



# Annual Report 2013

Ya'axché Conservation Trust

Punta Gorda | March 2014

### **Cover page**

Yucatan Black Howler (*Alouatta pigra*)  
Photo: Erik Hammar, courtesy of Wildtracks

### **Back page**

*Boa constrictor*  
Photo: Erik Hammar.

### **Maps**

All maps prepared by Jaume Ruscalleda.



# Annual Report 2013

## Ya'axché Conservation Trust

### Punta Gorda, Belize - March 2014

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Dusk in the lowland forests of Toledo,  
as seen from Machaca Hill.

Photo: Erik Hammar



# CAYO DISTRICT

MAYA MOUNTAINS

BLADEN NATURE  
RESERVE

THE MAYA GOLDEN LANDSCAPE

# TOLEDO DISTRICT

MEDINA BANK

GOLDEN STREAM

INDIAN CREEK

BIG FALLS

GSCP

Southern Highway

PUNTA GORDA

CARIBBEAN SEA

EL SALVADOR

BELIZE

MEXICO

GUATEMALA

HONDURAS

NICARAGUA

0 2 4 8 12 16



Kilometers



Squirrel Cuckoo (*Piaya cayana*).

Photo: Erik Hammar



An epiphyte working its way up the stem  
of a tree in Bladen Nature Reserve.

Photo: Erik Hammar

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## List of acronyms

APAMO	Association of Protected Area Managers
BFREE	Belize Foundation for Research and Environmental Education
BNCF	Belize Nature Conservation Foundation
BNR	Bladen Nature Reserve
BRIM	Biodiversity Research, Inventory and Monitoring
CITES	Convention on International Trade in Endangered Species
COL	Community Outreach and Livelihoods
COMPACT	Community Action Global Impact
CRFR	Columbia River Forest Reserve
FFI	Fauna and Flora International
GEF-SGP	Global Environment Facility – Small Grants Program
GIS	Geographic Information Systems
GIZ-CATS	Gesellschaft für Internationales Zusammenarbeit - Caribbean Aqua-Terrestrial Solutions
GSCP	Golden Stream Corridor Preserve
GTC	Global Trees Campaign
ILM	Integrated Landscape Management
LULC	Land Use Land Cover
MGL	Maya Golden Landscape
MMNFR	Maya Mountain North Forest Reserve
NPAS	National Protected Areas System
NRTA	National Ranger Training Academy
PACT	Protected Areas Conservation Trust
PAM	Protected Areas Management
PLUP	Participatory Land Use Planning
SMART	Spatial Monitoring and Reporting Tool
TIDE	Toledo Institute for Development and the Environment
UNDP	United Nations Development Program
WCS	Wildlife Conservation Society

## **From the Executive Director**

2013 has proven to be a year of overwhelming support and great accomplishments as we continue to strive for harmony between nature and human development for the benefit of both. As with all other conservation NGO's in Belize, challenges are always present especially as it pertains to carrying out the difficult task of patrolling and safeguarding our protected areas.

Ya'axché has always described its work within the boundaries of the magnificent Maya Golden Landscape but activities carried out in 2013 went far beyond that. Due to strong support received from the Ministry of Fisheries, Forestry and Sustainable Development (MFFSD) in working with farmers directly impacting the Maya Mountain North Forest Reserve, Ya'axché has embarked on building relationships with the communities of Trio and Bella Vista in promoting best agricultural practices. Ya'axché has maintained contact with the interested groups throughout the year and has acquired feedback on their vision for the ideal agroforestry farm.

Ya'axché's greatest strength lies within its exceptional, dedicated staff. The successes of 2013 would not have been possible without the combined efforts of the Community Outreach & Livelihoods Program team, the Finance & Development officers and the Protected Areas Program staff. Their hard work and dedication is of great admiration - especially the tireless hours spent in the field. Whether it is the rangers patrolling protected areas and confronting the unexpected, or the agroforestry personnel promoting and teaching best agricultural practices to farmers within the Maya Golden Landscape, their energy and enthusiasm is highly commendable. The Finance and Development teams should also be congratulated. Long hours in the office writing proposals and compiling budgets help to ensure that Ya'axché has the necessary funding to continue its vital work. Last but by no means least, the team of international volunteers bring a wealth of skills and experience and continue to provide essential input across all program areas.

Accompany me and my team to view the highlights of Ya'axché's achievements for 2013 and to share all of the hard work in which we have been involved over the past year. The support received from all our funders and partners has been crucial to our success. We sincerely hope that you join us in 2014 as we share more of our accomplishments and continue to pursue our mission.

Sincerely,

**Christina Garcia,**  
Executive Director



# **Strategic Plan**

The work carried out by Ya'axché is guided by a strategic plan that sets out the goals of the organization and the means to achieve them. The strategic plan for the period

2012 to 2014 was finalized in November 2011 and includes updated mission and vision statements as well as updated organizational values.

## **Vision statement of the organization**

Harmony between nature and human development for the benefit of both.

## **Mission statement of the organization**

Ya'axché is a Belizean organization which aims to maintain healthy forests, rivers and reefs for the benefit of all through protected area management, advocacy, and working hand in hand with communities to develop capacity for the wise use of land and natural resources in and around the Maya Golden Landscape in Toledo.

## **Organizational values**

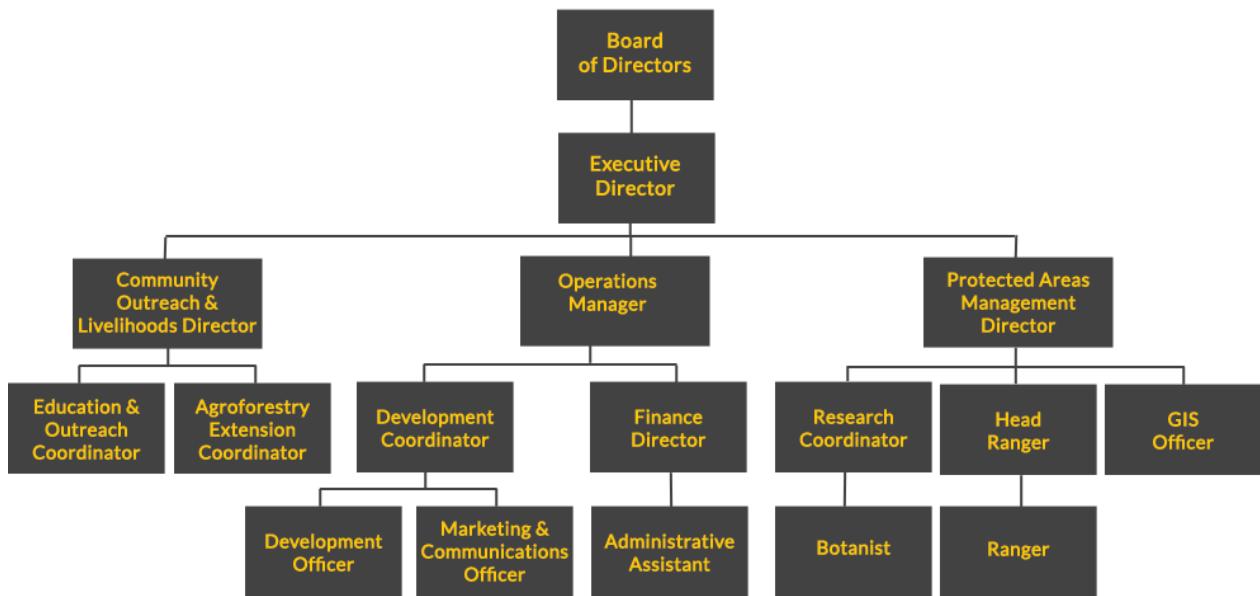
Ya'axché...

