

A photograph of a sunset over a large body of water. The sun is low on the horizon, creating a bright, golden glow that reflects on the water's surface. The sky is filled with soft, orange and yellow clouds. In the foreground, there is a dark, silhouetted line of reeds or marsh grasses. The overall mood is peaceful and natural.

Planning for Community Management of Crooked Tree Wildlife Sanctuary

A COMMUNITY VISION

Crooked Tree is a community-driven Wildlife Sanctuary that balances responsible stewardship of the wetland and other natural resources with sustainable use, based on traditional practices, securing benefits for current and future generations

PLANNING FOR COMMUNITY-DRIVEN MANAGEMENT OF CROOKED TREE WILDLIFE SANCTUARY

This document summarizes the outputs of five workshops held in the Crooked Tree community between October and December, 2018, to plan for future management of the Crooked Tree Wildlife Sanctuary.

- Workshop 1: Defining the Vision, Selecting Targets and Assessing Viability
- Workshop 2: Identifying Threats, Conducting a Situation Analysis and Defining Goals
- Workshop 3: Sustainable Use Planning for the Crooked Tree Fishery
- Workshop 4: Developing Objectives and Identifying Strategies
- Workshop 5: Reviewing the Outputs, Identifying Indicators to Measure Success

A final workshop on the 15th December, 2018, presented the outputs to the participants to ensure they reflected the outputs from the workshops.

PLANNING STEERING COMMITTEE

The planning workshops benefitted from the participation and input of members of the Crooked Tree Wildlife Sanctuary Steering Committee:

- Forest Department
- Fisheries Department
- Crooked Tree Village Council
- Belize Audubon Society
- Representatives from the Crooked Tree community

The planning workshops and management planning process were facilitated by Wildtracks

Funding was provided by the Selva Maya Programme-GIZ.



PLANNING FOR COMMUNITY-DRIVEN MANAGEMENT OF CROOKED TREE WILDLIFE SANCTUARY

SO WHY IS THIS PLANNING SO DIFFERENT?

Reason One

Crooked Tree is going to become a Wildlife Sanctuary (2)

Wildlife Sanctuaries are protected areas designated because of their importance for species or ecosystems. Crooked Tree was protected because of its large waterbird populations. However, the old legislation did not allow for fishing within the Wildlife Sanctuary area.

There has been a recent change in the protected area laws for Wildlife Sanctuaries. The new legislation, the Protected Areas System Act, allows for two types of Wildlife Sanctuary.

- **Wildlife Sanctuary (1):**
 - Designated to protect nationally significant species, biological communities or physical features.
 - Continues to be non-extractive / no-take (e.g. Cockscomb Basin Wildlife Sanctuary)
- **Wildlife Sanctuary (2):**
 - Designated to protect nationally significant species, biotic communities or physical features, and allow for traditional, sustainable extraction of natural resources
 - Allows for traditional extraction following a sustainable use plan.

Crooked Tree's designation is going to change to Wildlife Sanctuary (2), to allow for traditional fishing, based on an ***approved Sustainable Use Plan***. This last bit, the Sustainable Use Plan, is very important - this is the part that ensures that use, whether fishing or logwood extraction, will be able to continue for many generations. Does that mean anyone can fish? No! The Sustainable Use Plan will be based on the Fisheries Department Managed Access framework, which gives licenses to traditional users only from the key stakeholder communities, protecting their rights. The plan has to be approved by the Forest and Fisheries Departments.

Reason Two

The management structure will be changing

A Memorandum of Understanding has been signed by the Forest Department, Fisheries Department, Crooked Tree Village Council and Belize Audubon Society to pave the way for a new future of collaborative management for Crooked Tree Wildlife Sanctuary, with the community playing a much larger part in decision-making and implementation of the management plan, led by a Crooked Tree Management Committee.

OUR MANAGEMENT TARGETS - WHAT DO WE WANT TO PROTECT?

Participants at the community consultations identified seven management targets of the Wildlife Sanctuary that are considered important to Crooked Tree, supporting the community livelihoods through tourism, fishing and hunting across the landscape.



