



# Annual Report 2014

Ya'axché Conservation Trust

Punta Gorda | March 2015

### Cover page

Painted Treefrog (*Hyla picta*)

Photo: Kevin Wells

### Back page

Keel-billed Toucan (*Ramphastos sulfuratus*)

Photo: Erik Hammar

### Maps

All maps prepared by Jaume Rusalleda.



# Annual Report 2014

## Ya'axché Conservation Trust

Punta Gorda, Belize - March 2015

### Editors

Maximiliano Caal  
Kamille Pennell  
Jenny Wain

### Contributing authors

Christina Garcia  
Ivanny Oliva  
Kamille Pennell  
Jaume Rusalleda  
Julio Chub  
Kenny Cal  
Lee Mcloughlin

### Design & Layout

Erik Hammar

Copyright © 2015 Ya'axché Conservation Trust

### Ya'axché Conservation Trust

22 Alejandro Vernon Street, P.O. 177  
Punta Gorda, Toledo District  
Belize

**Phone:** (+501) 722-0108

**Fax:** (+501) 722-0108

**E-mail:** [info@yaaxche.org](mailto:info@yaaxche.org)

**Web:** [yaaxche.org](http://yaaxche.org)



The Kinkajou (*Potos flavus*), a nocturnal mammal, here photographed in Golden Stream Corridor Preserve.

Photo: Kevin Wells



# THE MAYA GOLDEN LANDSCAPE

## MAYA MOUNTAINS

GUATEMALA  
BELIZE



- Villages
- Highway
- Rivers
- MGL
- Protected Areas





Maturing cacao pods, and flowers.

Photo: Erik Hammar

# TABLE OF CONTENTS

---

List of acronyms	8
From the Executive Director	9
Strategic plan	10
Institutional structure	11
<b>Community Forest Concession</b>	<b>12</b>
<b>Community Outreach &amp; Livelihoods</b>	<b>15</b>
Agroforestry	15
Alley Cropping	15
Leadership training	16
Nursery expansion	16
Staff capacity building	18
Race Against Fire	18
Farmer of the Year Award	18
<b>Land-use change</b>	<b>20</b>
Inter-annual variability 2013-2014	22
<b>Protected Areas Management</b>	<b>25</b>
Program strengthening	27
Partnerships	27
Compliance	28
Golden Stream Corridor Preserve	28
Bladen Nature Reserve	30
Maya Mountain North Forest Reserve	30
Belize Ranger Training Academy	30
<b>Monitoring &amp; Research</b>	<b>32</b>
Biodiversity monitoring	32
Indicator species	33
Freshwater monitoring	35
<b>Staff</b>	<b>36</b>
<b>Funders &amp; Partners</b>	<b>37</b>
<b>Financial statement</b>	<b>38</b>

Black Iguana (*Ctenosaura similis*).

Photo: Erik Hammar

## List of acronyms

APAMO	Association of Protected Areas Management Organizations
BAPPA	Belize Association of Private Protected Areas
BAS	Belize Audobon Society
BCP	Bat Conservation Programme
BDF	Belize Defense Force
BFREE	Belize Foundation for Research and Environmental Education
BNR	Bladen Nature Reserve
BPD	Belize Police Department
BRIM	Biodiversity Research Inventory and Monitoring
BRTA	Belize Ranger Training Academy
BTB	Belize Tourism Board
CBD	Convention on Biological Diversity
CBWS	Cockscomb Basin Wildlife Sanctuary
CCCCC	Caribbean Community Climate Change Center
COL	Community Outreach and Livelihoods
CRFR	Columbia River Forest Reserve
DRFR	Deep River Forest Reserve
FCD	Friends for Conservation Development
FD	Belize Forest Department
FFI	Fauna & Flora International
FOYA	Farmer of the Year Award
FSF	Flagship Species Fund
GEF SGP	Global Environmental Facility Small Grants Program
GIS	Geographic Information System
GIZ	Gesellschaft für Internationale Zusammenarbeit – Caribbean Aqua-Terrestrial Solutions
GSCP	Golden Stream Corridor Preserve
GTC	Global Trees Campaign
IAF	Inter American Foundation
IICA	Inter American Institute for Cooperation on Agriculture
IRF	International Ranger Federation
LULC	Land Use/Land Cover Change
MFFSD	Ministry of Forestry, Fisheries and Sustainable Development
MGL	Maya Golden Landscape
MMC	Maya Mountain Cacao
MMNFR	Maya Mountain North Forest Reserve
NBMP	National Biodiversity Monitoring Plan
NEBF	New England Biolabs Foundation
NGO	Non Governmental Organization
NHF	Nicolas Hulot Foundation
NPAS	National Protected Areas System
NTFP	Non Timber Forest Products
NTPPAM	National Training Program for Protected Areas Managers
PACT	Protected Areas Conservation Trust
PAM	Protected Areas Management
PHMR	Port Honduras Marine Reserve
RAF	Race Against Fire
RELCOM	Latin America Network for Bat Conservation
RFAD	Ranger for a Day
SATIIM	Sarstoon Temash Institute for Indigenous Management
SBBC	Southern Belize Biological Corridor
SBFWG	Southern Belize Fire Working Group
SHI	Sustainable Harvest International
SMART	Spatial Monitoring and Reporting Tool
SPEECH	Social Political Environmental Economic Health
TADA	Toledo Agricultural Development Alliance
TCGA	Toledo Cacao Growers Association
TDC	Toledo Development Corporation
TFCGA	Trio Farmers Cacao Growers Association
TIDE	Toledo Institute for Development and Environment
UB-ERI	University of Belize - Environmental Research Institute
UNDP	United Nations Development Programme in Belize
USA	United States of America
USFWS WWB	United States Fish & Wildlife Service: Wildlife Without Borders

## From the Executive Director

It gives me great pleasure to share our achievements for the year 2014. Gradually the organization has grown and expanded its work to other areas; including the addition of new communities as part of the wider Maya Golden Landscape.

Our work expansion has led to the acquisition of more funding opportunities but at the same time allowed us to reflect on our strategic planning which has prepared us to carry on with our mission of developing capacity for the wise use of land and natural resources.

Due to the hard work that all have been involved with over the past year we have been able to hire additional staff including an operations manager and an education and outreach officer. The additions to the Ya'axché family will definitely boost the level of work in the buffering communities in the coming years.

2014 has not been an easy year for Ya'axché, for we were faced with many challenges; nonetheless we excelled in our achievements and deliverables. One of the most remarkable accomplishment was the establishment of the first ever community forest concession in Maya Mountain North Forest Reserve with the Trio Farmers Cacao Growers Association. This could clearly set the precedent in Belize for other communities to be engaged in similar community forest agreements.

Ya'axché has taken a major leap towards becoming financially sustainable by establishing several initiatives like Ranger for a Day, hosting student groups, and the Belize Ranger Training Academy. Ya'axché has established a business to promote ecotourism in the Golden Stream Corridor Preserve as an additional source of income that will go towards the salaries of rangers and other staff.

There are so many things to boast about but I will leave you to enjoy our 2014 accomplishments through this annual report. I also take the opportunity to commend donors, members, board of directors, staff and volunteers of Ya'axché for their support, dedication and hard work.