- has passion, dedication and commitment to its vision
- has respect for ethnic and cultural diversity
- is inclusive
- is adaptable and responsive
- strives for 'openness' and transparency
- values participation and collaboration
- values integrated approaches
- values being a proactive advocate
- values professionalism and teamwork

# Institutional Structure

Ya'axché operates under the principle of sustainable land-use management, where conservation and sustainable development are planned at the landscape level for the benefit of all.

Ya'axché has two program areas that both contribute to sustainable land-use management: Protected Area Management program (PAM) and Community Outreach and Livelihoods (COL) program.



# **External communication**

## **Website**

The redesign of Ya'axché's website in 2012 has led to an increase in visitors from people across the globe. In fact, our website has attracted 11,383 unique visitors to date. The new-look website has allowed for current and important information to be shared with Ya'axché's supporters. They can now be directly connected to our Facebook page, our membership program, articles published, and other historic information on the organization. Our website address has remained the same: [yaaxche.org](http://yaaxche.org).

## **Membership program**

Ya'axché launched its membership program in 2013 and those who sign up to be a member receive our free monthly newsletter. In January 2014, Ya'axché launched its expanded membership program that now allows supporters to donate to our work. Supporters have the opportunity to choose from different membership levels that range from US\$45 - \$1,000 in cost. Further details can be found on our website. Free membership remains available and all members have the option to upgrade their membership.

## **Social media and publications**

As always, we remain committed to increasing public awareness of environmental issues and to communicating our vision, mission and associated activities. Ya'axché has been utilizing social media to communicate to our supporters for several years. Our communication via social media is guided by a strategy with the aim of improving the general public's knowledge of Ya'axché. We remain active on Facebook, Twitter and Vimeo with frequent posts. We currently have over 1,600 followers on Facebook. We also write and publish articles regularly in national and international press. Links to this year's publications can be found at our website.

## Community Outreach & Livelihoods Program

It has been a very busy and remarkable year for the Community Outreach and Livelihoods team as we continue our work with the communities of the Maya Golden Landscape. 2013 was indeed active and fun-filled, and we draw energy and motivation from it for the new year. The program has seen a productive and successful year in engaging our farmers and communities at large. The team looks forward to another exciting year as we strive to make our region a better place to live.

### Agroforestry

Agroforestry remains our primary focus with the farmers in the communities, in an effort to promote better agricultural practices that will enhance economic and environmental conditions in the region. Over 23,500 cacao saplings were distributed to farmers this year - either to expand existing orchards or establish new ones. An additional 300 grafted fruit trees were given to 15 farmers to plant on their farms to provide shade for other crops, food and income. Three farms were established as demonstration farms where peer-to-peer (learning by seeing and doing) training was carried out.

A Global Environment Facility Small Grants Program (GEF SGP) project enabled four farmers from Indian Creek and San Miguel to attend a two-day training course at Maya Mountain Research Farm in San Pedro Columbia. Agroforestry design, livestock, composting and biochar were some of the many interesting topics discussed during the training. Special thanks to Christopher Nesbitt and the great Maya Mountain Research Farm crew for hosting us and sharing their knowledge and experience!

Alley cropping is a technique that improves soil management and productivity in degraded farmlands. It is a system that uses leguminous trees such as madre cacao or bri-bri, planted in rows along contour lines on slopes to create a barrier, with crops such as corn and beans planted in between the rows of trees. Tree roots assist in retaining topsoil, return nitrogen to the soil, and the pruned leaves provide organic fertilizer for better yields. Fifteen pilot alley cropping farms were established in four communities and it is our hope that more farmers will adopt this system in order to improve food security in the face of climate change. Farmers participating in the alley cropping pilot project took part in a number of field visits in 2013, including a visit to two Kekchi villages in Petén, Guatemala to exchange experiences on the multiple uses of farmland plots.

### Farmer of the Year Award

In May, our first Farmer of the Year event saw three farmers rewarded for their efforts in using better agriculture practices in and around the Maya Golden Landscape. Practices include cacao-based agroforestry, slash and mulch farming and small livestock rearing. The use of chemicals, care for riparian zones and use of cover crops (such as mucuna beans) were all taken into consideration in selecting the winners. Seventeen farmers (from the villages of San Miguel, Big Falls, Silver Creek and Indian Creek) participated. Farms were judged by extension officers of Sustainable Harvest International, Maya Mountain Cacao and Ya'axché. Winners of the event were Santiago Cus (1<sup>st</sup>) from San Miguel, Leonardo Cucul (2<sup>nd</sup>) from Big Falls, and Hubert Cus (3<sup>rd</sup>) from San Miguel.

## Beekeeping

Through a Global Environment Facility Small Grants Program (GEF SGP) project, five new beekeepers will receive training and assistance from Ya'axché, which brings the total number of beekeepers in the Maya Golden Landscape to 16.

Additionally, 15 new beehives along with beekeeping materials such as smokers, veils, gloves and wax were procured. Refresher training and box building were conducted with the farmers. Beekeeping activities help to increase Toledo's sustainable livelihoods scenario and we hope to be able to encourage more farmers to produce this delicious, forest-friendly product in 2014.

## Race Against Fire

Our annual Race Against Fire event was held in the village of Big Falls on 30 March 2013 and saw 28 riders compete in the main event. The theme for the day was "Less burning = Less damage". Winners of the bicycle race were Juan Bah (1<sup>st</sup>), Pedro Che (2<sup>nd</sup>), Julio Bah (3<sup>rd</sup>).

The Parent/Teachers Association (PTA) of Big Falls along with representatives from Toledo Institute for Development and Environment (TIDE) joined us to make this occasion a huge success. The PTA took advantage of the event to raise much-needed funds for the school by the sale of food and drinks, and also sponsored a football marathon.

## Summer Camp

Our summer camp of 2013 took a slightly different approach from previous years. Instead of hosting children at our Golden Stream field station, we took summer camp out to the local communities.

A two-day camp was held for children from San Miguel, Silver Creek, Big Falls, Indian Creek, Golden Stream and Medina Bank. Under the general theme of 'Caring for Nature is our Culture' children between the ages of 8 to 14 years participated in fun and educational presentations, discussions, arts and crafts activities, competitions, and watched educational videos on ways to take care of the earth.

After two very busy days, the participants went on a field trip to Rio Blanco National Park and the San Antonio waterfall. A total of 145 children attended the summer camp and went home with a positive mind and a good attitude towards caring for the environment. The 2013 summer camp was sponsored jointly by Ya'axché, and by the Whitley Award.



Ya'axché's botanist Gail Stott and Sustainable Land-use officer Jaume Ruscalleda look at photos together with children participating in Race Against Fire 2013.

Photo: Erik Hammar

## Scholarships

At the start of the 2013 school year Ya'axché was able to offer support to 12 new students, making a total of 35 enrolled in high school education. The villages with supported students are Trio, Medina Bank, Golden Stream, Indian Creek, Silver Creek, Big Falls and San Miguel. Seven high school students from 5 communities graduated in the month of June. This makes a total of 45 graduates since the start of Ya'axché's scholarship program in 2003. After graduating, most scholarship students continue their education at university level, frequently to pursue either Natural Resource Management or Business degrees. Others receive jobs in specialized fields such as tourism and agriculture. Many thanks to our sponsors and supporters who donated online to this program!

