



# Annual Report 2015

Ya'axché Conservation Trust



Punta Gorda | July 2016

**Cover page**

Geoffroy's Spider Monkey (*Ateles geoffroyi*)

Photo: Maximiliano Caal

**Back page**

Old growth forest of Bladen Nature Reserve

Photo: Tony Rath

**Maps**

All maps prepared by Jaume Rusalleda.



# Annual Report 2015

## Ya'axché Conservation Trust

Punta Gorda, Belize - July 2016

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Slaty-tailed Trogon (*Trogon massena*)  
photographed in Bladen Nature Reserve.

Photo: Erik Hammar.





Maturing cacao pods.

Photo: Maximiliano Caal.



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Blue Morpho (*Morpho peleides*).

Photo: Maximiliano Caal

## List of acronyms

BNR	Bladen Nature Reserve
CFR	Chiquibul Forest Reserve
CRFR	Columbia River Forest Reserve
COL	Community Outreach & Livelihoods
DRFR	Deep River Forest Reserve
ETB	EcoTourism Belize
GIS	Geographic Information Systems
GPS	Global Positioning System
GOB	Government of Belize
GSCP	Golden Stream Corridor Preserve
KBA	Key Biodiversity Area
LULC	Land Use/Land Cover Change
MGL	Maya Golden Landscape
MMNFR	Maya Mountain North Forest Reserve
NGO	Non-Governmental Organization
NPAS	National Protected Areas System
PACT	Protected Areas Conservation Trust
PAM	Protected Areas Management
SMART	Spatial Monitoring and Reporting Tool
TFCGA	Trio Farmers Cacao Growers Association
TIDE	Toledo Institute for Development and Environment
UNDP-GEF	United Nations Development Program - Global Environment Facility
WCS	Wildlife Conservation Society
Ya'axché	Ya'axché Conservation Trust
YICE	Ya'axché Institute for Conservation Education

## From the Executive Director

Dear friends of Ya'axché,

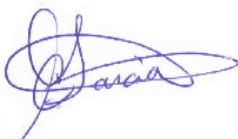
It is extremely satisfying to share with you our accomplishments for the year 2015. Not only did our work intensify over the past year, but it also became more interesting. Some organizational re-structuring took place, coupled with the expansion of our work to include another protected area as well as many new community members. The organization as a whole rose to the challenge with impressive results.

Some of our biggest achievements included: undertaking the co-management of Maya Mountain North Forest Reserve (MMNFR) and developing a monitoring and enforcement work plan for the reserve; fully implementing an agroforestry concession within MMNFR; piloting the Ya'axché Institute for Conservation Education (YICE) as a sustainable financing mechanism of Ya'axché; launching the Spatial Monitoring and Reporting Tool (SMART) and implementing it in Bladen Nature Reserve and Golden Stream Corridor Preserve; playing an integral part in the revision and passing of the National Protected Areas System and Protected Areas Conservation Trust bills; integrating a new farming technique called inga alley cropping into our extension work; and successfully completing a 2014-2015 organizational audit.

In order to respond to the rapid changes that occurred over the past year and produce the outstanding results that were accomplished, much adaptive management and growth took place within the organization. We deepened our relationship with established partners and forged bonds with new donors, leading to diverse funding opportunities; adapted our organogram to create better clarity regarding organizational structure; hired new staff with an array of valuable skills and provided capacity building opportunities in order to maximize staff potential; and developed an Education Strategy to guide our engagement with farmers, students, and communities in the Maya Golden Landscape.

As we make every effort to instil harmony between nature and human development for the benefit of both, Ya'axché will continue to improve and expand our programs. With the tireless efforts of our staff and volunteers and, of course, the support of our donors, we will promote a healthy environment and foster sustainable livelihoods within the MGL. Lastly, I would like to take this opportunity to recognize the hard work of the staff, board of directors, and volunteers and the generosity of our donors; without their effort and dedication, none of these achievements would have been possible. I will now leave you to enjoy our 2015 accomplishments via the annual report.