GOAL

To restore the health and ecosystem services of the wetlands of Crooked Tree Wildlife Sanctuary

IDENTIFIED THREATS

- Altered Water Flow
- Unsustainable fishing (including hicatee)
- Water Pollution

TARGET: PINE SAVANNA



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GOAL

To improve the condition and long term viability of the pine savanna and yellow headed parrots

IDENTIFIED THREATS

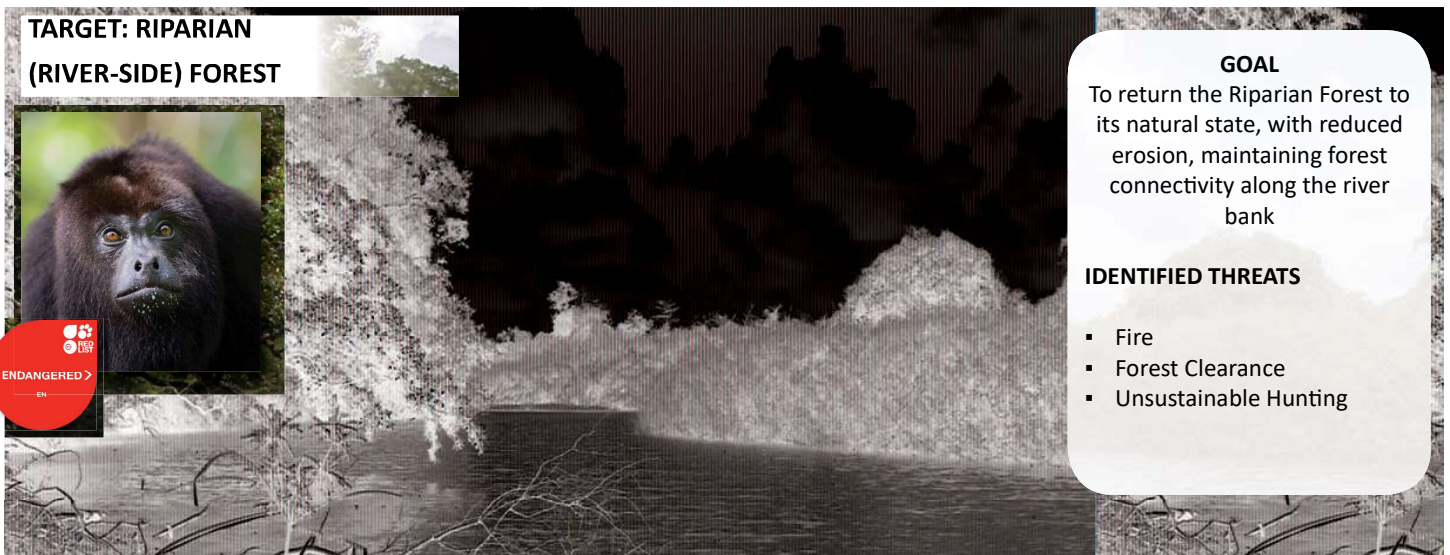
- Fire
- Forest Clearance
- Poaching of Parrot Nestlings
- Unsustainable Hunting

TARGET: RIPARIAN (RIVER-SIDE) FOREST



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GOAL


To return the Riparian Forest to its natural state, with reduced erosion, maintaining forest connectivity along the river bank

IDENTIFIED THREATS

- Fire
- Forest Clearance
- Unsustainable Hunting

At the workshops, there was general agreement that the state of the natural resources has declined over the last twenty years. If the selected targets are managed well, the state of the resources will improve - more fish, more birds, a healthier lagoon - with positive impacts on the lives of people in the community.

TARGET: TRADITIONALLY HARVESTED FISH



GOAL
To improve sustainability and long term viability of traditionally harvested fish species

IDENTIFIED THREATS

- Altered Water Flow
- Unsustainable Fishing
- Water Pollution

TARGET: GAME (HUNTED) SPECIES



GOAL
To improve sustainability and long term viability of hunted species

IDENTIFIED THREATS

- Unsustainable Hunting
- Fire
- Land Use Change for Agriculture

TARGET: LOGWOOD

GOAL
To improve the condition and long term viability of logwood and ensure that use is sustainable

IDENTIFIED THREATS

- Fire
- Unsustainable Logwood Extraction for Posts
- Altered Water Flow
- Land Use Change for Agriculture

TARGET: WATERBIRDS

GOAL
To restore numbers of waterbirds of Crooked Tree Wildlife Sanctuary to previous levels

IDENTIFIED THREATS

- Altered Water Flow
- Fire
- Unsustainable Hunting
- Unsustainable Fishing

HOW WELL ARE OUR TARGETS DOING?