## Participatory Land-use Planning

Community Land Use Planning has great potential to become an important pillar of Integrated Landscape Management, a conservation approach that Ya'axché has been implementing since 2006. During 2013, Ya'axché, with the assistance of an MPhil Conservation Leadership student (Josie Chambers) from the University of Cambridge UK, facilitated workshops for the Indian Creek community. The first step was to create a committee that included representation from all the village groups (including leaders, farmers and women). During a series of 5 workshops, community representatives discussed the importance of prior planning in the use of natural resources, and also identified the main challenges that the village will face in the coming years. The planning process will

include an initial assessment of resources available to the villages (through the use of a camera and a GPS device), establishment of a common vision by asking the question "How do community members want their village to look like in the future?", and setting up the steps that need to be taken to reach that desired future state. With the support of the village, Ya'axché will continue promoting Participatory Land Use Planning in Indian Creek. Special thanks go to Josie Chambers and Fauna and Flora International!

## Participatory Mapping Workshops

Between the months of June and September, Ya'axché acted as consultants for a series of 5 Participatory Mapping Workshops in the Toledo District. The project was designed by the Toledo Institute for Development and the Environment (TIDE) and funded by PACT. We consulted 19 communities of Toledo in order to create a comprehensive map that showed the location of villages in relation to different protected areas using distinctive landmarks that local people would recognize. We used symbols designed by the participants to highlight the different regulations that apply in the different types of protected areas that exist in Toledo. Land use and land cover types were also mapped using a combination of satellite imagery and discussion with workshop participants. As facilitators, we learnt a lot about the communities' spatial perception and the landmarks that can be used for targeted mapping. Maps and leaflets will be distributed by TIDE during 2014.



Nursery technician Miguel Coc has raised more than 40,000 seedlings this year which are distributed to farmers across the Maya Golden Landscape.

Photo: Kevin Wells

## **Local Watershed Group takes off!**

In the second half of 2012, a new watershed group was established in Medina Bank village through a United Nations Development Programme COMPACT (Community Action Global Impact) funded project. During the first seven months of 2013, the group (Protectors of the Corridor), completed project activities including reforestation, the establishment of a computer lab in the village school (four laptops, one printer and one projector, all powered by three solar panels), environmental education sessions and field trips, as well as providing school equipment for ten high school students. Good job Protectors of the Corridor and Medina Bank village - and many thanks to UNDP COMPACT!

## **Leadership and Good governance**

We firmly believe in empowering community leaders and supporting them through capacity building workshops so that they can make informed decisions and drive community work forward in ways that are efficient and effective. In September 2013, Ya'axché conducted a leadership training workshop at the Nazerene Convention Centre. Members of the village councils, Alcaldes (traditional village leaders), chairmen, farmers and group leaders from 6 Toledo communities attended. The workshop agenda focused on

the qualities of a good leader, roles and responsibilities of leaders and values of good leaders. The second component of the workshop included a discussion on democracy and good governance. The workshop was designed to be fun and interactive, with participants sharing their experiences, discussing real life issues and problems, and learning from each other.

## **Nursery renovation**

2013 saw major renovations and expansion of the tree nursery at our Golden Stream field station. This work is part of a new project that aims to build capacity for tree conservation in Belize. As well as continuing to provide saplings to local farmers, the tree nursery will also provide space for propagation trials of 18 rare and/or threatened tree species. The nursery now has a concrete floor, metal posts and new shade cloths. The project is a collaboration between Ya'axché and the Global Trees Campaign and will also include survey work in the Golden Stream Corridor Preserve and the Bladen Nature Reserve, as well as training and awareness-raising activities. Big thanks to Marchilio (Head Ranger), Kenny (Agriculture Extension Coordinator), Miguel (Nursery Technician) and the rest of the team who all worked hard to get the job done, despite the rain!

## Land-use change

Since 2011, Ya'axché has been using Geographic Information Systems and Remote Sensing to monitor Land Use/Land Cover (LULC) change in the Maya Golden Landscape (MGL). During 2011 and 2012, we focused on analysing trends over the last 32 years (1980-2012), and we identified a clear expansion of the human footprint in the MGL, which grew from 10,872 acres in 1980 to 27,292 acres in 2012 (a 250% increase, including agricultural uses and escaped fires of human origin).

## Agricultural & Ecosystem Services

Land provides communities with agricultural and ecosystem services, both of which are necessary for their wellbeing. To ensure these services, Ya'axché's goal is to minimize land-use change rates through sustainable agricultural intensification. This requires making the most out of the land while taking care of the soil so it can keep on providing during a farmers' life and for future generations. In order to achieve this, our field staff have been promoting practices like cacao-based agroforestry, slash and mulch, corn alley cropping, beekeeping, small livestock rearing and the use of compost and biochar – all of which combined are referred to as an Integrated Farming System.

This pool of sustainable livelihoods allows farmers to have a constant income while leaving a larger area of forest untouched (i.e. areas close to and upstream from human settlements). These standing forests then provide communities with essential ecosystem services like clean drinking water, reduced flood risks, local

rainfall generation, natural crop pollinators, game population replenishment and erosion prevention among many others. Our LULC change monitoring program is allowing us to track changes and share them with communities, so they can plan development strategies that allow them to obtain both agricultural and ecosystem services from their land.

## Land use/cover change in 2013

During 2013, Landsat satellite imagery (corresponding to the months of March, June, July and August) has been our main source of information, and its analysis has revealed an increase in forest loss in the Maya Golden Landscape. Informal reports from our rangers and the farmers we work with indicate a very severe dry season in 2013, both in terms of temperature and rainfall. This has translated to an increase in burnt areas and escaped fires, both in the already existing agricultural matrix (areas that have been used for agriculture before and have grown back into a secondary forest), and in forested areas that had not been used for agriculture in the past, which indicates an advance of the agricultural frontier. Compared to 2012, agricultural clearances have almost doubled, both in the agricultural matrix and in the forest, whereas escaped fires (which were almost non-existent during 2012) accounted for 1,727 acres of forest loss (Figure 1). These numbers highlight the need to keep up and increase the work we do in promoting sustainable agricultural practices, wise fire use and land use planning, which we will continue to do in 2014.

# BLADEN NATURE RESERVE



- Rivers and Streams
- Roads
- Forest
- Broken Ridge
- Shrubland
- Savannah
- Vega Bush
- Mangrove/Wetland
- Agricultural Matrix
- Agricultural use in 2012
- Cleared for agriculture in 2013
- Escaped fires in 2013
- Bare Rock
- Citrus
- Urban
- Water
- Other

Big Falls

Indian Creek

MGL

Golden Stream

Tambran

GOLDEN STREAM CORRIDOR PRESERVE

Medina Bank

GUATEMALA

MGL

0 0.5 1 2 3 4 Miles

## A birds view of the communities

For the second year in a row, and thanks to LightHawk, Ya'axché conducted a photographic flight over two Maya Golden Landscape communities – Golden Stream and Indian Creek. Flying at 600 m altitude and following 14 parallel rows, we took over 300 pictures of the community lands, covering an approximate area of 25,000 acres. The map on the following page shows an agricultural clearing in the Indian Creek community (right next to the Columbia River Forest Reserve boundary) developed during 2012, and expanded during 2013.

Given the optical properties of the camera and the flight altitude, we obtained pictures of very high resolution (between 15 and 25 cm pixel size, compared to the 30 m pixel size we get from Landsat images), which are accurate enough to distinguish forest types and a few crop types.