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 2015 to 2017 was finalized in December 2014 and includes updated mission 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

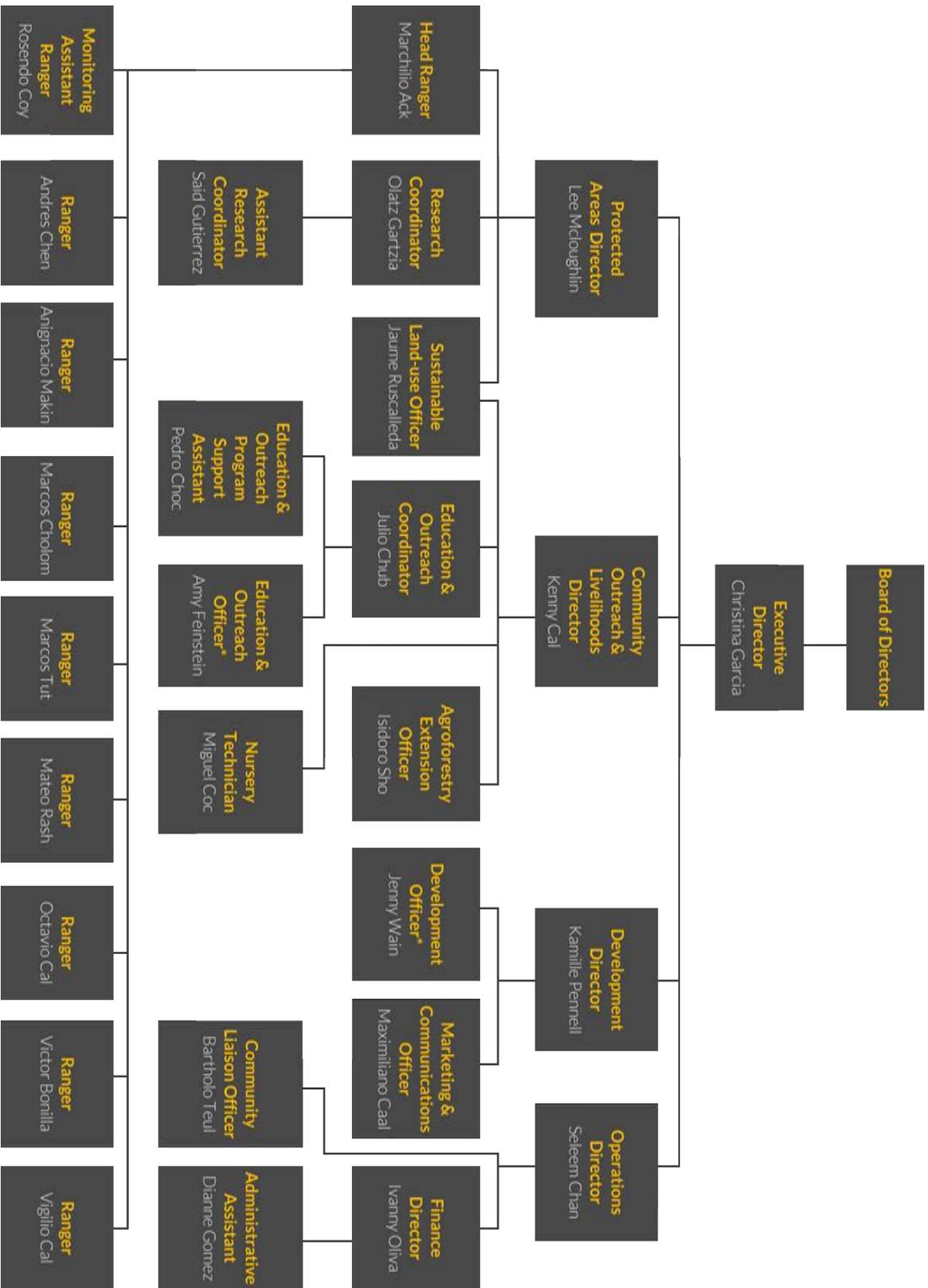
Ya'axché is a Belizean organisation which aims to maintain a healthy environment with empowered communities by fostering sustainable livelihoods, protected area management, biodiversity conservation and environmental education within the Maya Golden Landscape.

### Organizational values

Ya'axché works with...

- Integrity
- Respect
- Professionalism

# Institutional structure



# Community Forest Concession in MMNFR

## A community approach

Since May 2012, Ya'axché has been working with the Trio Farmers Cacao Growers Association (TFCGA) of Trio village, in Toledo, concerning their intention to establish a cacao-based agroforestry system within the Maya Mountain North Forest Reserve (MMNFR). As a critical buffer to the Bladen Nature Reserve, the advance of illegal slash and burn and cattle agriculture into the MMNFR was of great concern to Ya'axché and the Forest Department. In order to address this Ya'axché began investigating the use of community forest management and economically productive buffer forests to halt this advance. Examples from elsewhere in the region (Honduras and Guatemala) have been followed to develop a community conservation agreement model for Belize.

Despite this early start it was not until this June that Ya'axché finally managed to secure a signed community forest concession for the TFCGA. Two years of lobbying the Ministry of Forestry, Fisheries and Sustainable Development has resulted in the granting of Belize's first dedicated agroforestry concession. The concession agreement was drafted in conjunction with the Forest Department, Trio Farmers Cacao Growers Association and Ya'axché Conservation Trust and involved extensive consultations.

The final remaining step was the development of a management plan, which was submitted in November. The approval of this plan, a condition of the permit, will enable the TFCGA to work alongside logging concession holder to prepare the

concession for the sustainable production of cacao and annual crops.

A major risk was that despite the best of intentions more damage could be incurred to the MMNFR than benefit, as a result Ya'axché has conducted surveys to gather information and collect a baseline from which to measure positive or negative impact.

- 1) A socioeconomic survey tool, SPEECH, was piloted to gather information on baseline indicators such as education, employment, culture and health, more than 50% of the whole Trio community was measured;
- 2) Ya'axché's biodiversity monitoring program was expanded to examine trends and collect initial baseline assessments of birds;
- 3) Tree species stock inventory and abundance was measured to determine economic and conservation value;
- 4) Topographical and ecosystem mapping (remote sensing and ground transect) was conducted to identify ideal plot arrangement;
- 5) Soil sampling was conducted to assess the suitability of soil and avoid unnecessary ecosystem alteration.

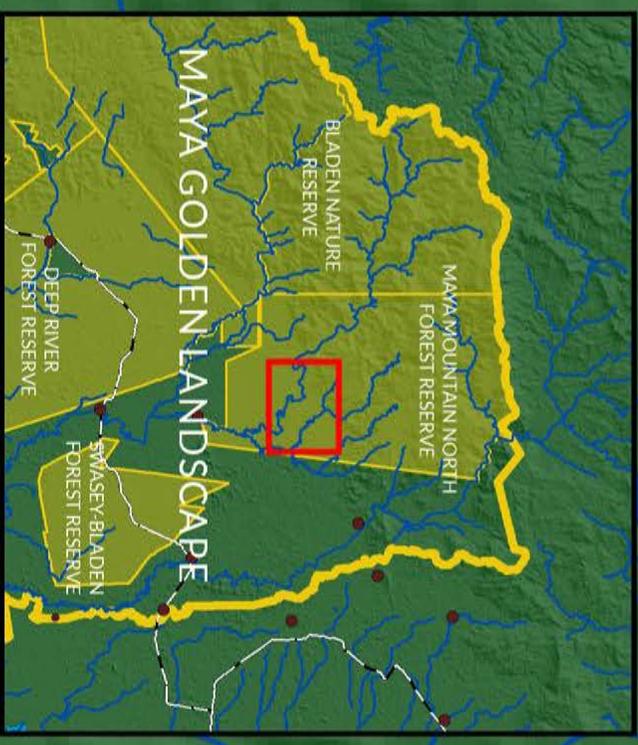
# AGROFORESTRY CONCESSION IN THE MMNFR



MAYA MOUNTAIN NORTH  
FOREST RESERVE



-  Concession
-  Agroforestry plots
-  Rivers and Creeks
-  Existing roads



The primary crops proposed for the concession are shade-grown coffee and cacao (350 acres), and organic maize and beans using the *matahambre* and Inga alley cropping system (105 acres). The markets for these crops have been thoroughly investigated and will supply local, national and international demand. Cacao in particular demonstrates a steadily growing demand which far exceeds the production capacity of Belize. Ya'axché will help the TFCGA to secure the best possible prices for their products and to build capacity in farm management, business management and leadership with a view to supporting a fully independent cooperative which contributes to community development, watershed protection and an improvement in socio-economic indicators.

