOULD regulate the fishing activity in Crooked Tree Wildlife Sanctuary? (CAN CHECK MORE THAN ONE)


Please tell me whether you strongly agree, are neutral, disagree or strongly disagree with the following statements. (CHECK ONLY ONE)

(A) Crooked Tree wetlands controls flooding for Belize City and other surrounding villages. [ ] Strongly Agree          [ ] Agree          [ ] Neutral          [ ] Disagree          [ ] Strongly Disagree          [ ] Don't Know

(B) The wetlands of CTWS are waste lands and should be filled and developed.

[ ] Strongly Agree          [ ] Agree          [ ] Neutral          [ ] Disagree          [ ] Strongly Disagree          [ ] Don't Know

(C) The Jabiru and other wetland birds depend on the health of the wetlands. [ ] Strongly Agree          [ ] Agree          [ ] Neutral          [ ] Disagree          [ ] Strongly Disagree          [ ] Don't Know

(D) Tilapia is a local wetland fish.

[ ] Strongly Agree          [ ] Agree          [ ] Neutral          [ ] Disagree          [ ] Strongly Disagree          [ ] Don't Know

(E) Cattle dung and other agricultural waste affect the health of the wetland ecosystem. [ ] Strongly Agree          [ ] Agree          [ ] Neutral          [ ] Disagree          [ ] Strongly Disagree          [ ] Don't Know

(F) Net fishing negatively affects wetland birds. [ ] Strongly Agree          [ ] Agree          [ ] Neutral          [ ] Disagree          [ ] Strongly Disagree          [ ] Don't Know
(G) Net fishing is necessary to avoid the smell of dead fish in the dry season.  
[ ] Strongly Agree  [ ] Agree  [ ] Neutral  [ ] Disagree  [ ] Strongly Disagree  [ ] Don't Know

(30) I'm going to read you a list of statements about activities. For each, I would like you to tell me how important these are to you.  
(CHECK ONE ONLY)

(A) Wetlands?  
[ ] Very important  [ ] Somewhat important  [ ] Not important  [ ] Don't know

(B) Crooked Tree Wildlife Sanctuary?  
[ ] Very important  [ ] Somewhat important  [ ] Not important  [ ] Don't know

(C) Birds?  
[ ] Very important  [ ] Somewhat important  [ ] Not important  [ ] Don't know

(D) net-fishing within Crooked Tree wetlands.  
[ ] Very important  [ ] Somewhat important  [ ] Not important  [ ] Don't know

(E) Tilapia?  
[ ] Very important  [ ] Somewhat important  [ ] Not important  [ ] Don't know

(F) Bay Snook?  
[ ] Very important  [ ] Somewhat important  [ ] Not important  [ ] Don't know

(G) Stopping agricultural by products such as cattle dung, pesticides and fertilizers from entering into the wetland system.  
[ ] Very important  [ ] Somewhat important  [ ] Not important  [ ] Don't know

(H) Stopping garbage from entering into the wetland system.  
[ ] Very important  [ ] Somewhat important  [ ] Not important  [ ] Don't know

(31) Please tell me whether you would find the following activities easy, difficult or are not sure for you to do  
(CHECK ONE ONLY)

(A) Report a person from your village that you know illegally net fishes in Crooked Tree Wildlife Sanctuary  
[ ] Easy  [ ] Difficult  [ ] Not sure/Don't know

(B) Report a person from outside your community that illegally conducts net fishing.  
[ ] Easy  [ ] Difficult  [ ] Not sure/Don't know

(C) Report a person that is hunting with in the Crooked Tree Wildlife Sanctuary:  
[ ] Easy  [ ] Difficult  [ ] Not sure/Don't know

(D) Stop throwing garbage in wetlands  
[ ] Easy  [ ] Difficult  [ ] Not sure/Don't know

(E) Stop net fishing in the Crooked Tree Wildlife Sanctuary  
[ ] Easy  [ ] Difficult  [ ] Not sure/Don't know

(F) Stop agricultural waste products such as fertilizers, pesticides, and cattle manure from entering the wetland system?  
[ ] Easy  [ ] Difficult  [ ] Not sure/Don't know
Why do you think people fish in the wetlands of Crooked Tree without following the law? (CAN CHECK MORE THAN ONE).