Sincerely,



**Christina Garcia,**  
Executive Director





Keyhole Cave, Bladen Nature Reserve

*Photo: Erik Hammar.*



## 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.

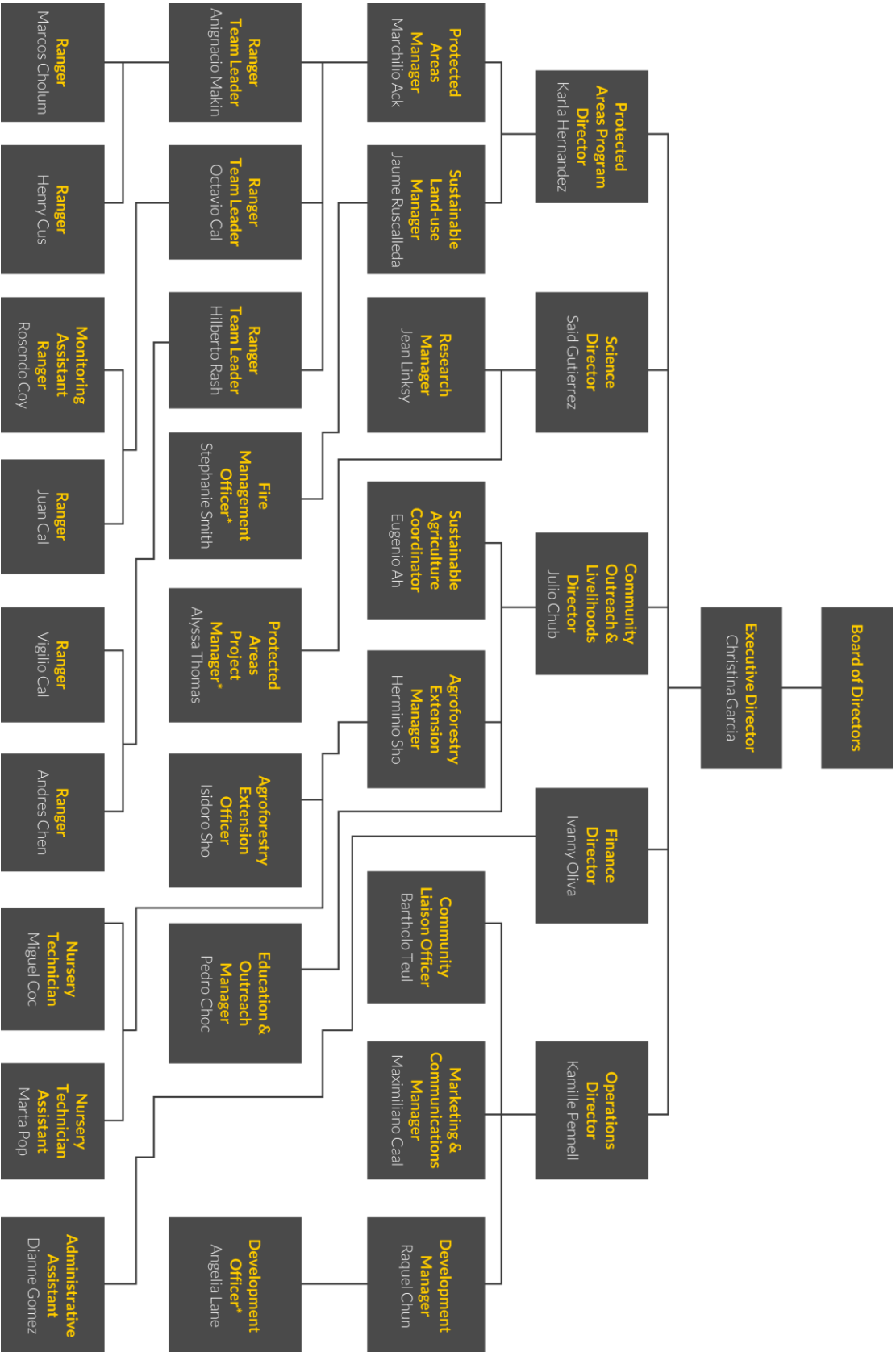
### Organizational values

Ya'axché works with...

- Integrity
- Respect
- Professionalism



# Institutional structure



## An Integrated Management Approach

Ya'axché was originally founded by members of local communities in order to protect the last forested corridor from the mountains to the sea, through the heart of the Maya Golden Landscape. These forward thinkers recognized the important role a healthy environment plays in the lives of the local people and took action to protect it. This focus on the relationship between communities and nature is still at the heart of Ya'axché's mission.

One part of our work is centred on improving the sustainability of livelihoods for community members through a variety of agricultural techniques that result in increased soil fertility and higher crop yields. Not only does this approach increase the financial stability of farmers, but it also leads to decreased deforestation and increased food security, which are especially important given the impacts of the changing climate. The vision is a resilient landscape with agricultural lands nested within connected standing forests that support the persistence of biodiversity and can continue to provide clean water, flood regulation, game species habitat, building materials, medicine and many other services that benefit the communities.

Our work with communities extends to the way we manage protected areas. In contrast to conservation approaches that exclude communities from protected areas, Ya'axché recognizes the benefit of involving the people who use forest resources in the management of the land. Through systems such as the recently created agroforestry concession in Maya Mountain North Forest Reserve, we are able to protect the integrity of the forest and its biodiversity while community members benefit from the resources within the protected area.

Moving forward towards our vision, Ya'axché continues to seek ways to include communities in conservation and improve the livelihoods and well-being of those who dwell within the Maya Golden Landscape, so that there can be "harmony between nature and human development for the benefit of both."





# THE MAYA GOLDEN LANDSCAPE



GUATEMALA

BELIZE

MAYA MOUNTAINS

BLADEN NATURE RESERVE

COLUMBIA RIVER FOREST RESERVE

COCKSCOMB BASIN WILDLIFE SANCTUARY

MAYA MOUNTAIN NORTH FOREST RESERVE

GSCP

DEEP RIVER FOREST RESERVE

SWASEY-BLADEN FOREST RESERVE

PAYNE'S CREEK NATIONAL PARK

PORT HONDURAS MARINE RESERVE

San Benito Poite  
San Lucas  
Mabilha  
Santa Teresa  
Jordan  
Blue Creek  
Aguacate  
Pueblo Viejo  
Jalacte  
San Vicente  
Santa Elena  
San Jose  
Nah Lum Can  
San Miguel Silver Creek  
Crique Jute  
San Pedro  
Columbia  
Big Falls  
San Marcos  
Pinchill  
Yemerl Grove  
Laguna  
San Felipe  
Eldridgeville  
Forest Home  
Cattle Landing  
Punta Gorda Town  
Boom Creek



- Villages
- Highway
- Rivers
- MGL
- Protected Areas



South Stann Creek  
Santa Cruz  
Sagittun  
Riversda

San Pabio  
Redbank  
Maya Mopan  
San Roman

Trio

Bladen

Medina Bank

Tambran

Golden Stream

Indian Creek

Hicattee

San Marcos

Yemerl Grove

Forest Home

Cattle Landing

San Pabio

Redbank

Maya Mopan

San Roman

Trio

Bladen

Medina Bank

Tambran

Golden Stream

Indian Creek

Hicattee

San Marcos

Forest Home

Cattle Landing



# Maya Mountain North Forest Reserve

## A new co-management agreement

Ya'axché and the Belize Forest Department signed a co-management agreement for Maya Mountain North Forest Reserve (MMNFR) on 14 October 2015. This is the first such legal agreement for a Forest Reserve in Belize, and is a testament to Ya'axché's success and the Belize Forest Department's commitment to collaboration for achieving effective and sustainable management of Belize's protected areas system.