If this model is successful it can provide a workable solution to the concession and the increased attention that will result will help to tackle the currently high rates of illegal resource extraction, forest degradation and deforestation, and systems will be put in place that will improve the protected area management effectiveness and contribute to Belize's commitments as a signatory to the Convention on Biological Diversity.

## Community Outreach & Livelihoods Program

2014 has swiftly gone and The Community Outreach and Livelihoods (COL) team is proud to share its achievements for the year. The team's work has extended to more villages across the Maya Golden Landscape. We now work with nine communities including Trio, Bladen, Medina Bank, Golden Stream, Indian Creek, Big Falls, Silver Creek, San Miguel and San Pedro Columbia. These communities have benefitted from programs focused on education and outreach, sustainable agriculture/best agricultural practices, local governance, community forest management, and accessing secondary education. The team awaits 2015 with great enthusiasm and a positive mindset. We guarantee it will be an exciting and productive year.

### Agroforestry

2014 saw a higher interest in agroforestry from farmers. In fact, there was an increase from 83 farming families implementing agroforestry in the MGL in 2013 to 125 in 2014. This demonstrates that more farmers understand the importance of diversifying farms. Agroforestry still remains the most outstanding livelihood opportunity for farming communities; therefore, Ya'axché strongly encourages and promotes this alternative farming method. Ya'axché has made great effort to support agroforestry farmers to ensure their success. Therefore, Ya'axché offered trainings sessions to community members on grafting of cacao trees, selection of quality buds, selection and tagging of high yielding trees, pruning, plot designs and planning.

Training sessions followed two main approaches: a peer-to-peer training approach whereby farmers share information, lessons learnt and expertise and a formal training approach whereby Ya'axché experts share methods, best practices and benefits of practices. In addition, farmers participated in 5 exchange visits to productive agroforestry farms across the MGL to learn by seeing and doing.

To encourage farmers to implement practices learnt, Ya'axché donated approximately 12,100 saplings to farmers across the MGL, which includes mostly cacao, timber species (mahogany, guanacaste, cedar, banak) and fruit trees, (balam, star apple, soursop, custard apple, and coffee). The COL team remains committed in providing technical support and saplings to farmers.

### Alley cropping

In 2013, Ya'axché supported 15 farmers to participate in a pilot experimental one-acre alley cropping on individual parcels. Farmers used the leguminous species of tree Madre de Cacao (*Gliricidia septium*) and *Inga edullis* to form alleys on contours. The maize was planted in rows measuring 36 inches between rows and 12 inches between plants. The alley cropping method is being promoted and implemented since it helps to improve the soil and provides nutrients, particularly nitrogen, to the crops and therefore, increases crop productivity. In 2014 we have used these established plots as training grounds for other farmers who wanted to learn about the cropping system.

Besides providing technical support, Ya'axché distributed 200 *Inga edulis* seedlings to each farmer implementing the alley cropping method. Ya'axché's technical personnel will be monitoring the plots to determine the productivity of the system; such information will be helpful in promoting this farming method.

### **Leadership training**

As a part of the Community Outreach and Livelihoods Program, Ya'axché strives to provide leadership training to community leaders within the MGL. Communities are only as strong as their leadership capabilities, hence members of the Village Council, Alcalde teams, Water Boards, Parent Teachers Associations, Church leaders and youth leaders have attended these trainings sessions.

Our very own Bartolo Teul, facilitated the leadership trainings that we conducted within the MGL communities. He has designed the workshops to focus on the needs of the leaders. This year's trainings focused on qualities and values of a good leader, how we are governed, democracy, good governance and community participation approaches.

This year, Ya'axché's trainings expanded to include community groups who are seeking to lead community projects within their villages. We will be continuing to support the leaders and communities during 2015.

### **Nursery expansion**

The demand of grafted fruit trees especially cacao is on the rise. Ya'axché, with the support of several donors, has improved its nursery facilities to include a functional mist irrigation system, which has decreased the amount of time needed for watering the plants from almost an entire day to 30 minutes. By using this system, we have seen major changes in plant growth and conservation of water.

The nursery was expanded by 2,928 ft<sup>2</sup>. This expansion has increased the nursery capacity to 55,000 plants. In addition, an Intensive Care Unit that has been built to accommodate 7,500 grafted plants, to ensure plant vigorousness. The improvements to the nursery facilities have allowed three grafting training sessions for farmers.



A sprinkler head in the new and improved nursery at Golden Stream Field Station.

*Photo: Maximiliano Caal.*

## **Staff capacity building**

Ya'axché continues to seek capacity building opportunities for its staff. This year, Ya'axché has partnered with ArtCorp, an organization that provides training guides using creative methods. Five members of the COL team have participated in a two-day session focusing on Creative Facilitation and Creative Collaboration. These training sessions have provided much needed new techniques and methods that will be used to effectively engage communities. Also this year, Bartolo Teul underwent a 20-week Diploma course in Development Leadership at Coady International Institute in Nova Scotia, Canada. This Course has provided much needed tools to effectively and efficiently deliver leadership trainings to community leaders.

## **Race Against Fire**

Our annual Race Against Fire event attracted over 700 attendees to the village of Silver Creek on 19<sup>th</sup> April 2014 and saw 32 riders compete in the race. Kids competed in activities such as the sack race, 3-legged race, watermelon eating contest and lime and spoon. Presentations on fire management were given throughout the event. The theme for the day was "*Fire! If you cannot control it, Don't start it*". The winners of the bicycle race were Alberto Coc (1st), Pedro Xi (2nd), Juan Bah (3rd).

The Parent/Teachers Association (PTA) of Silver Creek village 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.

## **Farmer of the Year Award**

At the end of August, three farmers were rewarded for their efforts in using better agriculture practices in and around the Maya Golden Landscape at our second Farmer of the Year Award. Best practices implemented by the farmers included cacao-based agroforestry, slash and mulch farming and small livestock rearing. The use of chemicals, care for riparian zones, use of cover crops (such as mucuna beans) and passing on of knowledge to children were all taken into consideration during the selection of the winners.

Six 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 and Ya'axché. Winners of the event were Martin Coc (1st) from Indian Creek, Santiago Coh (2nd) and Pedro Saki (3rd), both from Silver Creek.



Race Against Fire 2014.

Photo: Kevin Wells.