[ ] Don't know the regulations [ ] Don't Agree with the law [ ] Need Food to eat [ ] Need extra money

[ ] Other fish are too far away [ ] There is too much fish [ ] No response [ ] Other ________________

If a song was to be done on the wetlands or animals of CTWS, which of these artist would you prefer listening to the most? (CHECK ONLY ONE)

[ ] Lee Iaa Vernon [ ] Reacie Pollard [ ] Mr. Peters/ D. J. Morgan [ ] Supa G [ ] Andy Palacio

[ ] Lord Rhaburn [ ] Other ________________

In the last six months have you spoken to anyone about the environment? (CHECK ONLY ONE)

[ ] Yes [ ] No [ ] Uncertain

In the last six months through which of the following ways have you heard about wetlands:

(A) On a billboard [ ] Yes [ ] No [ ] Uncertain

(B) On a poster [ ] Yes [ ] No [ ] Uncertain

(C) On a radio [ ] Yes [ ] No [ ] Uncertain

(D) In a newspaper [ ] Yes [ ] No [ ] Uncertain

(E) On a fact sheet [ ] Yes [ ] No [ ] Uncertain

(F) On a leaflet [ ] Yes [ ] No [ ] Uncertain

(G) In a song [ ] Yes [ ] No [ ] Uncertain

(H) Through a Puppet show? [ ] Yes [ ] No [ ] Uncertain

(I) In a video show [ ] Yes [ ] No [ ] Uncertain

(J) In a story [ ] Yes [ ] No [ ] Uncertain

Which of these animals makes you feel the most proud? (CHECK ONE ONLY. SHOW THE PICTURES)

[ ] Hicatee [ ] Bay Snook [ ] Jabiru Stork [ ] Yellow Headed Parrot [ ] None

[ ] Other __________

We have come to the end of this survey. I will place it in my folder where it will be reviewed only by people entering the data into the computer. Thank you very much for your participation and have a nice evening.
ANNEX 2

Teacher’s Summer Camp Agenda

DAY ONE

9:00- Prayer and Song- by BAS staff
9:15- Welcome and Introduction teachers
9:45- Ice Breaker-
10:00- Background and introduction of the workshop
10:20- BREAK
10:30- Natural Resources
    o renewable and none renewable)
    o Ecosystems and their function
    o Group activity (ways to teach about this topic, materials for Teacher’s Tool kit)
12:00- LUNCH
1:00- Ice Breaker: Fishing for me
1:30- Conservation, Sustainable Development and Protection
    o protected areas in Belize
    o 2:30- Group Activity (ways to teach about this topic, materials for Teacher’s Tool kit)
3:00- Visual and performing art in environmental education
    (Intro to puppet and mask making)
3:45- Afternoon chat.

DAY TWO

9:00- Prayer and Song- By Biscayne teachers
9:15- Ice Breaker: Broken Squares
9:45- Introduction of the day
10:00- Forest department
    o Manager and law enforcement for protected areas
    o What is a Ramsar Site?
10:40- BREAK
10:50- Water, Watersheds and Wetlands
12:00- LUNCH
1:00- A closer look at Crooked Tree Wetlands
    o Hydrology of CTWS
    o Flora and Fauna
    o What threatens it?
2:00- visual and performing art in environmental education (Script Writing and model making)

DAY THREE

9:00- Prayer and Song (By Crooked Tree teachers)
9:15- Ice Breaker
9:45- Introduction of the day
10:00-Endangered Animals
  ● What are endangered Animals?
  ● Endangered animals in Belize
  ● Why are they endangered?
10:40- BREAK
10:50- Water, Watersheds and Wetlands (continued)
12:00- LUNCH
1:00- Prepare for trip
1:30- Leave for CBWS