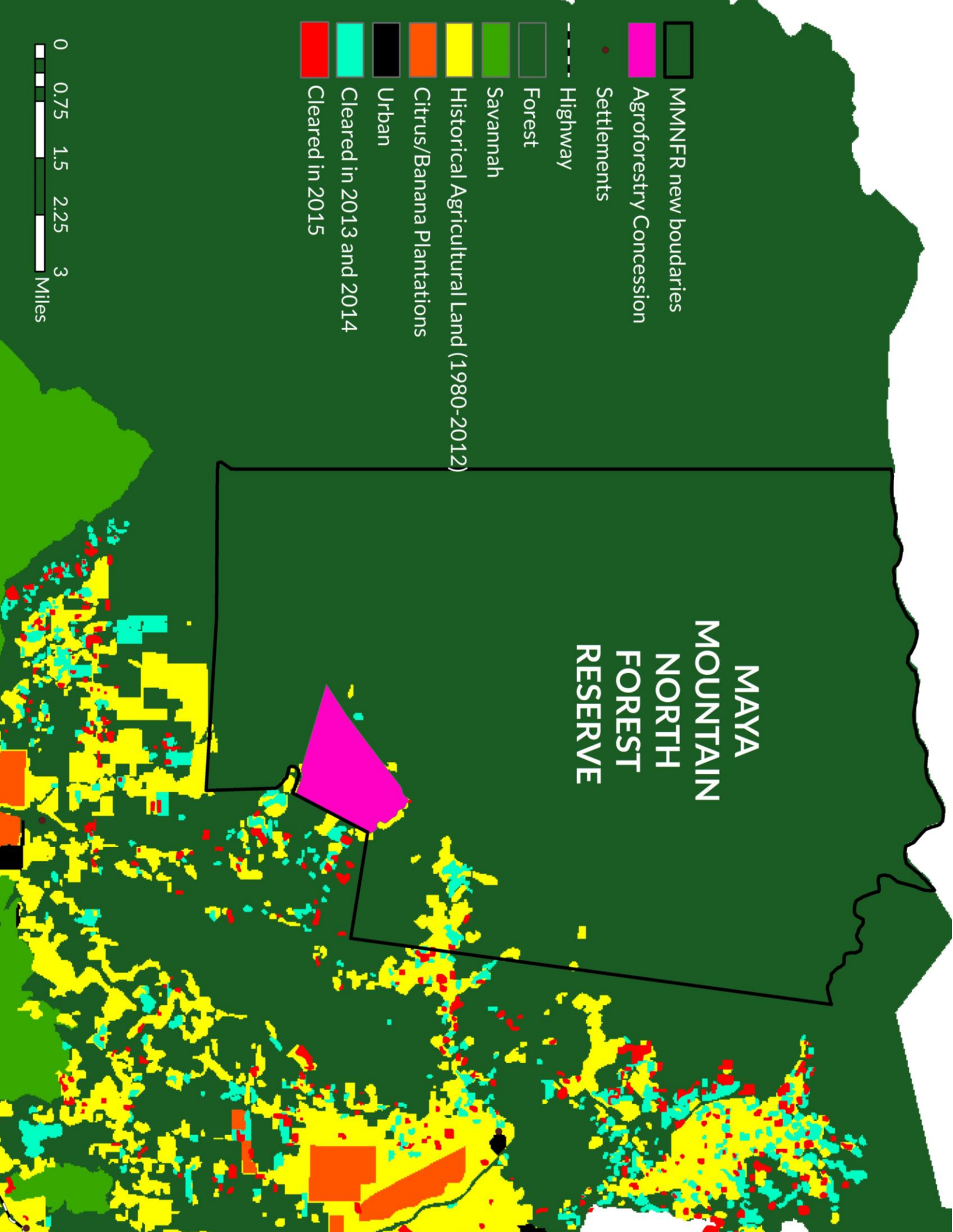
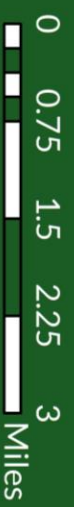
MMNFR forms a key component of the Maya Mountains forest block, contributing to national and regional forest connectivity that is critical in preserving Belize's biodiversity and building resilience to the impacts of climate change. In a national Protected Area Prioritization exercise conducted in 2012, MMNFR ranked 12<sup>th</sup> out of 56 evaluated protected areas, it is recognised as a Key Biodiversity Area (KBA) and has been prioritised for protection and improved management as part of a World Bank Global Environmental Facility project aimed at strengthening management of KBAs in Belize. for protection and improved management.

Over the past decade, MMNFR has been subject to intensive rates of deforestation and is one of the most threatened forest reserves in southern Belize. Between 2004 and 2016, approximately 1,440 acres of forest within the reserve were illegally cleared for agriculture. The integrity of the reserve's forests has been further compromised by the de-reservation of 5,248 acres of the original reserve area over the same period, which is likely to result in the complete conversion of this land to non-forest. Ya'axché's involvement in the management of the 36,000 acres that remain in the reserve will lead to improved monitoring and more effective enforcement activities and piloting of innovative models for the sustainable management of forest reserves to deliver multiple benefits for biodiversity and communities within this area of critical ecological importance.



# MAYA MOUNTAIN NORTH FOREST RESERVE

- MMNFR new boundaries
- Agroforestry Concession
- Settlements
- Highway
- Forest
- Savannah
- Historical Agricultural Land (1980-2012)
- Citrus/Banana Plantations
- Urban
- Cleared in 2013 and 2014
- Cleared in 2015



## Community agroforestry concession

Since securing the first agroforestry concession in Belize within Maya Mountain North Forest Reserve (MMNFR) in June 2014, Ya'axché has been working with the Trio Farmers Cacao Growers Association (TFCGA) to implement the management plan established for the concession. By providing farmers with a space to conduct sustainable agricultural activities within the reserve, this pioneering initiative aims to bring sustainable economic development to the Trio community while protecting the integrity of the forest and the ecosystem services it supplies.

Over the past year, much progress has been made in the concession through the collaboration of Ya'axché and TFCGA. The concession boundary was demarcated in order to make it clear where the concession ends and the forest reserve begins. Existing access roads were improved so that the farmers could reach their plots within the cacao-based agroforestry section. A 1-acre nursery was established to facilitate the germination of cacao seeds, and 22,231 cacao seedlings were planted.

In order to create space for the cacao trees and allow some light to penetrate the canopy, bush was cleared and trees were selectively felled on 70 acres. As a way of providing income in the interim until cacao can be harvested, 2,640 plantain trees were planted in the annual crops section. And the process came full circle as the farmers sowed 28,000 cacao seeds to be planted next year.