## Land use/Land cover change in the MGL

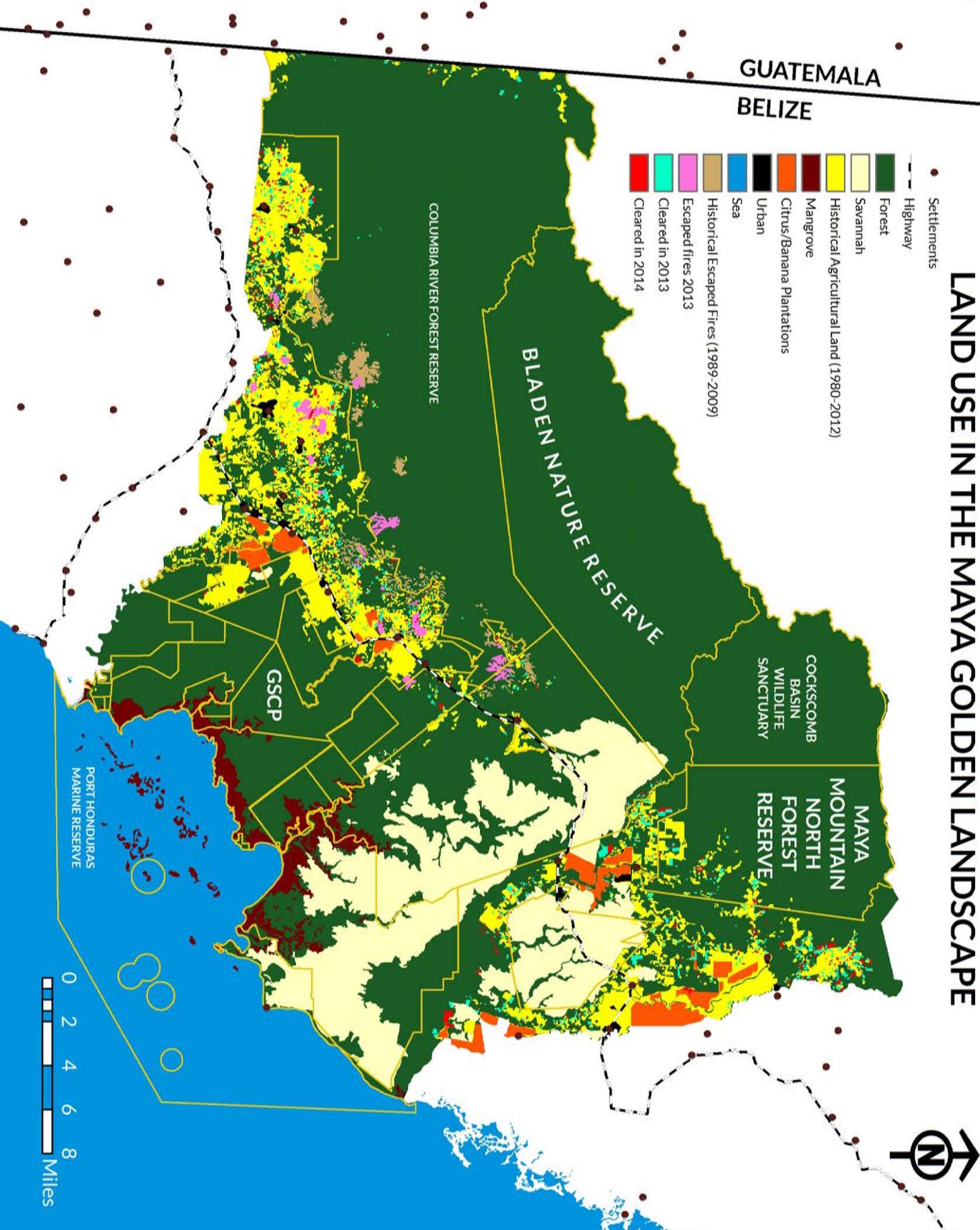
The Maya Golden Landscape is being shaped by communities on a day to day basis. They rely on their surrounding lands to access the agricultural and ecosystem services that support their wellbeing. Of all the interactions with the environment, farming is one of the activities with the greatest impact on the landscape around us. Since 2011, Ya'axché has been looking at land use/land cover (LULC) changes in the MGL caused by farming and related events. We have been looking back to past data and analysing LULC trends between 1980 and 2012 and keeping track of changes since 2012 at a finer scale, all through the use of freely available satellite imagery. More specifically, we have been looking at where vegetation is being cleared for agriculture and the implications for the advance of the agricultural frontier into forests. These are still the dominant land cover in the MGL (65% by 2014), and contain Level 1 Key Biodiversity Areas, as well as the Southern Belize Biological Corridor.

During the last 34 years, traditional Mayan farming, cattle ranching, intensive agricultural plantations and escaped fires have created a complex agricultural mosaic in the MGL. This landscape is made up of actively farmed plots within a mix of recently abandoned fallow plots (formed by *wamil*, which is the local name for a vegetation community dominated by opportunistic, fast growing species), secondary forests (which are the result of longer periods of abandonment), shrub land and riparian vegetation, as well as bare rock (the result of escaped fires on limestone hills). Surrounding these impacted areas, we find forests which have not been farmed in the past, but that are currently being cleared due to the need for new agricultural lands.

In southern Belize, land clearing for traditional Mayan agriculture for staples (corn, beans, and pumpkin, among others) happens in two different seasons. During the dry season (March to June), slash and burn takes place, where vegetation is clear cut to the ground, left to dry and completely burned. This technique has been used for centuries, as it is the most cost and time efficient way of clearing land and gives a quick source of nutrients (through the ashes) for the planted crops. Conditions are mostly hot and dry during this time of the year, and if proper precautions are not taken, escaped fires can burn large areas, causing damage to farms and forests. Slash and burn agriculture happens both in areas that were used in the past and that were left to regrow for a few years (from 5 to 10 years usually) or in forested areas that haven't been yet farmed.

The second period of vegetation clearance for agriculture happens during the months of November and December. Farmers use the slash and mulch method (also known as *matahambre*), which consists in cutting the vegetation and letting it mulch on the soil before planting, as conditions are too wet to use fire at this time of year. Most of the slash and mulch clearance happens within re-growing vegetation from past agricultural use and close to water courses. Through the use of these two farming methods, we have observed an expansion of agricultural areas into forests from 1980 to 2014.

# LAND USE IN THE MAYA GOLDEN LANDSCAPE



GUATEMALA  
BELIZE

- Settlements
- Highway
- Forest
- Savannah
- Historical Agricultural Land (1980-2012)
- Mangrove
- Citrus/Banana Plantations
- Urban
- Sea
- Historical Escaped Fires (1989-2009)
- Escaped fires 2013
- Cleared in 2013
- Cleared in 2014

COLUMBIA RIVER FOREST RESERVE

BLADEN NATURE RESERVE

COCKSCOMB  
BASIN  
WILDLIFE  
SANCTUARY

MAYA  
MOUNTAIN  
NORTH  
FOREST  
RESERVE

GSCP

PORT HONDURAS  
MARINE RESERVE



There are several reasons why farmers are moving into forests in search of new and fertile lands. There is a higher demand for new agricultural land in Toledo due to our fast growing population and high immigration rates, as well as increasing demand for certain agricultural products (corn, pepito seeds and beef, among others) from internal and external markets. In addition, the excessive use of fire and agrochemicals cause soil degradation and erosion, which reduce soil productivity. As a consequence, agricultural areas are being expanded into forests, and ecosystem services provided by these forests, such as water provision, sediment and soil retention, flood regulation, carbon storage and non-timber forest products, are being put at risk.

In order to reduce the amount of forest cleared for agriculture, Ya'axché is promoting agricultural practices that allow farmers that are working in the historical farming areas to use their land for longer periods of time in a productive way. Through agroforestry, Inga alley cropping, row planting, back yard gardening and other organic methods, we aim to maintain and improve soil health and improve agriculture efficiency. By doing so, we will reduce the need to expand agricultural lands into forests, which must be left standing to provide present and future generations with indispensable ecosystem services and be the home to biodiversity.