DAY FOUR
7:00- Break Fast
8:00- Introduction to CBWS and how it is linked to CTWS
8:30- Hike up to see the mountainous range
  Forest interpretations, importance of plants in a forest and in the watershed
  Waterfalls talk- where does the water that ends up in a wetland come from?
  -What role does a waterfall play in the watershed?
12:30- Lunch
2:30- Leave from CBWS
ANNEX 3

Teacher’s Summer Camp Written Evaluations

1. The best part of the training was the opening to the presentation and importance of our wetlands.
2. The worst part of training was the food aspect.
3. What struck you the most and why? The importance of Corked Tee’s wetlands to the country without it, many other places would be flooded now严重ly.
4. What materials and resources you could use in the classroom. I would use the activities based on wetlands and the information provided to help educate my children in the classroom.
5. I enjoyed the workshop very much. I learned a lot of new things.
6. The teachers were very important, but not as I thought.
7. I learned some new facts and my knowledge has grown.
8. The information and presentation were definitely an eye-opener for me. Now I can understand why wetlands are important, they serve a good ecological purpose. Do you think the presentations long and the food wasn’t up to my standards. Other than that everything was O.K.
9. I have a new respect for Corked Tee’s wetlands. I would like to find ways how we could impart this knowledge to them.

Great job, Mrs. Oliveira.

1. The best part of the training was the different activities done and also the amount of new found information that I didn’t know before. I now learn to appreciate my environment more and also teach students to do the same.
2. The worst part was the long presentations done by the Foresty Dept. The presentations could have been a little shorter but it was also informative but a little too long.
3. What struck me the most was the different activities done to show the importance of Corked Tee’s wetlands to the animals, birds and people. These were really good activities especially the one on the water and the importance of the village to the water source.
4. Materials and Resources I can use in my classroom is all of them. These are materials that are easily found and I know that students can find them easily and I know that they will love doing them.
5. This is one workshop I have really enjoyed. It was very educational and informative. I now have a better idea about Corked Tee’s wetlands and I appreciate it more. The workshop brought many new points and she did a very good job. I would love to do another workshop like this.
ANNEX 4

Full report on Cattle Farmers One-on-One visits

Prepared by: Orlando Jimenez, BAS community liaison officer

Introduction:

Fifty cattle farmers were visited to gather information of cattle activities in and around the Crooked Tree Wildlife Sanctuary. These farmers are from the buffer communities of the Sanctuary: Lemonal, Biscayne, Gardenia, Maypen and Crooked Tree. Most of the farmers are above 40 years and the oldest being 89 years. One of the farmers is in the early twenties. Two women are cattle farmer but the activity is a family business which means that the entire household is involved. From the cattle farmers interviewed two are part time butchers that retail meat.

Methodology:

The community Liaison Officer CLO and the park Wardens visited individual cattle farmers to obtain cattle activities and practices. This was done after midday when most of the farmers are home.

Constraints in gathering information:

Despite being tired cattle farmers visited were anxious to speak to the team. They spoke of all activities in their farm including crops and vegetable production. They even spoke about history of themselves and also that the agriculture extension service was poor as compared to earlier years. They spoke about the promises of the politicians and the tilapia fish activities. It was easy to obtain information but the farmers had to be steered and prompted with questions. One of the temptations that the park wardens could not resist was to answer some of the questions for the farmer which time and again they had to be reminded that it was necessary that the farmer answer, even if we knew the answer to the questions. The park wardens were fearful that the questions would be too direct and receive wrong answers. It is true that the farmers will never give the correct figure but the numbers of heads owned and reported are accurate and may not be exact. The purpose of the survey nonetheless was to determine what the farmers did, what was their approach and feelings towards what they did and whether they thought there was room for improvement.

The Wetlands around Crooked Tree Village is immense extending from the Coast to the New River Lagoon to the Belize Old River. Cattle ranching around and in the wetlands have been an activity for many years and extending as more land is cleared or the present pine ridge savannahs are used. In 1984 after the wetlands around and in the vicinity of Crooked Tree Village was declared a Wildlife Sanctuary efforts to convince the cattle
ranchers to move away from the traditional system of open range cattle farming was done. The government got involved and the village council was active in requesting the containment of free roaming animals. A few farmers fenced their animals but the majority remained adamant in their ways. No enforcement of the law to remove these animals from the public areas was contemplated.