Workshop participants discussed each target based on the following questions:

- Are ecosystems (pine savanna, wetlands and the river-side (riparian) forests) as healthy as they were twenty years ago?
- Have species (fish, game species, waterbirds and logwood) increased or decreased in numbers in the Crooked Tree area over the last twenty years, are they healthy and producing young?

MANAGEMENT TARGET	LANDSCAPE CONTEXT	CONDITION	SIZE	VIABILITY RATING
WETLAND	FAIR	FAIR	FAIR	FAIR
PINE SAVANNA	FAIR	FAIR	GOOD	FAIR
RIPARIAN (RIVER-SIDE) FOREST	FAIR	FAIR	FAIR	FAIR
TRADITIONALLY HARVESTED FISH SPECIES	FAIR	FAIR	FAIR	FAIR
GAME (HUNTED) SPECIES	FAIR	FAIR	FAIR	FAIR
LOGWOOD	FAIR	FAIR	FAIR	FAIR
WATERBIRDS	GOOD	GOOD	GOOD	GOOD
HEALTH OF CROOKED TREE WILDLIFE SANCTUARY				FAIR
VERY GOOD	Doing very well – doesn't need any actions to maintain the target			
GOOD	Doing OK, but will go down if no action is taken to maintain the target			
FAIR	Not doing well - decreasing and will continue to go down unless something is done. May become POOR in the next 5 years			
POOR	Almost gone – may disappear within 5 years unless something is done urgently, and even then, it may still disappear from the area			

The working group outputs showed that no target is considered to be **VERY GOOD**, and only one is thought to be **GOOD** (Waterbirds).

The remaining six targets are rated as **FAIR** (*Not doing well - decreasing and will continue to go down unless something is done*), and may even become **POOR** in the next 5 years (*Almost gone – may disappear within 5 years unless something is done urgently, and even then, it may still disappear from the area*).

The overall rating for Crooked Tree Wildlife Sanctuary is **FAIR**, but it is thought that this can be improved to **GOOD** over the next five years if the community works together to implement the management strategies and actions.



WHAT ARE THE THREATS TO OUR TARGETS?

Workshop participants discussed the threats to each management target based on the following questions:

- What is happening to the target - how is it changing? (decreasing numbers, degraded ecosystems)
- What is it that is causing these changes?

Crooked Tree Wildlife Sanctuary faces a **VERY HIGH** level of threat, with changes to the quality of the wetland, and affecting the level of benefits the wetland can provide for Crooked Tree Village and the other local communities. The highest threats (those that are affecting the targets most) are:

Altered Water Flow	Anything that blocks the water flow or changes it in some way, (e.g. the Western Causeway)
Fire	Set by farmers or hunters to encourage new grass shoots
Unsustainable Fishing	Non-traditional fishers fishing in Crooked Tree Lagoon, fishing without a license, small net mesh, taking undersized fish, fishing without a license
Unsustainable Hunting	Hunting out of season, when animals are reproducing, hunting without a license

THREAT	Wetland	Pine Savanna	Riparian (River-side) Forest	Traditional Harvested Fish	Game (Hunted) Species	Logwood	Waterbirds	Overall Threat Rank
Altered Water Flow	VERY HIGH			VERY HIGH		HIGH	HIGH	VERY HIGH
Fire	MEDIUM	VERY HIGH	VERY HIGH		VERY HIGH	HIGH	MEDIUM	VERY HIGH
Unsustainable Fishing	VERY HIGH			VERY HIGH			LOW	VERY HIGH
Unsustainable Hunting		VERY HIGH	VERY HIGH		VERY HIGH		LOW	VERY HIGH
Land Use Change for Agriculture	HIGH	HIGH	HIGH		VERY HIGH	MEDIUM		HIGH
Poaching of Parrots		VERY HIGH						HIGH
Pollution	HIGH			HIGH				HIGH
Unsustainable Logwood Extraction						HIGH		MEDIUM
CTWS THREAT STATUS	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	HIGH	MEDIUM	VERY HIGH

WHAT ARE OUR MANAGEMENT PRIORITIES?