### **Inter-annual variability 2013-2014**

2013 and 2014 have been the first years to see our LULC analysis applied to the newly expanded MGL area (Figure 1). There is a natural climatic variability between years (which, according to predictions for the Belize region, will be accentuated by climate change in years to come) that has a

certain influence on LULC change trends. The drier a year (specifically in the dry season, March-June), the higher the chances that a larger area will be cleared for agriculture, due to both controlled clearance and escaped fires. If conditions are wetter, farmers are not able to burn so effectively and fires have a lower chance of escaping. 2013 saw one of the driest dry seasons in recent years (based on weather station data and informal reports), which helps us understand why more forest burned compared with 2014, which had a wetter dry season.

Clearance of vegetation for agriculture happened almost equally inside the existing agricultural areas (in matrix) and in untouched forests (out of matrix), both in 2013 and 2014 (Figure 2 and 3). During both years there was a net increase of the agricultural areas in the MGL, and consequently decreased forest cover. Both years presented different deforestation rates: 0.73% of the MGL's untouched forests were lost to agriculture or escaped fires in 2013, whereas 0.30% were cleared for agriculture in 2014 (no escaped fires happened outside the agricultural matrix during this year). Of special interest is the fact that, in 2013 and 2014, among all intentional clearance for agriculture (without including escaped fires), 11% and 8% happened in Protected Areas, mainly the Columbia River Forest Reserve, the Deep River Forest Reserve and the Maya Mountain North Forest Reserve.

The MGL is a largely forested area and holds some of the most important forests in Mesoamerica. An expansion of the agricultural areas into forests will affect the landscape's capacity to provide communities with the essential ecosystem services they need for their wellbeing, and will put at risk Belize's precious biodiversity.

For this reason, in the coming years, Ya'axché, through its Community Outreach & Livelihoods and Protected Area Management programs, will continue to work with communities to prevent forest loss, by improving agricultural practices, reducing escaped fires and protecting and studying forests within the MGL.

Figure 1.

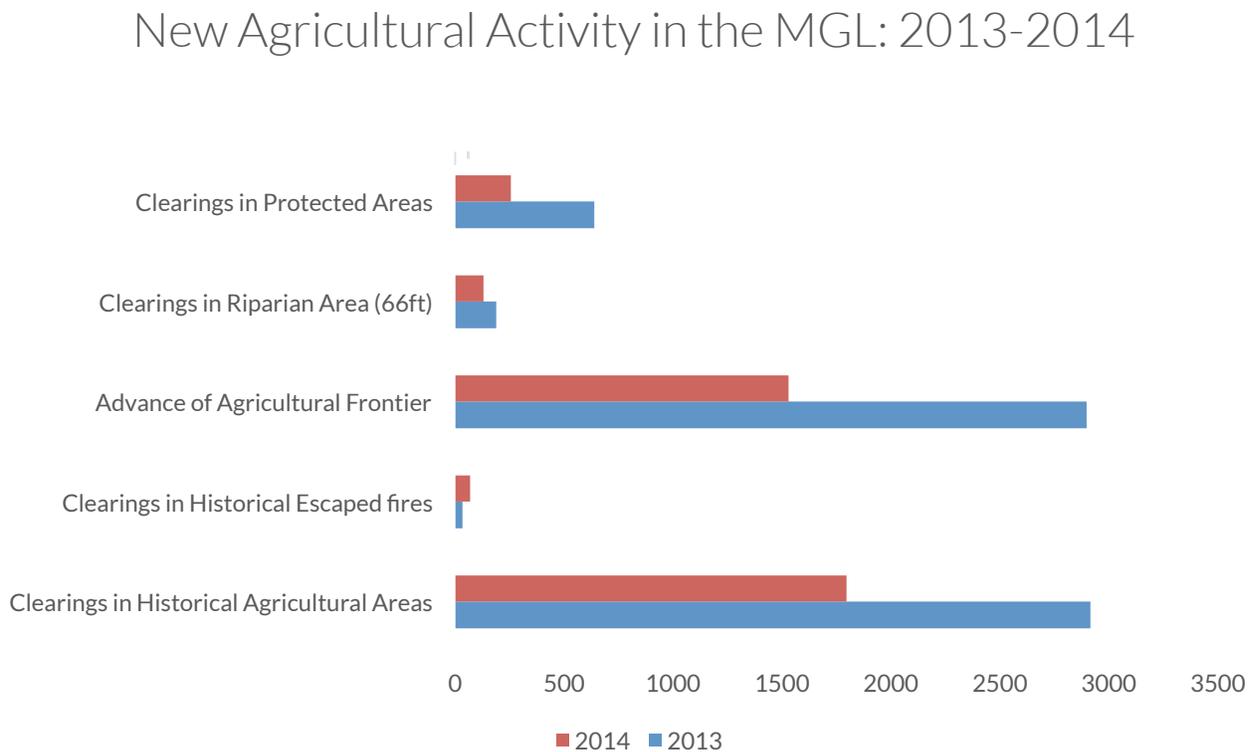


Figure 2.

### New Agricultural Activity Location 2013

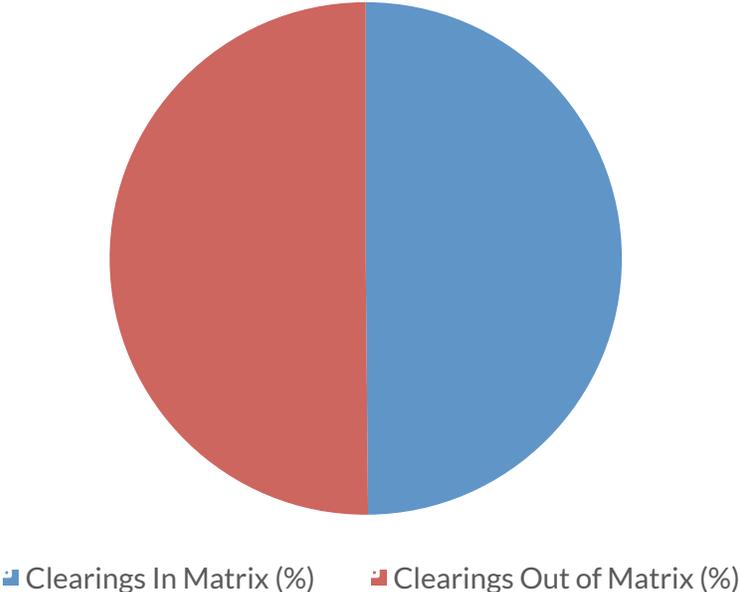
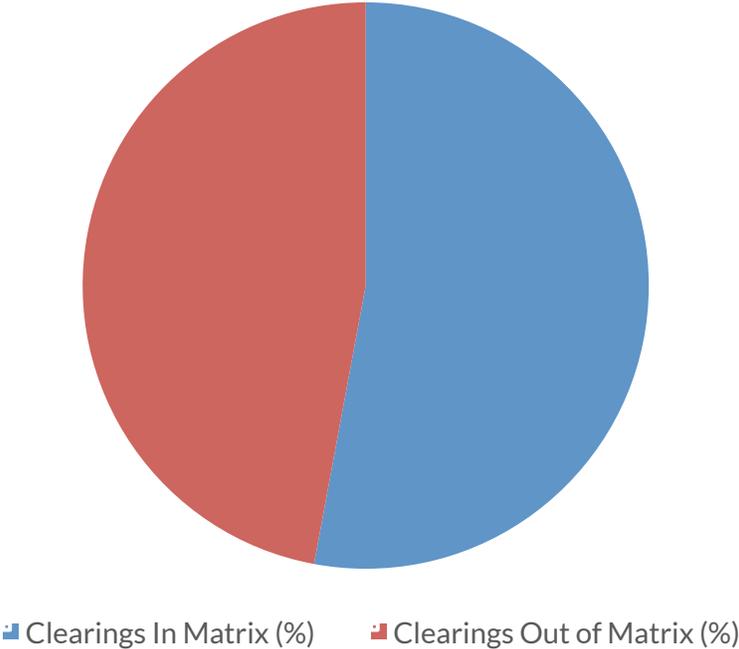


Figure 3.