As a result of free roaming animals, there is limited control of what happens with the livestock. Their have been losses of animals attributed to the jaguar predation, cattle rustling, breached parturition and others. Farmers have not ascribed any losses to malnutrition, parasite infestations, drought, mothering ability of cows or much less to infertility of bulls or mother or their inadequate management practices.

**Jaguar Predation:**

From the farmers surveyed three have indeed suffered from jaguar predation whilst others have seen a jaguar going through the farm and on two occasions got rid of it indiscriminately. The others that claim that jaguars had molested them have no evidence since their animals are in the wild and when carcasses are found cause of death cannot be verified.

Farmers do not house or pen their animals and the corals used are provisional and not adequately built or secure enough. For those farmers that have fences, the forest is along the fence and jaguars easily hide and wait for the killing opportunity. Jaguar attacks are mostly during the dry season and slows down during the rainy season.

**Cattle Rustling:**

Farmers in the Lemonal Village claim that they have lost animals due to cattle rustling. They have seen the rustlers that come from Hattie Ville Village. These people would rope the animals and slaughter them on site. The amount lost has not been verified. The problem of proper animal identification is a constraint since many of the farmers do not brand animals even when they have registered brands. This means that they cannot claim ownership of the animals since they have no proof.

**Breach Parturition and death rates:**

Since farmers do not keep records, most do not know when their animals are pregnant and cannot account for losses due to death of calves. Farmers are not present during calving to assist and sometimes the mothers die or both animals die. The high infestation of parasites and poor milk production also takes its tax on the calves. Animals are born as low as 40 lbs birth weight for many reasons of which the improper management is the highest culprit.
Animal Breeding:

Most farmers agree that they need a better bull and agree that it is necessary to avoid inbreeding. Dominant breeds are the Brahma, Beef Master, Belgian Blue, Nelore. All the farmers are into beef production and not into milk production. They are aware of inbreeding possibilities and take steps to reduce this. Those that have animals in the range however, have no control of this and do not know who sires who. This has resulted in degeneration of stock genetics.

Parasite Control:

Visiting cattle farmers in the buffer communities of the Wildlife Sanctuary indicated that all farmers used wormers and vitamins for their animals. Ticks and beef worms are the most prevalent ecto-parasite and parasitic worms are the endo-parasites. Ivomectin broad-spectrum anthelmintic is administered to bovine and equine to control both internal and external parasites. The treatment is ineffective as cattle ingest eggs or larvae of parasites and become re-infected over and over again. Farmers that have fencing but do not have subdivisions have the same problems. Vitamins ADE are used but still conditions of these animals remain poor as a result of parasites infestations coupled with insufficient feed.

Animals Feed:

Farmers normally allow animals to graze freely on natural pastures. There is a slow move to establishing improved grasses but pastures are properly managed. Common grasses planted by farmers are Brachiaria humidicola, Brachiaria brizantha, Sparrow grass and Mombassa. A new variety is been imported and is expensive. Grass Seeds planted per acre ranges between four and six pounds depending on the method of planting or broadcasting. Farmers have indicated that B. humidicola does well in the wetlands but cannot withstand the grazing. This can be attributed to overstocking and poor pasture rotation.

Some of the farmers have planted cane and elephant grass to help them through the dry season. These are cut and chopped up and fed to the cattle. Molasses was used at one time but the rise in cost has discouraged this practice. A few farmers use malt but not often. Malt is one of the ingredients used in beer making. The supplemental feeding is not done routinely.

To mitigate the feed problem all farmers release their animals to roam wherever.
Animal Waste:

Animals are free roaming and are all over the wetlands particularly during the dry season. The impact of defecation and urine in water runoffs is visible on the water flora as more aquatic weeds are seen covering more of the water’s surface. Although it is said that because the waste are not concentrated the plants use up the nutrients it is no certain how much runs off into the waterways or how much nutrient percolate to the water table.