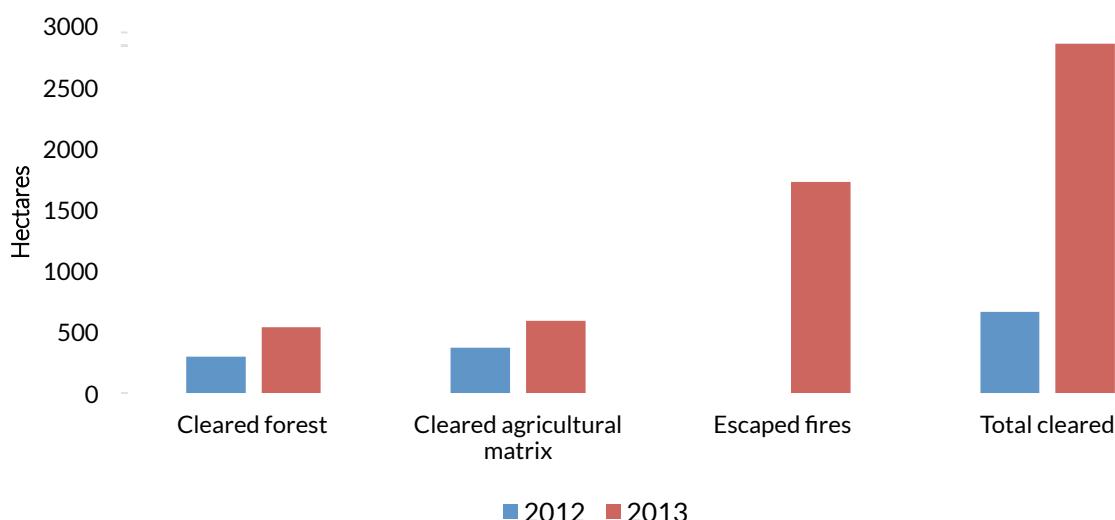
This will allow us to create more precise land use/land cover types and share them with the communities so that they can plan their agricultural development in a more informed way.

## Looking to the future

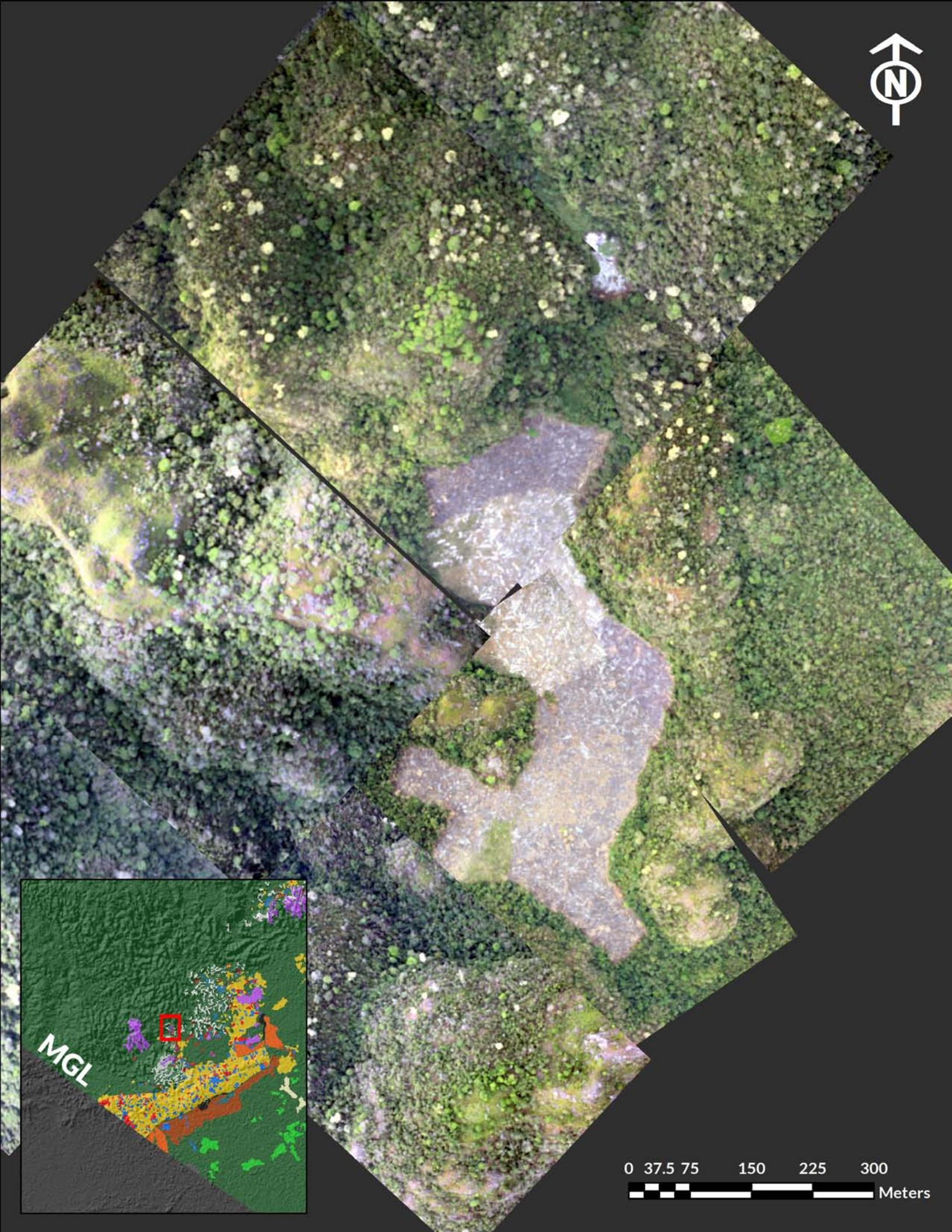
Planned agricultural development and location of key conservation areas will be very important factors in obtaining the necessary agricultural and ecosystem services that the Maya in southern Toledo need from the land. During 2013, first steps in staff training have been taken in order to determine which environmental and geographic factors contribute to the expansion of the agricultural frontier, and thus we are able to model land use change into the future under different development scenarios. Our continuing research will help to shed light on how the Maya Golden Landscape might look in 15 or 20 years time.



Agricultural clearances and escaped fires in the MGL  
2012-2013



**Figure 1.** Agricultural clearances and escaped fires in the MGL: 2012-2013 (in acres).



0 37.5 75 150 225 300  
Meters

## Protected Areas Management program

The Protected Areas Management (PAM) program continues to professionalize and steadily integrate techniques that have been tried and tested regionally and globally, to ensure that Ya'axché remains at the cutting edge of protected areas management. These techniques include the analysis of remotely sensed images to rapidly detect changes in forest cover, the piloting of the Spatial Monitoring and Reporting Tool (SMART) and the refining of our biodiversity data collection, data basing and analysis.

All of these tools are ultimately used and improved to increase Ya'axché's protected area management effectiveness by providing better information for decision-making. One of the key strategic directions for the Protected Areas Management program is to institute measurable indicators of management effectiveness. We need to know whether faunal and floral populations are remaining stable and whether illegal incidents are increasing in relation to patrol efforts. There is a long way to go before we achieve this but there is no doubt that we are on the right track.

In addition, our internal communications have been improved through regular (every 10 days) PAM team meetings and weekly management team meetings. Applying diverse perspectives, skills and experience leads to better thought out decisions. To complement this Ya'axché and partners are successfully holding regular interagency and co-managers enforcement meetings, and meetings with the Southern Belize Fire Working Group. Ranger placements with Chiquibul co-managers (Friends for Conservation and Development) have also

given our team experience in 'front-line' conservation dealing with xateros, illegal gold mining and illegal loggers.