### New Agricultural Activity Location 2014



## Protected Areas Management program

The Protected Areas Management Program continues to professionalize and steadily integrate techniques, which 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 development of high quality needs-based training, analysis of remotely sensed images to rapidly detect changes in forest cover, the continued piloting of the Spatial Monitoring and Reporting Tool (SMART), building capacity for community management and the refining of 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 PAM 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. Ya'axché is a key participant in the discussions held nationally on the development of the National Biodiversity Monitoring Plan and also in standardized patrol reporting.

Building on 2013 achievements, communications have been maintained and improved through regular (every 10 days) PAM program meetings led by the Head Ranger and weekly management meetings at which major issues are communicated upwards. Applying diverse perspectives, skills and experience continues to lead to better thought out decisions and this remains the central ethos of Ya'axché.



Head Ranger of Ya'axché, Marchilio Ack instructs ranger students during a training session for the Belize Ranger Training Academy.

*Photo: Maximiliano Caal.*

## **Program strengthening**

In order to build the strength of the ranger team it is necessary to build leadership skills. Recognizing this two major actions were taken to identify and mentor the next generation of PAM program leaders. Addressing the need for accountability and oversight of data collection, entry and compilation, the promotion to 'Monitoring Assistant Ranger' of Rosendo Coy has seen a significant improvement in accuracy and a reduction in the amount of lost data from patrols, wildlife logs and transect data.

Secondly, in September, we began the search for team leaders of each of the three ranger teams. All rangers will be given the chance to prove themselves for the promotion, which will be decided in July 2015. Ya'axché is intent on rewarding the hard work of staff with opportunities to build careers.

Ya'axché's Research Branch has been strengthened significantly through the addition of Assistant Research Coordinator, Said Gutierrez and Research Coordinator, Olatz Gartzia. Bringing diverse skills into the research team and allowing for a smooth transition from the departure of esteemed Research Coordinator, Maarten

Hofman, the Protected Area Management Program has been able to develop the Research Branch in accordance with the structure envisioned by Maarten.

## **Partnerships**

Partnerships continue to be key to Ya'axché's effectiveness in the management of protected areas in the Maya Golden Landscape. Beyond the vital relationships maintained and developed with the buffer communities, key partnerships have been maintained and strengthened with the Forest Department, on enforcement, fire management, GIS and remote sensing, and community forest management; with Belize Defence Force on enforcement, security and intelligence; with University of Belize Environmental Research Institute on the Belize Ranger Training Academy and Research Branch Development; with Toledo Institute for Development and Environment on fire management, enforcement, intelligence sharing and education; the Southern Belize Fire Working Group on fire management and enforcement; and the Belize Audubon Society on enforcement, education and intelligence sharing. There are also numerous other partners we would like to thank that cannot all be listed here.

## **Compliance**

Ya'axché's first priority is ensuring that information is disseminated about the location and regulations of protected areas that it manages. Rather than focusing on enforcement alone Ya'axché takes an approach of building compliance, which can be achieved through raising awareness of the implications of illegal activities (penalties, game species decreases) and lead to peer pressure and ultimately facilitate community forest management. As such, compliance is achieved across Ya'axché's programs thanks to education and outreach as much as patrolling and enforcement.

Enforcement does continue to be a key aspect of ensuring the maintenance of biodiversity and the integrity of the last remaining forested corridor link in the regionally important Southern Biological Corridor. Ya'axché's 10 man ranger team, split into three teams of three continues to input an admirable amount of effort into the patrolling of the vast Maya Golden Landscape despite ever decreasing funding, insufficient numbers and equipment. In order to maximize output from these limitations Ya'axché is piloting technology (SMART, GIS) and building partnerships that are expected to increase effectiveness in increasing compliance.

Number of patrols has been maintained at 2013 levels and is thought to be close to the maximum that can be achieved by the ranger team at the current level of responsibilities. Improvements must therefore be made by better targeting of patrols (addressed through SMART) or securing funding for increased manpower, training and equipment.

## **Golden Stream Corridor Preserve**

The nature of illegal activities in Golden Stream Corridor Preserve in 2014 continues to be illegal hunting, non-timber forest product (NTFP) extraction and some very limited illegal timber extraction and escaped wildfire. The extent of this has not increased significantly although there is increasing pressure for illegal extraction of NTFP's, despite Ya'axché's Sustainable Extraction Policy.

To address this, Sustainable Extraction zones will be revised, shared with community and monitored by PAM Research Branch.



Ranger Mateo Rash on patrol in Golden Stream Corridor Preserve.

*Photo: Maximiliano Caal.*

## **Bladen Nature Reserve**

In the eastern and central portions of Bladen Nature Reserve (BNR) Ya'axché has a good understanding of the frequency of illegal activities and the main hotspots due to frequent/moderately frequent patrol visits. The incident reports derived from these patrols helps to guide patrol targets and investigation of new access trails. Illegal activities inside BNR are limited in these areas to game species extraction and freshwater fishing. Only one occurrence of direct contact with illegal hunters was recorded and resulted in the confiscation of firearm and fishing equipment but no arrests were made in 2014.

In Western BNR the situation has been deemed outside of the control of Ya'axché's rangers until adequate equipment (firearms) and training (firearms safety and handling, tactical patrolling techniques and communications) have been secured. Ya'axché is seeking funding in 2015 to satisfy these needs. Communication with partners (BDF and FCD) indicate that in remote areas of Western BNR there is activity surrounding *xaté* extraction, small scale gold mining and illegal hunting.

## **Maya Mountain North Forest Reserve**

Due to recognized threats advancing from two regions of MMNFR, including illegal logging, deforestation (milpa, cattle pasture), settlement expansion and hunting, Ya'axché has added regular and special patrols of the MMNFR to increase the amount of information passing to Forest Department and also to show there is a presence in the area. In addition Ya'axché has provided on-going support and information sharing with the Trio community rangers trained in 2013 and still active in the MMNFR agroforestry concession.

Ya'axché has plans to expand regular patrols in MMNFR in 2015 to address the rapid land use change that is on-going in the reserve and to strengthen this critical remaining buffer to Bladen Nature Reserve.

## **Belize Ranger Training Academy**

The Belize Ranger Training Academy (BRTA) is the first dedicated marine and terrestrial Protected Area Ranger Training Facility for the Central American and Caribbean Region. The vision is to coordinate high quality national and international expertise to expose rangers from Belize and eventually the wider region to the best available protected area management expertise. Through the delivery of a comprehensive curriculum covering the broad spectrum of tasks an effective rangers needs for proficiency, the BRTA is expected to contribute significantly to management effectiveness initially in Belize and subsequently, the wider region.

Arising out of a concept developed in 2009 the BRTA has been developed in collaboration with national and international ranger training experts including the Police Department, Belize Defence Force, The University of Belize Environmental Research Institute (UB-ERI), Colorado State University, and United States Fisheries and Wildlife Service.

An extensive needs assessment conducted amongst protected area managers and stakeholders across Belize ensured that the curriculum was developed in a participatory manner with numerous opportunities for revision before finalization.

In 2014, thanks to funding from Protected Areas Conservation Trust (PACT) and in partnership with UB-ERI, facilitators of the National Training Program for Protected Area Managers (NTPPAM), Ya'axché was able to conduct the first pilot of the full Level 1 course. This course is made up of three modules, each around 12 days in duration.