Marketing:

Whenever it is necessary to sell an animal the farmers would follow the livestock into the pine ridge and shoot the one they need and sell it in quarters. The price they obtain per lb is 2.50 slaughtered weights. They deliver the entire carcass with the exception of the hide, head and intestines. The feet, instrals and even the tongue are taken. Live weight the farmers receive from a range of $1.30 to $1.60 per pound of animal. The farmers are satisfied with the price and claim that they still make forty percent profit. There are three major problems faced in marketing:

1. The animals are not weighed usually and are sold by visual calculations or the use of the girth measurement method. The girth measurement is accurate if used properly but usually the buyer pulls the tape tightly to give a wrong reading.
2. Animals cannot be sold easily due to the poor conditions of the animal. Animals in good condition dress into a higher percentage than animals of poor conditions.
3. The marketer takes animals on credit and takes long to pay. Butchers pay by installments which is discouraging to the farmers.

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<td>Cattle</td>
<td>12 &amp; Diamond 3</td>
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<td>20</td>
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<td>Name</td>
<td>Animal</td>
<td>Quantity</td>
<td>Zip Code</td>
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<td>Thomas Anthony</td>
<td>Cattle</td>
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<td>15</td>
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<td>Lloyd (Striker) Wade</td>
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<td>19</td>
<td>60 Biscayne Butcher</td>
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<td>Cattle</td>
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<td>119</td>
<td>45 Biscayne</td>
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<td>(Melanie Gideon Vernon)</td>
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<td>220-1175 (has cleared 120 acres and has applied for 200)</td>
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<td>Leopold Segura</td>
<td>Cattle</td>
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<td>25</td>
<td>- Biscayne Trucking of fuel</td>
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<td>35</td>
<td>Alfred Dawson</td>
<td>Cattle</td>
<td>AD</td>
<td>14</td>
<td>120 Biscayne</td>
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<td></td>
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<td>sheep</td>
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<td></td>
<td>Alden and Alfred are brothers they may be reporting the same animals</td>
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<tr>
<td>36</td>
<td>Alden Dawson</td>
<td>Cattle</td>
<td>AD</td>
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<tr>
<td>37</td>
<td>Alberto Morales</td>
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<td>Charlie Wade</td>
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<td>Faber</td>
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<td>44</td>
<td>Olive Dawson</td>
<td>Cattle</td>
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<tr>
<td>45</td>
<td>Ena Tillet</td>
<td>Cattle</td>
<td></td>
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<tr>
<td>46</td>
<td>Clifford (Bunting) Moody</td>
<td>Cattle</td>
<td>CM and Diamond E</td>
<td>Maypen</td>
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<tr>
<td>47</td>
<td>Denton Moody</td>
<td>Cattle</td>
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<tr>
<td>48</td>
<td>Dull Vacario</td>
<td>Cattle</td>
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<tr>
<td>49</td>
<td>Joyce Reyes</td>
<td>Cattle</td>
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<tr>
<td>50</td>
<td>Charles Moody</td>
<td>Cattle</td>
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</table>

Gillett Estate, Crooked Tree, 810 acres
ANNEX 5

Wetland Song Lyrics

Crooked Tree Wetlands ga wi baak as wi develop mek keep it like that
Dat the biggest inland wetland dah Belize
Y filta water from pollution and slow down this flood tension
And dah home fi wildlife, fish birds and human’s

Crooked Tree Wildlife Sanctuary dah home fu the elegant Jabiru
And over 300 kinda birds live there too
Exotic birds come from near and far
And this lovely paradise they are here
So we should protect this lovely place my dear

All ah unhu Farmers I am calling your attention: be careful of how you chop down the trees It could cause a lot of devastation so please leave 300ft around the wetlands

Crooked Tree Wetlands ga wi baak as wi develop mek keep it like that
Dat the biggest inland wetland dah Belize
Y filta water from pollution and slow down this flood tension
And dah home fi wildlife, fish birds and human’s

Crooked Tree Wildlife Sanctuary dah home fu the elegant Jabiru
And over 300 kinda birds live there too
Exotic birds come from near and far
And this lovely paradise they are here
So we should protect this lovely place my dear

This Sanctuary provides us with healthy water fish and vegetation!
Remember dah also a tourist attraction and dah play ground for our children for many generation.
Thank You!
Belize Defence Force

For contributing to the Conservation of Crooked Tree Wildlife Sanctuary and community involvement.
August 2008

Our Wetlands from a Bird's Eye View

Thank You!