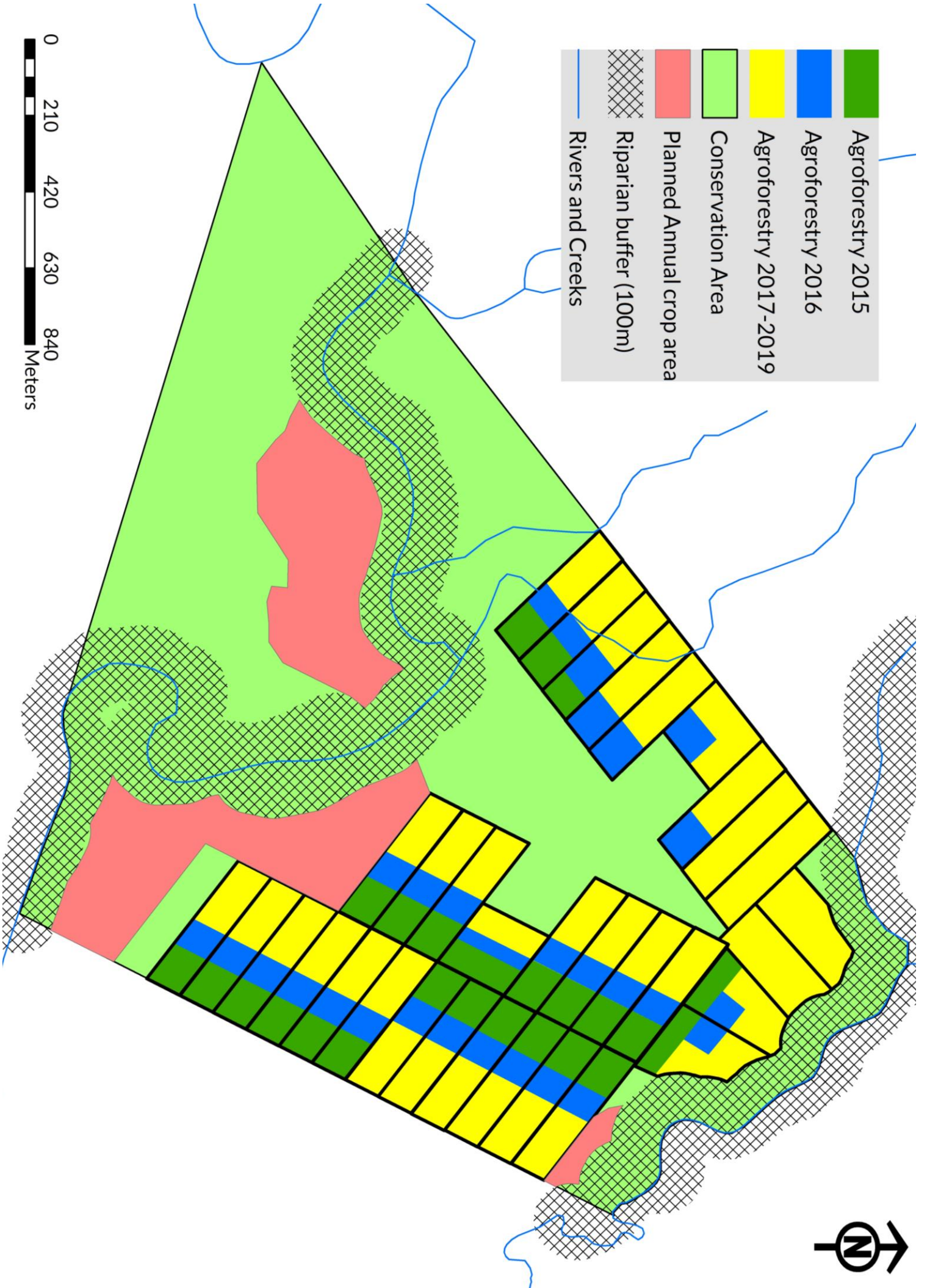
Not only did TFCGA members receive equipment, materials, and support from Ya'axché, but they have also had the opportunity to participate in trainings on topics such as leadership, governance, team

building, sustainable land use, soil and shade management, grafting, pruning, GIS and GPS, and beekeeping. In addition, funding has been secured for the TFCGA to undertake vegetable gardening within covered structures in the concession as a means to generate income in the short term.

The co-management of MMNFR provides Ya'axché with the unique opportunity for innovation in protected area management in Belize. The design of the community agroforestry concession involved careful participatory planning that included community members, the Belize Forest Department and Ya'axché. The concession plan includes dedicated conservation areas that are managed and protected by community members and Ya'axché; careful selection of agroforestry practices that minimize impacts on biodiversity; vigilant management of clearance activities and liaison with the Belize Forest Department; and community-led monitoring and management of external threats. Through these calculated measures, impacts to forest biodiversity have been avoided and mitigated.

Potential risks and impacts from concession activities for biodiversity in MMNFR have been assessed and are being mitigated and managed through development of a management plan for the concession, biodiversity monitoring, increased presence and patrols by Ya'axché staff alongside community monitoring and reporting.







## Sustainable Financing Venture

Since 2005, Ya'axché has been investigating the potential for developing sustainable financing for Ya'axché's conservation and development work. Ten years later, the Ya'axché Institute for Conservation Education (YICE) was born. YICE consists of several branches, including EcoTourism Belize, which provides ecotours, group conservation education experiences, and rustic accommodations; Ya'axché's technical expertise are being made available to support projects elsewhere in Belize; a nursery that sells organic fruit and timber seedlings; and a membership program that includes friends and supporters of Ya'axché. One hundred percent of profits generated from these ventures are reinvested into community development and protection of wildlife and wild places in southern Belize.

### EcoTourism Belize

EcoTourism Belize is helping to preserve wild places in southern Belize by showcasing the ecosystems we are striving to protect and the work that our staff carry out each day. EcoTourism Belize offers day tours, group tours, and student group packages, as well as rustic accommodation in our bunkhouse.