The assessment shows that five of the targets are considered to have a threat status of **VERY HIGH**:

ECOSYSTEMS **Wetland**
Pine Savanna
Riparian (River-side) Forest

SPECIES **Traditionally Harvested Fish**
Game (Hunted) Species

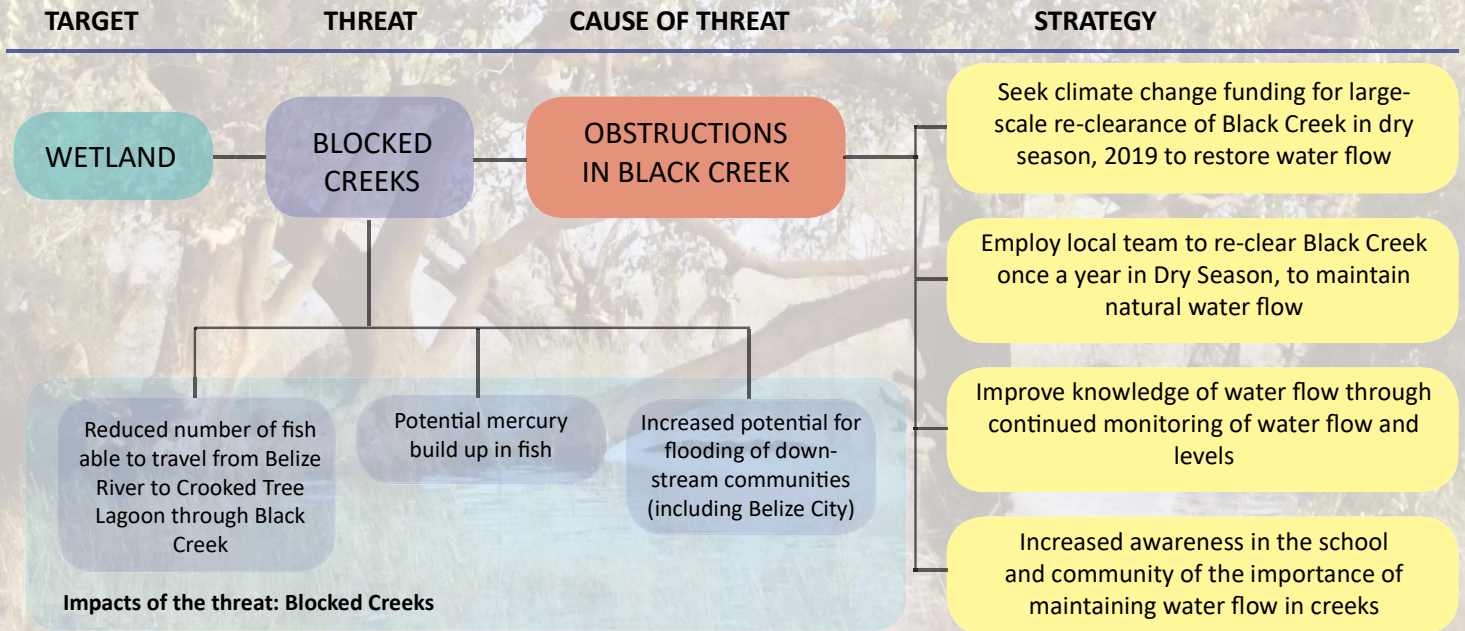
...if we don't do something to improve these targets, they will continue to degrade, and eventually the ecosystems (wetland, pine savanna and riparian (riverside) forest) will not support the plants, fish and birds that live there. The species targets (traditionally harvested fish (bay snook, crana and tuba) and game (hunted) species will not be able to continue to provide food for the community.

WHAT IS CAUSING THE THREATS TO OUR TARGETS?

The threats to each management target were discussed, and the causes of each threat was identified.

HOW CAN WE IMPROVE THE SITUATION?

Participants discussed how the causes of each threat could be addressed to improve the situation - the strategies and activities needed to help the targets recover.



SUSTAINABLE USE PLANNING - HOW CAN WE MAKE THE FISHING MORE SUSTAINABLE?

When Crooked Tree Wildlife Sanctuary moves to a Wildlife Sanctuary (2) designation, it provides an opportunity to support traditional fishers and look at ways for their fishing to become more sustainable over the long term. However, becoming a Wildlife Sanctuary (2) does not automatically mean that fishing is allowed - opening the area up for legal fishing relies on the approval of a Sustainable Use Plan.

Belize uses a Managed Access framework for management of its marine fisheries - the same framework can also be adapted for use in Crooked Tree Wildlife Sanctuary.