On the national stage Ya'axché continues to play a strong role in strengthening the National Protected Areas System (NPAS) as pace gathers in developing an administrative structure, amending legislation and identifying necessary steps in securing its financial sustainability. There has perhaps never been a better time to achieve meaningful improvements to the NPAS since its creation, and the completion of the Rationalization of the NPAS (Wildtracks, 2013) as a 'blueprint' for this development provides targets for the Ministry of Forestry Fisheries and Sustainable Development and protected area co-managers.

Significantly, 2013 saw the launch of the National Ranger Training Academy (NRTA). This marked a major milestone in its development - which has been ongoing since 2010. Through funding from the Protected Areas Conservation Trust (PACT), via the Association of Protected Area Management Organizations (APAMO), Ya'axché delivered two abridged trainings to 6 protected area management organizations from across Belize. This work will continue in 2014 with a PACT-funded pilot of the full program. Three modules will be delivered between June and August. Ya'axché's role in this process stems from a vision to bring together national and international expertise to raise the standards of protected area rangers across Belize.



Budding rangers from across Belize receive their certificates from the National Ranger Training Academy

Photo: Maarten Hofman

## **Enforcement**

Ya'axché's two protected areas, Bladen Nature Reserve, and Golden Stream Corridor Preserve continue to contrast greatly in the character and frequency of threats. Golden Stream Corridor Preserve faces relatively low levels of threats despite community lands directly adjacent.

This is likely due to a combination of the significant patrolling effort undertaken by the ranger team, the fact it is known to be private land, and also the continued lack of any management presence in the adjacent Boden Creek Ecological Preserve. Ya'axché will be paying close attention to the potential new owners of the carbon credited Boden Creek, and the extent to which they will take control of management whilst ensuring a good relationship with the adjacent communities, particularly Indian Creek.

Bladen Nature Reserve on the other hand continues to be subject to xaté extraction, confirmed by four separate deep patrols to the central and western regions of the reserve. Active trails were discovered in Columbia River Forest Reserve heading into Bladen but further north than previously identified main access routes. A clearance on the area known as Little Quartz Ridge was groundtruthed by the patrol and an apparent escaped fire from a xatero camp was discovered to have burned around 5 acres in this key biodiversity area.

Enforcement in this region is primarily limited to reconnaissance, and Belize Defense Force support is for security purposes only. Over the coming years Ya'axché intends to develop this to mirror the advances made by the Cayo Joint Patrol Unit that is having success in the Chiquibul Forest Complex.

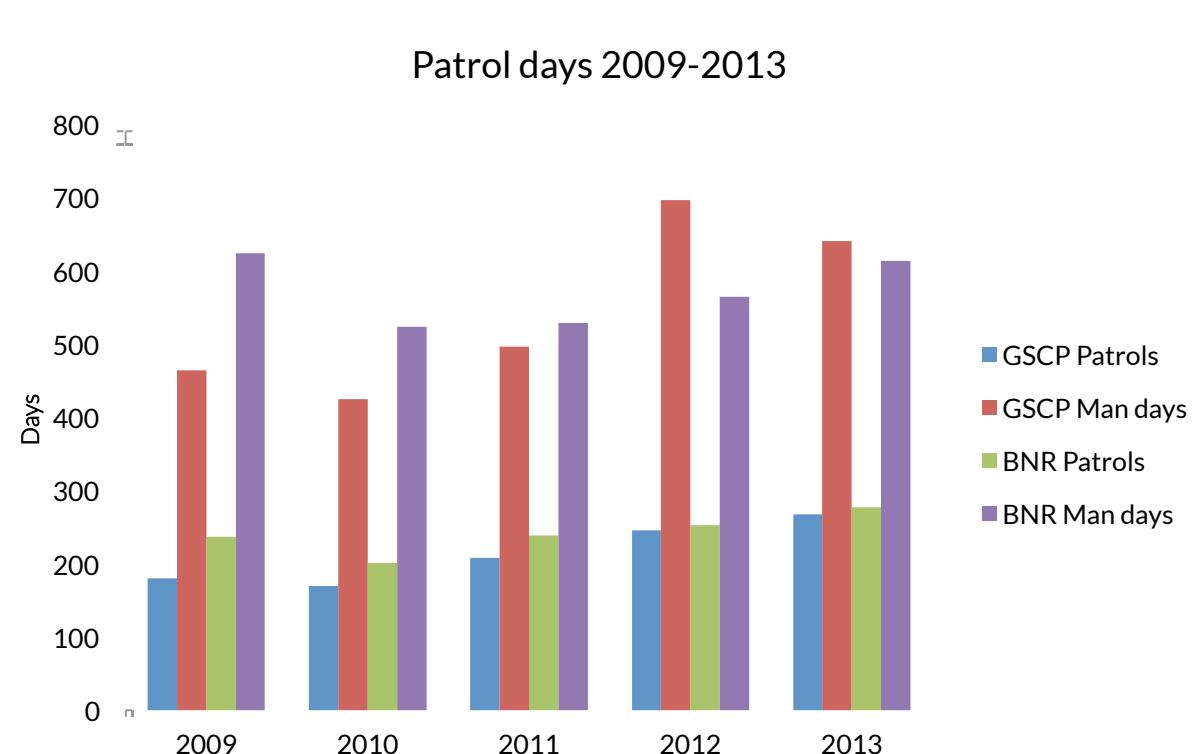
A potential emerging threat is the possibility of illegal gold mining from the upper watersheds close to the Maya Divide. This has been confirmed within 4 km of the Bladen Nature Reserve boundary. Ya'axché is communicating regularly with the co-managers of Chiquibul National Park to monitor this threat. The geological reports suggest that the area of potential for gold mining may extend inside the northwestern boundary of Bladen.

In the eastern regions of Bladen (which are patrolled more frequently by Ya'axché and have not yet been infiltrated by xateros) we continued to see lower levels of incursions in 2013. The rapid expansion of some

nearby villages (due to recent immigration to Belize from El Salvador, Honduras and Guatemala) poses a potential threat and there is a need to increase awareness raising activities to keep pace. Ya'axché rangers confronted two separate groups inside Bladen in 2013.

The regulations of the reserve were explained and firearms confiscated. These groups are primarily interested in hunting and fishing, but also of concern are reports that chemicals are being used to collect crayfish from the Bladen River. Our team is keeping a close eye on this threat.

Patrol days are presented in Figure 2.



**Figure 2.** Summary of patrol days carried out in Golden Stream Corridor Preserve (GSCP) and Bladen Nature (BNR) 2009-2013.



Sustainable xaté processing house in  
Uaxactun, Petén, Guatemala.

Photo: Lee McLoughlin

Rosewood continued to be a major issue for enforcement with considerable extraction occurring through out logging season in lands adjacent to Bladen Nature Reserve and Golden Stream Corridor Preserve. This included Maya Mountain North Forest Reserve, Private Protected Lands belonging to the Toledo Institute for Development and the Environment (TIDE), and Deep River Forest Reserve (Gomez' concession). In December Ya'axché rangers discovered that rosewood had been extracted adjacent to the highway inside Golden Stream Corridor Preserve.

In late 2013 (and planned for integration and piloting in 2014) the Spatial Monitoring and Reporting Tool (SMART) has been identified by the management team as the ideal next step on our path toward better management effectiveness. SMART has the capacity to help our management team better monitor, evaluate and adapt our ranger activities through improved and more comprehensive patrol data collection, databasing and ultimately analysis and reporting.