A business plan and marketing strategy was created and has guided recent developments toward the realization of this venture. A portion of the Golden Stream Corridor Preserve (GSCP) was set aside to be used for tours; the ranger guides are being professionally trained by reputable tour guides; the field station facilities were upgraded to accommodate guests; and a website was set up to facilitate booking of accommodations and ecotours ([www.ecotourismbelize.com](http://www.ecotourismbelize.com)). With these improvements complete, we are ready for the upcoming tourist season.



Yucatan Black Howler Monkey (*Alouatta pigra*) have returned to Golden Stream Corridor Preserve, 15 years after Hurricane Iris in 2001.

Photo: Eric Sambol.



## Land-use change

### Land Use/Land Cover Change in the MGL

Changes in land use and land cover are indicators of how communities interact with their environment. Ya'axché uses GIS and satellite imagery to monitor land use/land cover (LULC) changes in the MGL in order to identify trends and areas in which to focus our efforts. In the MGL, agricultural activities are the main drivers of LULC change.

The most prevalent agricultural method used by farmers in southern Belize is that of shifting agriculture, employing the slash-and-burn technique. Farmers cut down the vegetation in an area, allow it to dry, and burn it, clearing the way for crops, which mainly consist of corn and beans, but also include rice, pumpkin, squash, cassava, and plantain, among others. In the past, a plot was used for 2 to 4 years, and when the nutrients were depleted and crop yields decreased, farmers repeated the process in a new area, leaving the used plot for 10 – 20 years to allow for soil to regain fertility before it was utilized again.

Traditionally, only one slash-and-burn planting cycle took place each year in the dry season (slash in March/April, burn in April/May, and plant in June/July at the start of the rainy season). However, in recent decades, due to a decrease in crop yields and an increase in population, farmers have added a second planting cycle that normally takes place during October and November. During this cycle, it is too wet to burn, so farmers use the slash-and-mulch method, in which vegetation is cleared in nutrient-rich areas with generally young re-growth and the cuttings are left to decompose and create mulch for the crop.

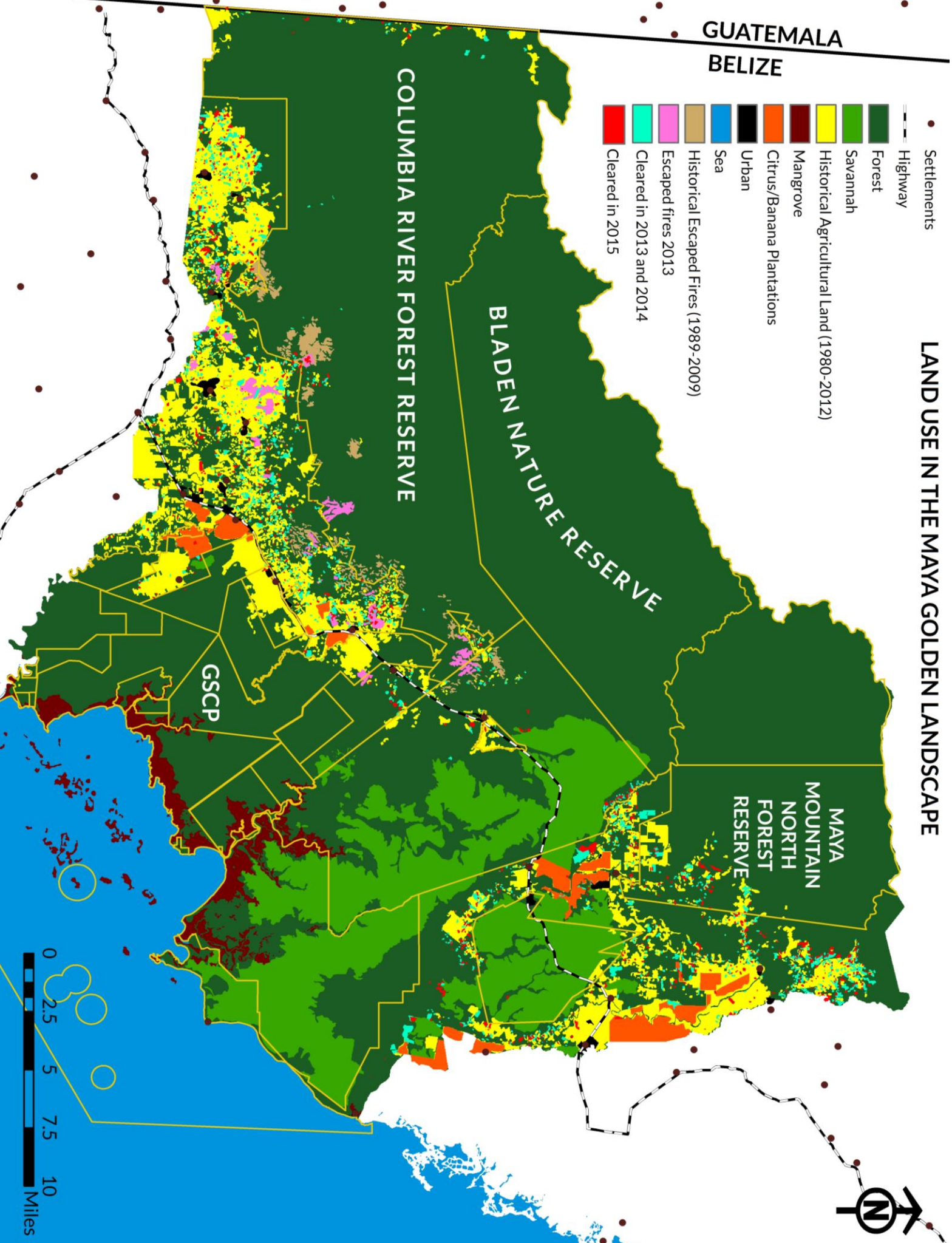
Similarly, crop yield decrease, population increase, and an increase in agricultural exports have influenced where land use change is occurring. We have observed that fallow periods have been reduced to 5 to 7 years, and farmers are also expanding the agricultural frontier into forests that have not been used for agriculture in recent history. The completion of the new highway to Guatemala via Jalacte could influence these trends in the coming years. Many recent immigrants to Belize have close ties with Guatemalan markets, and the new road will increase connectivity of the Toledo district to those markets. This could result in an increase in intensive agricultural approaches, as opposed to subsistence agriculture, as farmers take advantage of access to these markets and increased income. If the intensification in production is done unsustainably, this could increase the rate of deforestation in Toledo. More importantly, Ya'axché has an opportunity to work with local authorities and farmers of southern Belize to support the sustainable development of the agricultural sector.