WHAT ARE THE BENEFITS OF FOLLOWING A MANAGED ACCESS FRAMEWORK?

1. The Managed Access framework recognizes and protects the rights of traditional fishers of a specific area, such as Crooked Tree Wildlife Sanctuary - ensuring that only those considered traditional fishers are issued with fishing licenses valid for that area.
2. A committee is formed of representatives selected by the fishers, along with the Fisheries Department and other relevant stakeholders - their job is to put together a list of the traditional fishermen - residents of Crooked Tree and other adjacent communities who have fished in the Wildlife Sanctuary for three years or more.
3. The fishing license issued would state that the fisher is allowed to fish in the Crooked Tree Wildlife Sanctuary. Only people with this license have the right to fish in the area. Enforcement is then focused on ensuring no-one else is allowed to fish in the area, and that traditional fishers are following the Fisheries regulations.

WHAT IS SUSTAINABLE FISHING?

For fishing to be termed "sustainable", it must meet the following criteria:

- Be caught from a well managed fishery based on good research data
- Be caught using responsible fishing methods
- Be species that are not regarded as threatened

"Sustainable fishing is using resources in such a manner that they will be available to future generations".



WHAT DO WE NEED TO KNOW TO DEVELOP A SUSTAINABLE FISHERY PLAN?

A Sustainable Fishery Plan needs to be based on good information - some of this information needs to come from fishers in the community, some of it (like Haul Day catch data) is science-based, and has been recorded by Belize Audubon Society over the years. The Fishery Plan needs both types of information to ensure recommendations are based on accurate information and sound science.

- How many traditional fishermen are using Crooked Tree Lagoon?
- Which areas do the fishermen use?
- What types of fish do the fishermen catch?
- What equipment do the fishermen use?
- How often do fishermen fish?
- How does fishing change over the year?
- Where are the fish sold?
- How does the value of the fish sold change with the market location?
- What other threats are affecting the traditionally harvested fish?

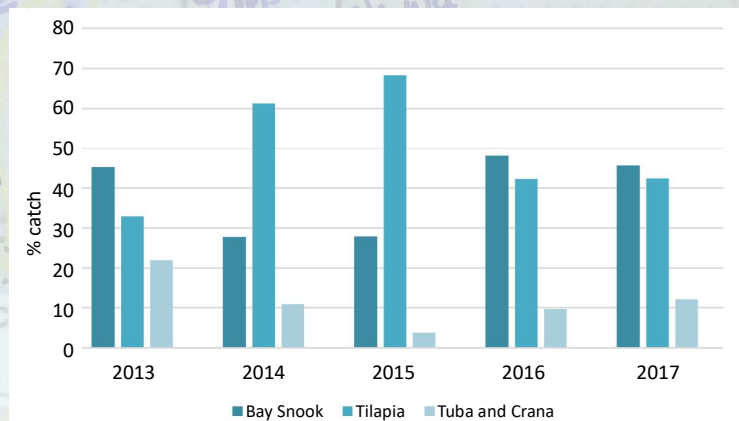
The answers to these questions will help in planning for a fishery that is better managed to be able to support the traditional fishers into the long term.

MAKE SURE YOU ARE AT THE MEETINGS TO ADD YOUR THOUGHTS AND IDEAS TO THE PROCESS

BE A PART OF DESIGNING THE FUTURE!

PARTICIPATORY PLANNING

If you are a traditional fisher of the Crooked Tree Lagoon System, you can help develop the Managed Access framework. Like the Management Plan, sustainable fishery planning should be a participatory process, developed through a series of meetings between fishers and other stakeholders (including the Fisheries Department) in Crooked Tree.



% CATCH PER SPECIES RECORDED ON CTWS HAUL DAYS FROM 2013 - 2017 (BAS DATA)

FISHING SEASONS	February to June	June to October	October to December	December to February
State of Lagoon	Water drains from the lagoon / lagoon dries up. Water heats up during the dry season	As the wet season starts, the lagoon refills, with water from the surrounding wetland drainage and from the Belize River	Continued rainfall leads to the lagoon flooding, inundating the wetland areas	Water level starts to decrease
State of Fish	Annual fish die-off as the water level decreases, and oxygen content declines	Freshwater fish enter the system from the Belize River (upstream)	Fish catch declines as the fish disperse into the wetlands and are harder to catch – catch primarily support household / community needs	
Fishing Practices	Annual haul using seine nets adjacent to the CT Causeway, authorized by the Fisheries and Forest Departments, and by the Village Council. Other fishing areas become more accessible as the wetland dries. Seine nets in water pans, gill nets in creeks	Gill nets are used in the wetland areas, following trails and in clearings – use is restricted to areas where the nets can stretch to the floor. Fishers will camp out for five to 6 days at a time, watching their nets. Spear guns are used when the water is clear, with Tilapia composing an estimated 90% of the catch		Spear fishing for Tilapia