The Belize Nature Conservation Foundation is financially supporting this pilot and Ya'axché has received training from the Wildlife Conservation Society (WCS), who developed the tool. WCS have tested this tool extensively in Africa but it needs to be tested in the Central American region. The Belize Fisheries Department has adopted SMART and is currently rolling it out nationally.

## **Human-Jaguar conflict**

In 2013, Ya'axché began to hear increasing reports of jaguar trapping and jaguar kills, particularly from communities with cattle farms. Through funding from Panthera, Ya'axché has formed a partnership with Forest Department's Jaguar Conflict Officer to address the rising number of human-jaguar conflict cases in both the Maya Golden Landscape and the wider Toledo District. Responding to conflict cases as far away as the village of Boom Creek, the scope of impact is great. This partnership has been very effective and seems to be strengthening with time.

As Ya'axché's Jaguar Conflict Resolution Officer, Marchilio Ack (Ya'axché's head ranger) becomes more well-known in the communities for dealing with these issues, and builds on his already respected status locally, he can assist the Forest Department and Panthera in helping to avoid unnecessary jaguar mortality and also in ensuring that data is collected from those incidents that do result in jaguar mortality. This model has the potential to be replicated nationally as Panthera builds its research, education and conflict mitigation programs.

## Fire Management

2013 was one of the worst years for escaped fires and forest fires in the Maya Golden Landscape since the post Hurricane Iris fires of 2003. The primary causes were escaped agricultural fires and specifically milpa (slash-and-burn) agriculture. Recognizing a growing trend of escaped fires in recent years, and in light of the fact that this trend is likely to continue with the predicted climate change impacts of increased temperature, increased incidence of drought and reduced overall precipitation, it was clear that urgent action was needed. A large escaped fire originating from a pepito farm on the edge of Columbia River Forest Reserve burned over 400 acres, and an escaped illegal milpa fire adjacent to Golden Stream Corridor Preserve spread into the corridor burning more than 70 acres. These incidents are just examples of a problem which has affected the entire country.

From our involvement in the Participatory Land-use Planning process, farmer's forums and from personal communications there was a clear consensus from the local communities that fire was getting out of hand. The primary reasons raised by communities for needing to tackle the problem were the accidental burning of farmland with corn, beans and mature cacao plantations frequently lost. The conflict that arises out of these situations creates disharmony in the community and reduces social cohesion.

In addition to the loss of property, fire destroys forest products such as building materials, food and medicine.

Serendipitously, at the end of a long dry season an opportunity arose to request support from the GIZ Caribbean Aquaterrestrial Solutions project 'Adaptation of rural economies and natural resources to climate change'. Through this project Ya'axché was able to team up with the Southern Belize Fire Working Group to put together a series of trainings which raised awareness of how to safely prepare and burn a milpa, how fire behaves, fire weather and basic equipment use. These trainings were delivered to more than 40 community leaders, and farmers in Spanish and English.

Information gathered through discussion during the training enabled Ya'axché to prepare a series of educational posters that have been specifically targeted to provide basic information on how communities can avoid escaped fires from their milpa. Ya'axché realizes that this is just the beginning of what will be a long-term project. Plans for 2014 are to conduct a series of demonstration milpa burns in early dry season, and continue with intermediate and advanced fire management training with the ultimate goal of creating community-based fire brigades. Equipment has been purchased for the Southern Belize Fire Working Group and a cache is being built for eventual distribution to the organized brigades.



Forest concessionaire Dale Gomez  
demonstrates fire ignition techniques

*Photo: Lee McLoughlin*

## A brighter future for rosewood

Rosewood (*Dalbergia stevensonii*) has undoubtedly become one of Belize's major talking points in recent years and 2013 was no exception. The year got off to a dramatic start when the Minister of Forestry, Fisheries and Sustainable Development set light to a stockpile of export quality rosewood flitches (squared-off logs). It was an extremely bold move that divided opinion across the country.

Many saw only the "senseless waste" as thousands of dollars of lumber went up in flames but others understood the symbolism of the act and the reasons behind it. With the event aired on national television, and the Ministers firm stance against corruption and illegal logging, the rosewood situation was well and truly exposed. This prompted greater vigilance across the Toledo district with regard to reporting occurrences of illegal logging, and there has been a noticeable increase in the coordinated efforts of both the Forest Department and the police in dealing with these crimes.

At the 16<sup>th</sup> Conference of the Parties for the Convention on International Trade in Endangered Species (CITES) in March 2013, proposals were put forward to list over 40 *Dalbergia* species under Appendix II. This included species from South East Asia and Madagascar as well as *D. stevensonii*, *D. retusa* and *D. granadillo* – three valuable species found in Central America. In general, timber proposals received overwhelming support and all were adopted by consensus.

This represents a significant shift in attitudes towards the conservation & sustainable use of timber species in many parts of the world and as demand for exotic timber from the Asian market continues to grow, it seems likely that more tree species will be on the agenda at the next Conference of the Parties in 2016.

Any range country wanting to export an Appendix II CITES-listed species must be able to demonstrate 'Non-Detriment Findings'. The appointed in-country Scientific Authority (a team of independent experts) must be able to demonstrate that the species in question has been harvested in a way that is not detrimental to the remaining population.

This is no easy task and Ya'axché will continue to advocate for measures that will help ensure the sustainable use of one of Belize's most valuable timber species. A long-awaited and much-needed inventory of standing stocks in the Toledo district is due to commence in January 2014. This will be a major step in gathering data that will inform a sustainable use plan.

Non-Detriment Findings cannot be based on stock levels alone and must also take into consideration biological and ecological information. There is a significant gap in this area of knowledge. Rosewood – and many other timber species in the *Dalbergia* genus – is in desperate need of research.



Illegally harvested rosewood goes up in flames.

*Photo: Gail Stott*

Through a collaboration with Fauna and Flora International's Global Trees Campaign, Ya'axché is developing a long-term monitoring program for rosewood trees in the Golden Stream Corridor Preserve. We are currently focusing on growth rates, flowering & fruiting times and propagation trials but hope to develop our research into a more comprehensive study that will include population dynamics, microhabitat assessments and an investigation of associated species.

As we head into the dry season, Ya'axché's Protected Areas Management team will be on high alert with regard to protecting rosewood trees in the Golden Stream Corridor Preserve. Not only could this area provide one of the last remaining strongholds for the species in Toledo, the trees we study could hold the key to an effective conservation and sustainable use plan for what has become one of Belize's flagship species.

# Monitoring and Research

## Monitoring

After an extremely busy year in 2012, with many additions to the Biodiversity Research Inventory and Monitoring programme, it was a priority in 2013 to invest time in the processing of data and ensuring trustworthy results from these efforts. After all, a monitoring scheme without reliable output can hardly be considered as such.

2013 transect monitoring efficiency reached close to 100%, with over 1000 birds and close to 300 mammals observed by sight, sound or signs, and data was directly entered into Ya'axché's transect database. Significant efforts were made as well for other valuable indicator taxa. An additional snail-monitoring plot was established in the Golden Stream Corridor Preserve, while the snails collected in Bladen Nature Reserve last year were identified and the data analysed. Species information from the two one-hectare vegetation plots established in Bladen has been gathered throughout the year and will be completed in 2014. The acoustic monitoring of bats continued at the transect monitoring locations, and Ya'axché's freshwater ecologist has continued to work on an identification key for freshwater invertebrates to be used as water quality indicators. The opportunistic camera trapping efforts during 2012 were followed by a more concise and directed survey in 2013 in collaboration with Panthera, aimed at estimating the minimum jaguar population size in the Maya Golden Landscape. Additional camera traps were used to gather preliminary data on large mammal species diversity in agroforestry farms and around a Mennonite carcass dump.