Wildfires also have an effect on LULC change. From 1998 to 2015, escaped agricultural fires burned 45,428 acres of forest, in addition to losses of crops and homes. Wildfires are a serious threat to the protected areas managed by Ya'axché due to their proximity to agricultural areas and the lack of resources in Belize for suppressing fires. In addition, escaped fires threaten communities, their livelihoods and wellbeing. In our experience, many farmers are not aware of the necessary precautions to avoid escaped fires.

# 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 and 2014
- Cleared in 2015





In order to address the issue of fire control, Ya'axché has provided fire management training to communities through a partnership with Toledo Institute for Development and Environment (TIDE), assisted farmers with controlled agricultural burns, responded to escaped fires within our protected areas, and raised awareness at public events, and we will continue to work with community members to encourage better practices when it comes to burning for agriculture.

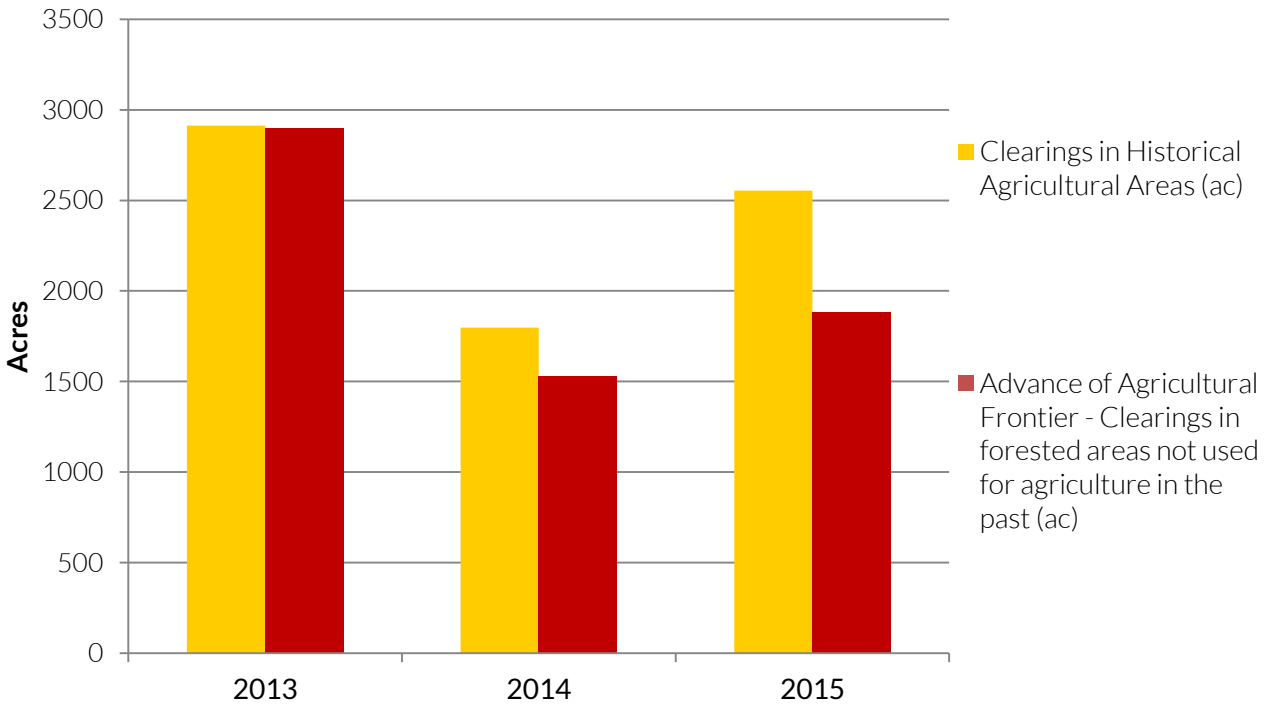
Although Ya'axché focuses its work within Maya communities, we also acknowledge the contribution other stakeholders make to LULC change in the MGL. The banana and citrus plantations that have been established in Toledo (with a total of 9,223 acres of forest cleared since 1980) and the Mennonite communities of Pine Hill and Roseville (which have cleared 1,821 acres of forest since 1994) have contributed extensively to deforestation. In the recent past we have approached the banana industry to push for certified production, and we plan to continue applying pressure on government to regulate this industry. With regard to Pine Hill and Roseville, it may prove beneficial to work with these traditionally insulated Mennonite communities in order to encourage the adoption of more sustainable practices.

The current trends in LULC change make it more important than ever to push for sustainable agricultural development in Toledo (and nation-wide). If Toledo is to be able to support an increasing population and meet market demands, increasing food production in a sustainable way is of critical importance. Belize's forests maintain biodiversity and provide the essential ecosystem services that agricultural production depends on.

Sustainability will require breaking the shifting agriculture cycle and stabilizing food production in certain areas by employing techniques, such as inga alley cropping and agroforestry that will maintain soil fertility and crop yields. It is also important to face the threats to forests posed by industries that have already taken over huge swaths of land in other Central American countries, including cattle ranching and plantations of banana and African oil palm. This will require community involvement in decision making and government support in favour of sustainable agricultural practices, which we hope to see reflected in the newly drafted Food and Agriculture Policy for Belize (2015-2030).

Communities in the Maya Golden Landscape rely on their environment for farmland and for the ecosystem services provided by forested areas. More sustainable land use planning and management will enable future generations to continue to live off the land and natural resources of the MGL and progress community development whilst conserving the ecosystem services upon which communities depend and the biodiversity that makes this one of the most important forest corridors in Mesoamerica. Through our COL and PAM programs, Ya'axché is pushing both communities and government agencies towards this road to a sustainable future for all.