MAPPING FISH AND FISHING ACTIVITY THROUGHOUT THE YEAR (COMMUNITY CONSULTATIONS, 2018)

KEY STRATEGIES AND ACTIONS

ALTERED WATER FLOW		
<p>GOAL: To restore the health and ecosystem services of the wetlands of Crooked Tree Wildlife Sanctuary</p> <p>OBJECTIVE: Engage cross-sectoral stakeholders (Government, communities and landowners) in ensuring that the water flow into and out of the Crooked Tree Lagoon System is not obstructed, with maintenance of natural wetland characteristics and flood sink functionality.</p>		
STRATEGY	ACTIONS	INDICATORS
<p>Restore natural water flow to wetland</p> <p>Overall Indicator of Success</p> <ul style="list-style-type: none"> ▪ % of natural resource users surveyed who think that natural water flow has improved / restored 	<p>Large-scale re-clearance of Black Creek in dry season, 2019 to restore water flow (including removal of construction debris by May Pen bridge), and annual clearance of vegetation</p>	<ul style="list-style-type: none"> ▪ % of identified key blockages in Black Creek removed ▪ Annual clearance of Black Creek ▪ % of natural resource users surveyed who think that natural water flow has improved / restored
	<p>Install culverts in the Blackburn / Western Causeway</p>	<ul style="list-style-type: none"> ▪ % required culverts are in place in causeways and fully functional
	<p>Increase the number of culverts in the Crooked Tree causeway and improve water flow in those that are already there</p>	<ul style="list-style-type: none"> ▪ % required culverts are in place in causeways and fully functional
	<p>Restore / maintain flow into Southern Lagoon and in Spanish Creek</p>	<ul style="list-style-type: none"> ▪ % of natural resource users surveyed who think that natural water flow has improved / restored
IMPROVED SUSTAINABILITY OF FISHERY		
<p>GOAL: Sustainable management of fish stocks in CTWS with protection of traditional users rights</p> <p>OBJECTIVE: Effective introduction and implementation of a Managed Access fishery in CTWS</p>		
<p>Increased pressure for access to fish stock by non-traditional fishers as farming becomes less sustainable</p> <p>Overall Indicator of Success</p> <ul style="list-style-type: none"> ▪ Improved catch per fisher (size / quantity / income) 	<p>Work with CTWS fishers to design and implement a Managed Access fishery structure for CTWS</p>	<ul style="list-style-type: none"> ▪ Site specific Managed Access licenses for CTWS fishers ▪ % of CTWS fishers fully engaged and supportive of Managed Access ▪ Improved catch per fisher (size / quantity)
	<p>Ensure effective, targeted, intelligence-based surveillance and enforcement of CTWS to prevent fishing incursions from non-traditional users of the area</p>	<ul style="list-style-type: none"> ▪ Number of fishing incursions per year ▪ Number of fishing incursions addressed successfully by surveillance and enforcement activities
ADDRESSING FIRE IMPACTS		
<p>GOAL: To reduce incidences of fire in the Crooked Tree Wildlife Sanctuary landscape, reducing risks to ecosystems, crop protection and wildlife</p> <p>OBJECTIVE: Engage stakeholders in active, improved fire monitoring and management in the landscape</p>		
<p>Reduce risk of fire in the Crooked Tree Wildlife Sanctuary landscape</p> <p>Overall Indicators of Success</p> <ul style="list-style-type: none"> ▪ Number of fires that impact CTWS per year ▪ Number of acres of CTWS impacted 	<p>Conduct a community awareness campaign to improve fire awareness before each dry season, including signage (Protect pine, protect cashew, no fire)</p>	<ul style="list-style-type: none"> ▪ % of community members that demonstrate an increase in fire awareness ▪ % of farmers / hunters who are considered to be fully engaged in improved fire management in the landscape ▪ % of total students in school participating in activities focused on fire awareness per year ▪ Pre and post awareness campaign surveys of community members to measure fire awareness
	<p>Provide training for community members, local farmers and BAS staff in effective fire management</p>	<ul style="list-style-type: none"> ▪ Number of patrols that include a focus on enforcement of fire regulations ▪ Number of prescribed burns
	<p>Enforcement of fire regulations – targeted surveillance of identified fire hotspots and at critical times</p>	<ul style="list-style-type: none"> ▪ Number of patrols that include a focus on enforcement of fire regulations ▪ Number of prescribed burns