In Module 1, the participants were exposed to a contextual background of ecology, geography, global and national conservation and protected area history, followed by Module 2 which comprised practical field skills including monitoring techniques, navigation, trauma medic, survival and fire management. Finally, in Module 3, the trainees were put through a Police Department accredited Law Enforcement Training which hones their enforcement, prosecution, firearms, patrol tactics and conflict resolution skills.

The curriculum developed to date (2014) is for entry level rangers, and is intended to be the first of three levels of accreditation. UB-ERI has agreed in principle to provide formal institutional accreditation for the Academy and credits earned will be valid for Associates Degree entrance. On an international level the International Ranger Federation has formally endorsed the curriculum and future exchanges with African and Asian initiatives can strengthen the global network.

One of the key questions challenging contemporary initiatives globally has been that of financial sustainability. The BRTA will address this in three ways; 1) continuing to seek donor support from multiple statutory and private sources including sustainable funds from national protected areas funding mechanism PACT; 2) attracting paying private sector and private individuals to study at the Academy, 3) setting up a supporting for-profit business which will attract student groups and ecotourists and whose profits will be directed to the BRTA, as a not for profit entity.

With partners including UB-ERI, Ministry of Forestry Fisheries and Sustainable Development, Ministry of National Security, Belize Tourism Board and the International Ranger Federation, the platform of support is strong. Ya'axché is proud of this contribution to the management effectiveness of Belize's National Protected Areas System.

# Monitoring and Research

## Biodiversity monitoring

As last year, we have continued good-quality analysis and reporting of our biodiversity monitoring activities in the MGL, hence, in the first half of 2014, we produced the 2013 Biodiversity Synthesis report. This continued the efforts made during the last three years to ensure we meet the BRIM requirement to report findings annually. In this report we included data collected on bird and mammal transects, camera trapping surveys, bat acoustic monitoring, wildlife observations, land snails surveys, weather and fire. The most significant finding in the 2013 report was the first group of Howler Monkeys in GSCP since the great forest destruction by Hurricane Iris in 2001, and it proves the importance of Ya'axché's work to conserve this important biological corridor. The 2013 Biodiversity Synthesis report can be found on Ya'axché's website in the 'Resource' section. Data for 2014 will be reported in the first half of 2015.

In 2014, we have continued last year's efforts in indicator bird and mammal species monitoring transects, doing an average of four evening and morning transects a month. During most of the year, we have continued last year's efforts in collecting bat monitoring data using a passive bat acoustic detector, although these efforts stalled due to an equipment failure. However, as explained in the indicator species section below, Ya'axché will soon expand their bat monitoring efforts.

In addition, we have established a new snail plot in the GSCP and most data collected there has been analyzed. Unfortunately, three of the bags collected in this new plot

were lost during a field station clean up. To avoid this in the future, a new, more secure storing system will be developed in the new laboratory we are building at our field station. Species information from the two one-hectare vegetation plots established in Bladen was completed in 2014. Additionally, we have continued our collaboration with Panthera Belize and have repeated last years camera trapping efforts to estimate the minimum jaguar population in the Maya Golden Landscape.

The automated weather station in Esmeralda (Bladen Nature Reserve) that was damaged last year by a flash flood and sent to the USA to be repaired was set up in early 2014. Unfortunately it was found later in the year, again damaged by a flood. We are currently looking for means to repair it again and set it up in a flood free location. Finally, this year we have completed road traffic monitoring during three weeks in November and have been gathering animal road crossing sightings throughout the whole year.

As Biodiversity monitoring activities continue growing, we have kept a systematic training schedule with both rangers and interns. Additional target bird and mammal species and reptile species training materials were created for the rangers, and further computer and equipment use training sessions were completed. By the end of the first half of 2014 we had employed two young Belizean interns and trained them in research and monitoring methods, data management, analysis and computer software use.

Ya'axché's Research Branch continues working to improve and increase biodiversity monitoring activities and environmental research using internal and local researchers. Local capacity building has been the main focus in 2014 and will continue being so in the coming years.

### **Indicator species**

At Ya'axché we realize the importance of bats; they are considered 'keystone species' that are essential to tropical ecosystems because they play ecological roles that are vital to the health of natural ecosystems and human economies. For that reason, bats are among the most important taxa that need to be systematically monitored. During this year, Ya'axché's Research Coordinator has been working on increasing bat monitoring activities not only within Ya'axché's protected areas, but also in other protected areas in Belize.

Firstly, we are working together with the Environmental Research Institute to develop a national strategy to monitor bats at a national level and set equipment requirements to do so. Secondly, we are trying to create a group of Belizeans to set up a Bat Conservation Programme (BCP) to join the Latin American Network for Bat Conservation (RELCOM) and make links to build local capacity and make joint strategies to conserve these important mammals.

Finally, we have been working on designing a systematic bat trapping schedule for next year – trapping activities will not only help us to assess the different bat species found in the Maya Golden Landscape, but it is also an opportunity to train other Belizean professional biologists and students and create a much needed national bat conservation network.



Bat falcons (*Falco ruficularis*) mating.

Photo: Kevin Wells.

## Freshwater monitoring

Monitoring the condition of streams is critical to their protection, providing evidence of the success or failure of management interventions and early detection of degradation before it has knock on societal impacts. Because macro invertebrates are taxonomically and structurally diverse and exhibit wide and often predictable variation in habitat requirements, feeding strategies, tolerance to pollution and sensitivity to fluctuations in environmental conditions, they have become one of the most widely used indicator groups for measuring stressor effects.

Furthermore, because of the relative ease and low cost with which macro invertebrates can be sampled, they offer a realistic method for use in the developing tropics. Recognizing this, in 2014 Ya'axché teamed up with long-time collaborator Dr. Rachael Carrie to develop a set of tools to monitor stream condition, these comprised of:

- 1) the identification of suitable bio-assessment metrics,
- 2) production of draft bio-assessment focused taxonomic key for use by community members, NGO staff and undergraduate students, and;
- 3) the acquisition of equipment for a laboratory facility to host academic, community and NGO training.

These tools will enable Ya'axché to continue building the capacity of Belize's current and future freshwater managers. They will be critical to standardisation and quality control in an anticipated national

bio-assessment programme, and for the training programmes Ya'axché will deliver to the University of Belize, fellow conservation organisations, community members and visiting student groups.

These tools enable stream condition to be assessed, our ability to recognise predicted declines in water quality and undertake informed management of the activities that threaten the freshwater and marine ecosystems upon which Belizean livelihoods depend.

## Staff

The list below represents staff (past and present) that have contributed to Ya'axché's achievements throughout 2014. As of January 2015, Ya'axché employs 29 full time staff. Volunteers, indicated by an asterisk, fill key positions in the organization.