Two automated weather stations were deployed with great effort to the remote regions of Bladen Nature Reserve in the last quarter of 2012 and were visited in the 3rd quarter of this year to collect the recorded information. However, upon arrival, we discovered that the Oak Ridge station had been stolen - despite our best efforts to locate it at a safe and hidden location. Xateros (those who harvest the leaves of the xaté palm) or gold panners operating illegally near the Maya Mountain Divide are suspected. The Esmeralda weather station was damaged by a flash flood and had to be repaired in the USA.

The results of all monitoring activities in 2012 were published in Ya'axché's annual Biodiversity Synthesis Report (to be found in the 'Resources' section of yaaxche.org). The data for 2013 will be reported in the first half of 2014.

With the increasing activity load in the biodiversity monitoring section, a number of additional staff positions were created. Firstly, Ya'axché recruited a promising student from the University of Belize as a Biodiversity Monitoring and Education Intern, to take on the camera trapping survey and oversee the functioning of the Community Birding Clubs that were established in several villages with support of Ya'axché in 2011.



Ranger Tut examines this pupae cast during butterfly identification training.

Photo: Lee McLoughlin

Ya'axché started working with interns because they have a triple benefit; the intern develops his or her personal skills and enhances their career prospects, the pool of capable young Belizean conservationists grows, and Ya'axché's capacity to conduct its wide-ranging activities is increased. For the second new position, one of our highly skilled ranger team was selected to take on the role of Monitoring Assistant Ranger. This position was designed to ensure more accuracy in recorded patrol and monitoring data, and also to ensure better care and maintenance of the equipment used by the ranger team.

As further proof of the skills of our ranger team, Ya'axché's bird expert (Victor Bonilla) was given three months out from his ranger duties to oversee the fieldwork component of a first-of-its-kind three-month survey of migratory raptors based at Cattle Landing village near Punta Gorda, Toledo District. Many raptors migrate from North America via the isthmus to South America, along which Belize is one of the funnel points.

## Research

As manager of two protected areas, Ya'axché welcomes all efforts to find out more about the biological, archaeological and socio-economic value of these areas and their surroundings. Any new information might help us redirect our management efforts and ensure a more comprehensive Integrated Landscape Management approach. 2013 has seen a number of such opportunities with researchers from different disciplines and continents showing interest in the Maya Golden Landscape.

We received a report on a rapid multi-taxa assessment of an area deep in the forests of the Maya Mountains named Oak Ridge,

after the many tall oaks in the canopy. The expedition was led by Copperhead Environmental Consulting (USA) in collaboration with the Belize Foundation for Research and Environmental Education (BFREE) and Ya'axché, and focused on plant, bat and land snail diversity in a wet, high-altitude forest environment unique to Belize. The expedition discovered many undetermined species of plants and snails, and a reasonable richness in bat species. The full report can be found in the 'Resources' section of yaaxche.org.

The South Wales Caving Club have been active in cave exploration in Southern Belize since 2001 and conducted a review of unexplored and data deficient cave systems in the Bladen Nature Reserve and other areas along the foothills of the Maya Mountains. They investigated 30 cave entrances, some of which proved to be part of much larger systems, possibly explored before but not documented. The expedition included an archaeology survey that discovered a number of ancient artefacts such as shells, pottery shards and grinding stones.

A research team from University of California Davis has been investigating coupled carbon, nitrogen, and phosphorus cycles on volcanic and limestone substrata in the Bladen Nature Reserve. A preliminary report suggests that phosphorus availability in the soil may determine nitrogen fixation in the soil, which is the principal nitrogen input to natural ecosystems. This indicates that phosphorus may be the ultimate constraint on productivity and carbon sequestration in tropical ecosystems.

Further research was conducted in the Quebrada de Oro valley (Bladen Nature Reserve) by Marc Abramiuk - who was part of the extensive Maya Mountain Archaeological Project in the 1990's. In the quest to find as yet undiscovered stelae (upright carved stone slabs), he discovered housemounds and a causeway linking some

of the previously known structures in the area, likely to be from the Late Classic Period, c. 900CE. Unfortunately, he also documented intense looting over recent years, including an intact tomb that had been completely stripped. This information will guide our management strategies.



New species of freshwater macroinvertebrate,  
*Potamocoris isbiru*, discovered by Rachael Carrie,  
Anignazio Makin and Octavio Cal.

Photo: Dan Polhemus

## Staff

The list below represents staff (past and present) that have contributed to Ya'axché's achievements throughout 2013. As of January 2014, Ya'axché employs 24 full time staff. Volunteers, indicated by an asterisk, fill key positions in the organization.

<b>Christina Garcia</b>	Executive Director
<b>Ivanny Oliva</b>	Finance Manager
<b>Maximiliano Caal</b>	Program Support Officer
<b>Bartholomew Teul</b>	Community Outreach & Livelihoods Program Manager
<b>Kenny Cal</b>	Agriculture Extension Coordinator
<b>Renita Choc</b>	Agriculture Extension Officer
<b>Julio Chub</b>	Education & Outreach Coordinator
<b>Helena Ström*</b>	Education & Outreach Officer
<b>Jaume Ruscalleda*</b>	Sustainable Land-use Officer
<b>Miguel Coc</b>	Nursery Technician
<b>Stacy Armbruster*</b>	Project Manager
<b>Lee McLoughlin*</b>	Protected Areas Manager
<b>Maarten Hofman*</b>	Research Coordinator
<b>Olatz Gartzia*</b>	Assistant Research Coordinator
<b>Allan Romero</b>	Biodiversity Research & Monitoring Intern
<b>Gail Stott</b>	Botanist
<b>Roberta Kamille Pennell</b>	Head Development Officer
<b>Fabienne Lefevre*</b>	Development Officer
<b>Vian Rajabzadeh*</b>	Development Officer
<b>Tom Pienkowski*</b>	Development Officer
<b>Erik Hammar*</b>	Marketing and Communications Coordinator
<b>Marchilio Ack</b>	Head Ranger
<b>Victor Bonilla</b>	Ranger, specialized in birds
<b>Octavio Cal</b>	Ranger, specialized in freshwater monitoring
<b>Anignazio Makin</b>	Ranger, specialized in freshwater monitoring
<b>Mateo Rash</b>	Ranger and licensed tour guide
<b>Rosendo Coy</b>	Ranger and licensed tour guide
<b>Vigilio 'Dilo' Cal</b>	Ranger, specialized in navigation
<b>Marcus Tut</b>	Ranger, specialized in snail monitoring
<b>Marcus Cholom</b>	Ranger, specialized in snail monitoring
<b>Zaccheus Cal</b>	Ranger, specialized in vegetation monitoring
<b>Pastor Ayala</b>	Ranger, specialized in freshwater monitoring

## Funders and Partners

Ya'axché would firstly like to thank its institutional partner, Fauna & Flora International, for their support over the years.