**Figure 1.** Land clearance in historical agricultural areas and forested areas in the MGL between 2013 and 2015.



**Table 1.** Land clearance in the MGL between 2013 and 2015 by landscape type.

	2013	2014	2015
Clearings in Historical Agricultural Areas (ac)	2912.95	1796.47	2554.56
Advance of Agricultural Frontier (ac) (Clearings in forested areas not used for agriculture in the past)	2897.27	1528.97	1879.59
Clearings in Historical Escaped fires (ac)	32.71	69.00	125.48
Clearings in Riparian Area (66ft)	186.81	130.14	184.12
Clearings in Protected Areas (ac)	638.43	255.04	612.38
Clearings In Matrix (%)	49.85	52.92	57.61
Clearings Out of Matrix (%)	50.15	47.08	42.39
Proportion of clearings in PA's (%)	10.93	7.51	13.81



## Community Outreach & Livelihoods

Since 1998 the Community Outreach and Livelihoods (COL) Program has been engaging communities to promote practices that improve livelihoods and protect the natural resources on which communities depend. The COL program works closely with communities through extension work and trainings with farmers and engages community members and community-based organizations through capacity-building workshops and outreach strategies in order to increase their skills and knowledge with regard to environmental issues, sustainable agricultural practices, financial management, and organizational themes. As communities become more informed, gain more skills, and transition to more sustainable practices, they begin to interact with their surroundings in ways that allow them to have more financial stability and provide longevity for their way of life.

### Agroforestry

Agroforestry encompasses a variety of practices that integrate agricultural and forest elements. The benefits of agroforestry are numerous and include improved crop diversity, increased diversity of income sources for the farmer, and maintenance of the forest ecosystem and the services it provides. Looking to the future, agroforestry is an appropriate strategy in certain geographies and ecosystems for addressing issues such as food security, land degradation, poverty, and climate change. In order to combat these issues in southern Belize, Ya'axché promotes sustainable agricultural methods such as cacao-based agroforestry, inga alley cropping, and beekeeping.

Cacao-based agroforestry was one of the first sustainable agriculture practices that Ya'axché began promoting, and has remained popular with our farmers. This type of agroforestry involves integrating a variety of trees, such as fruit, cacao, and timber, that can be harvested at differing intervals, resulting in short-term, medium-term, and long-term income. Ya'axché has provided start-up seedlings, training sessions, and extension visits for the support of this type of agroforestry for a decade, and that assistance continued over the past year. Farmers received training in plot design and management, quality bud selection, identification of high yielding trees, cacao grafting, and disease control. Additionally, equipment tools and 6,300 seedlings were given to 12 new and 15 existing farmers to establish and expand their cacao farms. Currently 75 farmers that we have supported are implementing cacao-based agroforestry in 7 MGL communities. Furthermore, four model farms have been established as a way to demonstrate this sustainable method to interested farmers.





Farmer planting young cacao trees within the agroforestry concession in MMNFR.

*Photo: Nicholas Dagorn*



## Alley cropping

We have recently begun promoting a technique called inga alley cropping as a way to restore degraded soils. This method involves planting nitrogen-fixing leguminous trees, such as *Inga edulis* and *Inga oerstediana*, in rows with annual crops, such as corn and beans, between the inga. Each time the inga trees are pruned, they release nutrients into the soil to replace what is being extracted by the crops. The leaves of the inga tree are left on the ground to provide mulch for the crops, and the branches are extracted for firewood. The inga trees' roots help to prevent erosion, and the same plot of land can be used for upwards of 20 years, meaning that new forest does not have to be cleared or burnt.

In order to promote this novel method, Ya'axché provided training and assistance in the establishment of 4 acres of inga alley cropping plots. Additionally, a group of ten farmers and Ya'axché staff participated in an exchange visit to the Inga Foundation in Honduras to observe an existing inga alley cropping system and learned how to cultivate their own. In order to better support farmers in implementing this new technique, a Ya'axché extension officer and an Agriculture Department extension officer received in-depth training from the Inga Foundation. Over the year, we have had numerous requests for assistance in establishing inga, which is a good sign for this new addition to our sustainable agriculture repertoire.

## Beekeeping

Beekeeping is an agroforestry method that benefits nature through natural pollination while also providing products that can be sold by farmers for income. The number of community members who adopted beekeeping as an alternative means of income generation increased this year to eighteen beekeepers, who were each provided with two beehives and equipped with tools including suits, smokers, knives, and frames. Workshops were also provided for the beekeepers, with topics including nourishment for bees, how to control swarming bees, pest management, equipment use, and hive division. Farmers were able to collect wax, pollen and 427 pounds of honey, which was sold locally by the pound. The current beekeepers have expressed an interest in increasing the number of hives, and with an expected increase in beekeepers in years to come, we anticipate a greater supply of honey in the MGL in the near future.

## Capacity building

One of Ya'axché's strengths is community empowerment. Provision of start-up materials and advice can go a long way toward establishing a project, but strengthening the capacities of community members and community-based organizations is a critical component in ensuring long-term success. This year, several of the community-based groups that we work with received capacity-building workshops in topics such as leadership, conflict management, board function, group dynamics, and good governance. Participants included the Trio Farmers Cacao Growers Association; the Protectors of the Last Corridor, a group that is implementing a project geared toward climate change adaptation in Medina Bank; four women's groups in Indian Creek that provide catering services and crafts; community leaders of seven communities; and Ya'axché staff.

By improving the skills possessed by community members and organizations, we aim to increase the longevity of our work and empower the communities to take up the torch.

## Education

Education remains an important pillar for the development of communities within the MGL. This year the COL team engaged children through education programs such as school visits, field trips, and a summer camp program. The COL team made presentations at nine schools on topics such as climate change and the importance of standing forests. Additionally, 100 students had the opportunity to visit the Bladen Nature Reserve for a hands-on educational experience.

Fifty-two children from seven communities attended this year's summer camp, the theme of which was "Children and Climate Change: Take Action." The students were educated about climate change and its impacts on the environment, as well as the importance of the reef ecosystem and how upstream actions affect the marine environment. To support these lessons, they visited the reef to see for themselves the effects of climate change.