With sincere appreciation for your time and dedication towards conservation of Belize’s Wetlands.
**Annex 7**

**KEY TO THREAT CRITERIA (Based on Miradi definitions)**

**A: SCOPE (Area)**

4 = **Very High:** The threat is likely to be very widespread across all or much of your site.

3 = **High:** The threat is likely to be widespread in its scope, and affect conservation targets at many locations at your site.

2 = **Medium:** The threat is likely to be localized in its scope, and affect the conservation target at some of the target’s locations at the site.

1 = **Low:** The threat is likely to be very localized in its scope, and affect the conservation target at a limited portion of the target’s location at the site.

**B: SEVERITY** – The level of damage to the conservation target that can reasonably be expected under current circumstances (i.e., given the continuation of the existing situation).

4 = **Very High:** The threat is likely to destroy or eliminate the conservation target over some portion of the target’s occurrence at the site.

3 = **High:** The threat is likely to seriously degrade the conservation target over some portion of the target’s occurrence at the site.

2 = **Medium:** The threat is likely to moderately degrade the conservation target over some portion of the target’s occurrence at the site.

1 = **Low:** The threat is likely to only slightly impair the conservation target over some portion of the target’s occurrence at the site.

**C: IRREVERSIBILITY** – The importance of taking immediate action to counter the threat.

4 = **Very High:** The effects of the direct threat are not reversible (e.g., wetlands converted to a shopping center).

3 = **High:** The effects of the direct threat are reversible, but not practically affordable (e.g., wetland converted to agriculture).

2 = **Medium:** The effects of the direct threat are reversible with a reasonable commitment of resources (e.g., ditching and draining of wetland).

1 = **Low:** The effects of the direct threat are easily reversible at relatively low cost (e.g., off-road vehicles trespassing in wetland).
**Annex 8**

**KEY TO ABILITY TO INFLUENCE THE THREAT**

**A: Organizational ability:** Does your group (or a partner) have the technical competencies and/or resources to address this threat. Does it have experience with the issue at hand?

4 = **Very High:** Organization (or partner) has the technical competences and resources on hand to address threat or remove barrier to threat mitigation

3 = **High:** Organization (or partner) can access the technical competences and resources to address threat or remove barrier to threat mitigation

2 = **Medium:** Organization has some technical competency and/or resources to address threat or remove barrier to threat mitigation

1 = **Low:** No competency or resources available

**B: Social practicality:** What barriers need to be removed to truly mitigate the threat. How difficult will it be to remove these barriers with the resources you have at hand, recognizing the prevailing, cultural, socio-economic climate?

4 = **Very Easy:** Barriers to behavior change easy to adopt, at little cost, and minimal disruption

3 = **Easy:** Barriers to behavior change require some expense, some disruption to the “normal way of doing things”

2 = **Moderate:** Barriers to behavior change require significant sacrifice, cost, loss of profits, new learning

1 = **Difficult:** Barriers to behavior change very high. New behavior requires high cost to adopt, new skills to be learned, traditional concerns overcome

**C: Political feasibility:** How supportive might the local political environment be. (This might include government, community leadership etc)

4 = **Very Feasible:** Government or community leadership already articulated strong support

3 = **Somewhat feasible:** Government or community leadership expressed support

2 = **Unsure or unknown:** The threat probably will need to be countered in the next 5-10 years, but does not need to be dealt with before then.

1 = **Likely unfeasible:** High socio-political barriers to overcome. Government or communities unlikely to support or endorse initiative