Christina Garcia	Executive Director
Ivanny Oliva	Finance Director
Saleem Chan	Operations Director
Kenny Cal	Community Outreach & Livelihoods Director
Lee McLoughlin	Protected Areas Director
Kamille Pennell	Development Director
Bartholo Teul	Community Liaison Officer
Julio Chub	Education & Outreach Coordinator
Jaume Rusalleda	GIS Officer
Maximiliano Caal	Marketing & Communications Officer
Dianne Gomez	Administrative Assistant
Pedro Choc	Education & Outreach Program Support Assistant
Miguel Coc	Nursery Technician
Isidoro Sho	Agroforestry Extension Officer
Amy Feinstein*	Education & Outreach Officer
Maarten Hofman*	Research Coordinator
Olatz Gartzia*	Science Director
Said Gutierrez	Assistant Research Coordinator
Allan Romero	Biodiversity Research & Monitoring Intern
Melisa Sho	Biodiversity Research & Monitoring Intern
Gail Stott*	Botanist
Jenny Wain*	Development Officer
Fabienne Lefevre*	Development Officer
Vian Rajabzadeh*	Development Officer
Laura Grassi*	Agricultural Extension Volunteer
Marchilio Ack	Head Ranger
Victor Bonilla	Ranger, specialized in birds
Octavio Cal	Ranger, specialized in freshwater monitoring
Anignazio Makin	Ranger, specialized in freshwater monitoring
Mateo Rash	Ranger and licensed tour guide
Rosendo Coy	Monitoring Assistant Ranger
Vigilio Cal	Ranger, specialized in navigation
Marcus Tut	Ranger, specialized in snail monitoring
Marcus Cholom	Ranger, specialized in snail monitoring
Andres Chen	Ranger

## 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 2014:

- United States Fish & Wildlife Service: Wildlife Without Borders
- New England Biolabs Foundation
- Nicolas Hulot Foundation
- Protected Areas Conservation Trust
- Flagship Species Fund
- Gesellschaft für Internationale Zusammenarbeit – Caribbean Aquatic Terrestrial Solutions
- Red Sicta
- Grass Valley Trust
- Acacia Conservation Fund
- Global Trees Campaign
- United Nations Development Program
- Inter American Foundation
- National Protected Areas Secretariat
- Caribbean Community Climate Change Center
- United Kingdom (UK)-Department for International Development (DFID)
- GEF Small Grants Program
- Fondation Franklinia
- Belize Nature Conservation Foundation
- Big Lottery Fund
- Disney Worldwide 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
- Sarstoon Temash Institute for Indigenous Management
- Toledo Cacao Growers Association
- Toledo Development Corporation
- Toledo Agricultural Development Alliance
- Toledo Institute for Development and Environment
- Inter American Institute for Cooperation on Agriculture
- Sustainable Harvest International
- ArtCorps
- Panthera

## Members

Ya'axché would like to thank all its members who support our work through their kind monetary contribution!

# Financial statement

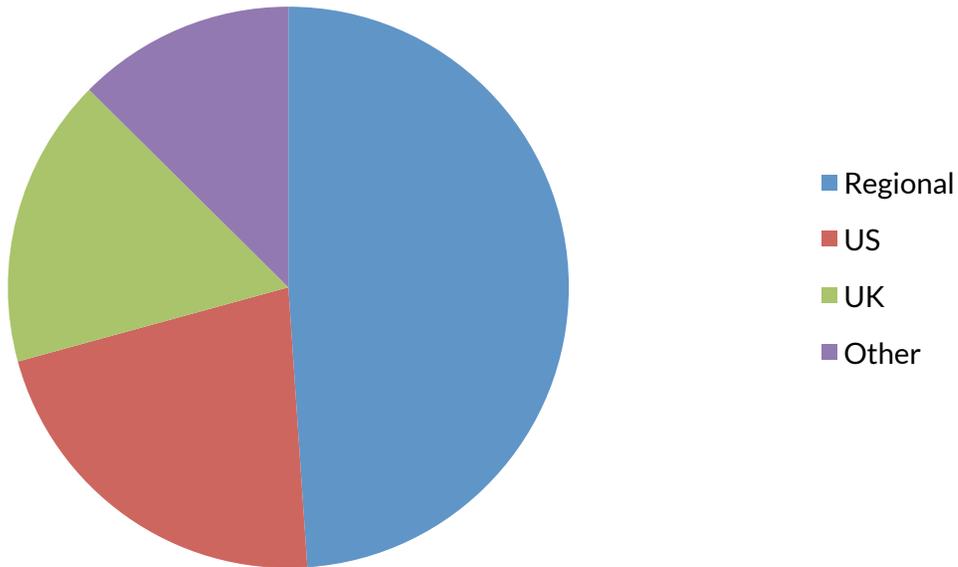
1st January to 31st December, 2014

## REVENUE

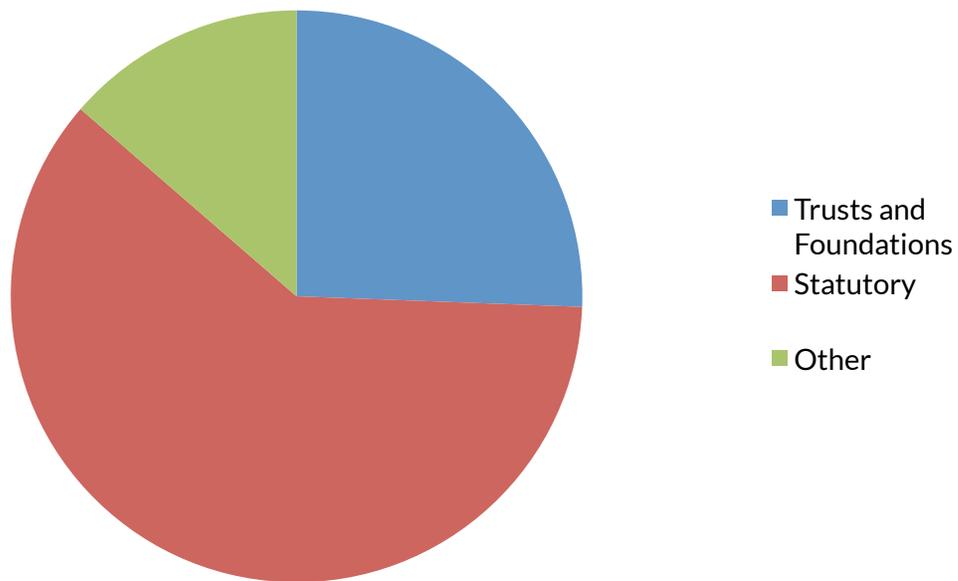
### Grant Revenue

Admin/Operational Reserve	250,283.47
NEBF-BIOLABS2012	3,953.00
CLP 2011	3,705.19
Scholarship Funds	400.00
Franklina (GTC) 2013	2,367.00
Nicolas Hulot Foundation	19,869.45
PACT Medium Sized Grant 2013	46,464.92
Flagship Species 2013	3,307.70
NEBF Biolabs 2013	3,556.50
GIZ GRANT 2013	31,358.92
RED SICTA	4,533.52
GRASS VALLEY TRUST 2014	19,773.35
CBA Planning Grant	3,690.00
ACACIA 2013	70,685.83
Global Trees Campaign 2014	137,379.11
IUCN-PACT	8,692.00
Student Groups/RFAD	2,707.99
SNC/NPAS	29,865.00
PACT Large Grant	104,585.00
UNDP Nursery	33,098.00
Inter American Foundation	75,927.66
USFWS HJL	41,708.62
USFWS Landscape	42,387.55
Caribbean Comm. Climate Change Centre	200,000.00
Millennium Seed Bank	10,845.76
NEBF 2015	16,839.25
CBA-Medina Bank	37,202.40
<b>Total GRANT REVENUE</b>	<b>1,205,187.19</b>
<hr/>	
<b>EXPENSE</b>	
Salaries	469,554.59
Core Activities Expenses	162,630.89
Program Expenses	261,220.78
Capital Expenses	53,640.04
<b>TOTAL EXPENSE</b>	<b>947,046.30</b>
Revenue less Disbursements	258,140.89

Geographical origin of funding 2014



Funding source 2014





**Ya'axché Conservation Trust**

22 Alejandro Vernon Street, P.O. 177  
Punta Gorda, Toledo District  
Belize

**Phone:** (+501) 722-0108

**Fax:** (+501) 722-0108

**E-mail:** [info@yaaxche.org](mailto:info@yaaxche.org)

**Web:** [yaaxche.org](http://yaaxche.org)