Ya'axché would also like to thank all those who have supported and contributed to our work throughout 2013:

- United States Fish & Wildlife Service: Wildlife Without Borders – Latin American and the Caribbean
- Tapir Conservation Group Conservation Fund
- Secretaria General Del Sistema EEP
- German Embassy (Guatemala)
- Global Environment Facility – Small Grants Programme
- Global Trees Campaign
- Rufford Small Grants
- Fondation Frank Linia
- Nicolas Hulot Foundation
- Acacia Conservation Fund
- Iara, Lee & George Gund III Foundation
- Protected Areas Conservation Fund
- Flagship Species Fund
- New England Biolabs Foundation
- Anglo American
- Gesellschaft für Internationales Zusammenarbeit – Caribbean Aqua-Terrestrial Solutions

- Belize Conservation Nature Fund
- Red SICTA (Sistema de Integración Centroamericano de Tecnología Agrícola)
- Rufford Foundation
- Big Lottery Fund
- Disney World Wide Conservation Fund

## Partner Organizations

- Association of Protected Areas Management Organizations
- Belize Association of Private Protected Areas
- Belize Foundation for Research and Environmental Education
- Belize Defense Force
- Ministry of Forestry, Fisheries and Sustainable Development
- Maya Mountain Cacao
- Sarstoorn Temash Institute for Indigenous Management
- Toledo Cacao Growers Association
- Toledo Development Corporation
- Toledo Institute for Development and Environment

# Financial Statement

1st January to 31st December, 2013

## REVENUE

### Grant Revenue

Flex Funds	80,112.92
PACT FOUNDATION 2012	1,950.00
WWB-USFWS	17,009.61
TSGCF-HoustonZoo	3,953.00
Scholarship Funds	2,323.05
Secretaria General Del Sistema-E	19,274.41
German Embassy	5,862.15
SGP-GEF	39,353.20
Rufford Small Grants	71,939.01
Franklina (GTC) 2013	124,062.42
Nicolas Hulot Foundation	19,890.41
Acacia	50,663.63
Lee & Gund	16,402.26
PACT Medium Sized Grant 2013	101,011.43
Flagship Species 2013	26,388.52
NEBF Biolabs 2013	14,440.43
Anglo American Fund	4,985.48
Blue Turneffe Funds	58,874.32
FFI Institutional Agreement 2013	12,077.29
GIZ GRANT 2013	327,115.78
BCNF-PACT	37,050.00
RED SICTA	46,209.33
RUFFORD 2013	31,813.00
Big Lottery Fund (BLF)	7,747.82
Disney Fund	44,865.85
<b>Total GRANT REVENUE</b>	<b>1,165,375.32</b>

**EXPENSE****Salaries**

Salaries	350,319.14
Social Security Tax Expense	15,135.63
Extended Healthcare Expense	17,445.06
Total Salaries Expense	382,899.83

**Core Activities Expenses**

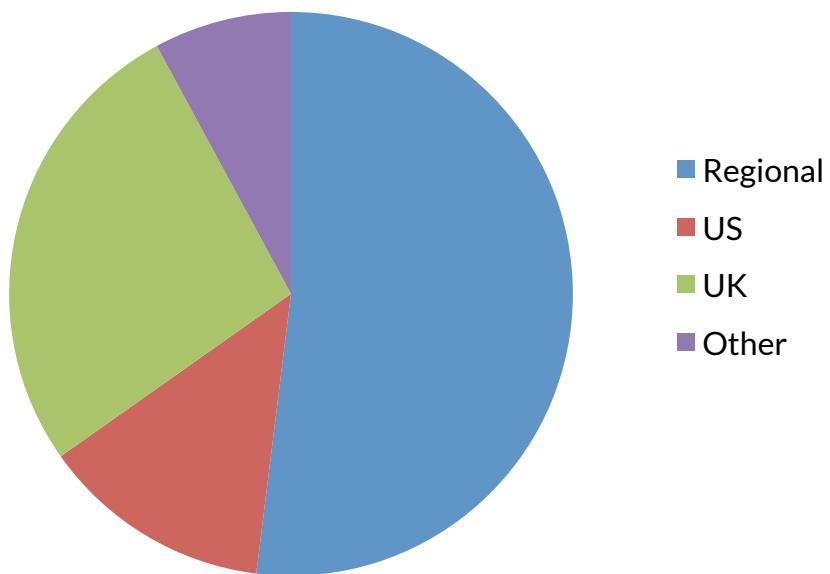
Advertisement & Promotion	16,564.25
Building Maintenance	936.95
Capacity Building	218.00
Communications	16,413.26
Dues & Subscriptions	515.00
Equipment: Maintenance	2,179.48
Equipment: Rental	110.00
Interest & Bank Charges	4,986.18
Legal Fees & Professional Fees	0.00
Office Space	24,107.83
Office Supplies	7,734.18
Staff Appreciation	10.58
Stipends & Allowances	64,829.80
Training & Development: Staff	659.75
Transportation	39,932.39
Total Core Activities Expenses	179,197.65

**Program Expenses**

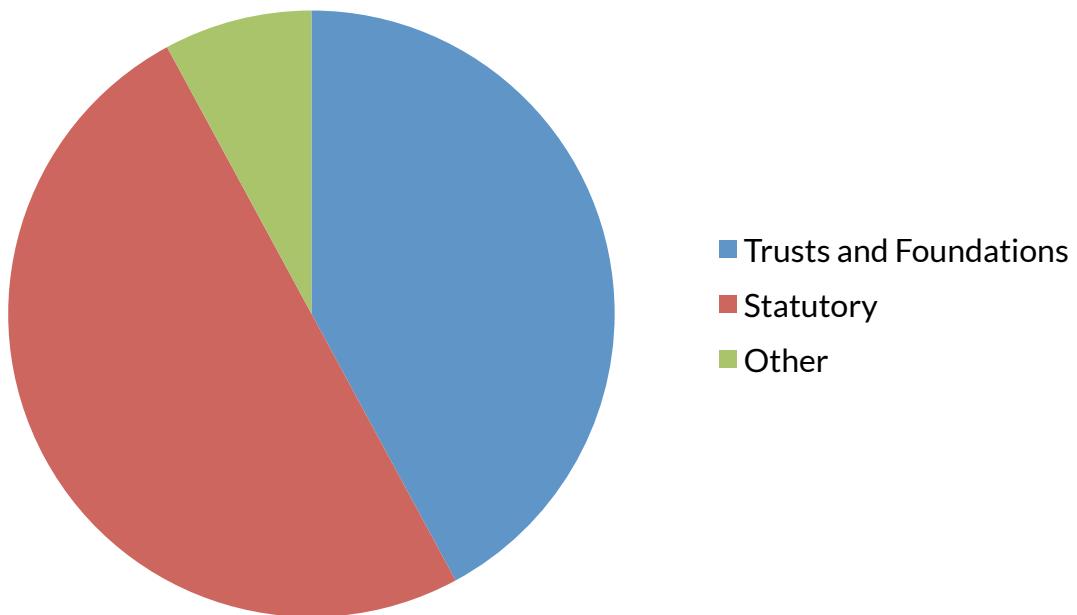
Equipment: Maintenance	153.00
Equipment: Rental	1,805.00
Materials & Supplies	63,644.44
Nursery	19,776.77
Food Allowance	5,656.82
Field Supplies	20,938.55
Workshop Activities	33,573.06
Scholarships	4,639.55
Stipends & Allowances	40,534.75
Sundry	10,510.36
Professional Fees/Consultants	72,126.15
Training & Development: Staff	405.00
Transportation	1,801.58
Fuel	13,766.75
Vehicle License & Insurance	3,239.99
Vehicle/Motorcycle Maintenance	3,876.25
Total Program Expenses	296,448.02

<b>Capital Expenses</b>	
Vehicle	79,160.01
Buildings	19,187.73
Office Equipment	8,635.42
Fixtures & Furnitures	1,030.00
Field Equipment	161,081.69
 Total Capital Expenses	 269,094.85
 <b>TOTAL EXPENSE</b>	 1,127,640.35
Revenue less Disbursements	37,734.97
	=====

## Geographical source of funding



## Funding sources





**Ya'axché Conservation Trust**  
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Belize

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