KEY STRATEGIES AND ACTIONS

INCOME DIVERSIFICATION FOR NATURAL RESOURCE USERS

GOAL: To improve income diversification opportunities in Crooked Tree for traditional natural resource users

OBJECTIVE: To reduce pressures on the natural resources of CTWS by providing opportunities for supplemental income from other sources through skills training, capacity building and financial assistance

STRATEGY	ACTIONS	INDICATORS
<p>Improve employment / income diversification opportunities in the community for natural resource users</p> <p>Overall Indicator of Success</p> <ul style="list-style-type: none"> % of annual income of traditional natural resource users that is from natural resource use 	Construct a replacement Visitor Centre at the BAS CTWS site as a focal point for the Wildlife Sanctuary, with information relevant to the bird tourism market, opportunities for sale of local crafts and produce, and linking arriving visitors with tour guides / hotels	<ul style="list-style-type: none"> New Visitor Centre Level of visitor satisfaction with interpretation provided by Visitor Centre Number of visitors to Center per year
	Develop and implement a marketing plan for CTWS and the Crooked Tree village, including international marketing at bird fairs and through BTIA / BTB	<ul style="list-style-type: none"> Annual budget allocated to marketing Number of visitors to CTWS
	Develop and implement a Crooked Tree Wildlife Sanctuary Investment Strategy built around bird tourism	<ul style="list-style-type: none"> Completed Investment Strategy Annual review of implementation and outcome / impact indicators
	Provide training for natural resource users and their families as site-level guides, hospitality services, craft skills, food handling etc.	<ul style="list-style-type: none"> % of identified natural resource users and their families taking advantage of training opportunities Number of participants on each course % participants that graduate per course % participants that consider the skills learnt improve their livelihood opportunities
	Provide structured training for natural resource users and their families in business management, business start up and financial management	<ul style="list-style-type: none"> % of identified natural resource users and their families taking advantage of training opportunities Number of participants on each course % participants that graduate per course % participants that consider the skills learnt improve their livelihood opportunities
	Provide micro-loan / grant packages to support viable business ideas for natural resource users and their families, and to improve employment opportunities in the communities	<ul style="list-style-type: none"> % of identified natural resource users and their families taking advantage of micro-loan / grant opportunities
	Identify and address key needs of Advanced Bird Guides for bird tourism through consultation towards development of a globally recognized high standard birding destination	<ul style="list-style-type: none"> Level of satisfaction of Advanced Bird Tour Guides with CTWS as a tourism destination Level of visitor satisfaction of birders

PARTICIPANTS

Crooked Tree Village: Alden Wade, Alistair Crawford, Anne-Elie Etienne, Antoinette Tillett, Ava Tillet, Bruce Tillett, Charlene Flowers, Dana Staley, Dean Tillett, Delma Tillett, Donald Tillett, Dorla Wade, Earl Nicholson, Edward Crawford, Eric Wade, George Guest, Hugh Tillett, Humphrey Armstrong, James Dawson, Jane Crawford, John Gillett, Judy Tillett, Kathlyn Tillett, Kenneth Bruce, Laurance Bonner, Landis Bull, Mario Romero, Mike Wongk, Owen Gillett, Petrona Gillett, Robert, Rubin Crawford, Salome Tillett, Steve Perriott, Steve Tillett, Steven Flowers, Verna Samuels, Yoshinori Wakabayashi, Mr. Gillett.

Forest Department: Saul Cruz, Rasheda Garcia, Zelly Tzul, Alex Escalante.

Fisheries Department: Rigoberto Quintana, Gilberto Young, Andres Aldana.

Belize Audubon Society: Amanda Burgos-Acosta, Shane Young, Lucito Ayuso.

Project Team: Jennie Garcia-Saqui, Pio Saqui, Paul Walker, Zoe Walker.