Another development that will have major impacts on the education program is the creation of an education strategy that will guide the work of the education team for 2015 - 2017. This strategy was developed with assistance from staff members, volunteers, and teachers from the MGL communities. With this document as a guide, COL staff can effectively communicate the message of conservation to the next generation.



## Community Outreach

Not only is it important to educate children about sustainable agriculture and environmental issues, but it is also beneficial to engage with other groups within communities about these topics. Community outreach includes raising awareness on better agricultural and land use practices and more effective conservation actions but it also involves listening to the needs and challenges of communities and their constituents and working together to develop strategies to address these.

This year, the Race Against Fire was held in San Pedro Columbia on Saturday 4<sup>th</sup> April 2015. We educated attendees about proper fire control techniques and sustainable farming methods amidst the backdrop of a 60-kilometer beach cruiser bicycle race, the winners of which were Charles Nunez (1<sup>st</sup> Place), Pedro Xi (2<sup>nd</sup> Place), and Devin Velasquez (3<sup>rd</sup> Place). Additionally, we held the MGL Farmer of the Year event on the 30<sup>th</sup> of August in Indian Creek community. The event brought together farmers and their families to enjoy games and activities and recognize 3 farmers for their commitment to adopting sustainable farming methods. Martin Chiquin of Indian Creek was acknowledged as the MGL Farmer of the Year 2015 followed by 2<sup>nd</sup> place winner Pablo Makin, and 3<sup>rd</sup> place winner Santiago Coh.

We were also able to reach communities in the MGL and beyond through radio talk shows that covered topics such as fire awareness and sustainable agricultural practices. In addition, through our partnership with ArtCorp, an international NGO that uses creativity to promote leadership and community development, we supported 6 clinics that engaged the communities of Indian Creek, Medina Bank, and Trio. These clinics utilized different art forms, such as clay sculptures, mural painting, and theatre skits, to empower women and children and create awareness regarding climate change and pollution.



Martin Chiquin receiving his 2015 MGL Farmer of the Year Award.

Photo: Erin Hicks.



## Protected Areas Management

An important aspect of our work is managing and co-managing three protected areas: Golden Stream Corridor Preserve (GSCP), Bladen Nature Reserve (BNR), and the recently-added Maya Mountain North Forest Reserve (MMNFR). We employ ten rangers from local communities, and they patrol the protected areas for evidence of illegal activities, as well as conducting biodiversity monitoring transects. As is the case around the world, our rangers put their lives on the line every day for the important work of protecting these biodiversity-rich areas from illegal harvesting and extraction of resources and other threats facing them. Without the intact forest ecosystems that exist in these protected areas, many of the critical services, such as water purification and flood regulation provided to local communities and local businesses, would disappear. Therefore, the work of the Protected Areas Management (PAM) team is extremely important, both for nature and for the communities with whom we work.

### Restructured and revitalized

This year, a restructuring took place that included the dissolution of the Head Ranger position and the creation of the Protected Area Manager position. Marchilio Ack, who has been with Ya'axché since its beginnings in 1998, undertook this position in recognition of his excellent leadership, which involves a considerable amount of new responsibilities. The majority of Head Ranger tasks were allocated to three new Team Leader positions, one for each patrol team, who were selected after a 9-month period of try-outs and capacity building.

This new structure, initiated in June 2015, has proven to be a resounding success. The new Protected Areas Manager is responsible for strategic development, partnerships with regulatory agencies and community leaders, and reporting, in addition to his ongoing work as a Wildlife Conflict Officer working with Belize Forest Department and Panthera. The three new Team Leaders have responded exceptionally well to their new positions by increasing their self-determination and utilizing their experiences, which has resulted in them taking the initiative to decide where and when to patrol. This new structure is also particularly suited to the geographic spread of the ranger teams across hundreds of thousands of acres of protected areas as it allows for decision making power on site.



Harpy Eagle (*Harpia harpyja*) has been sighted within the agroforestry concession in Maya Mountain North Forest Reserve.

Photo: Erik Hammar.



## Spatial Monitoring and Reporting Tool

Along with the restructuring of the PAM team, a new tool was adopted for increasing the efficiency and effectiveness of patrols. The Spatial Monitoring and Reporting Tool (SMART) software, released in 2013, has revolutionized the way practitioners in conservation evaluate the effectiveness of protection-targeted initiatives as it was designed specifically to record ranger patrols and where illegal activities occur. SMART allows for mapping and conducting spatial analyses of infractions and patrol effort, which is useful for the purposes of allocating resources, increasing patrol efficiency, and increasing accountability. This tool also empowers and motivates rangers by keeping track of their achievements.

Ya'axché piloted SMART over a 6-month period, during which the default data model was adapted to the southern Belize context by disabling features that were not needed and creating new ones, as well as changing the language so that rangers, managers, and scientists alike could understand the terms (e.g. common names for species rather than scientific names). Ya'axché's successful pilot, which was guided by support from the Wildlife Conservation Society (WCS), sparked the interest of other organizations, and a series of workshops with the Belize Forest Department and several protected area co-managers were conducted by WCS. These workshops facilitated the development of a common data model and contributed to building national capacity on data collection and management.

These workshops and the successful pilots of SMART by Ya'axché and the Belize Fisheries Department inspired the Belize Forest Department to roll out SMART at a national scale for increased effectiveness in forest management.

The SMART technology has set the tone for gradually moving away from primarily routine patrols, focused on internal anecdotal knowledge of the patterns and character of illegal activity. Instead, patrols will now be recorded as long-term datasets in coherent, easy to use databases, which will not only allow patrol data to be stored in a logical manner, but will also facilitate analysis in order to target patrols based on patterns of illegal activity. This new approach will be essential as Ya'axché's Protected Areas Management team takes on one of Belize's most heavily impacted protected areas, MMNFR.





Rangers Anignacio and Marcos on a deep patrol inside Bladen Nature Reserve.

*Photo: Maximiliano Caal.*



## Ranger patrols

This year the PAM team matched the intensity of patrols from previous years, covering an area extending into all zones of Bladen Nature Reserve, the eastern area of Columbia River Forest Reserve, the northern part of Deep River Forest Reserve, the southern and eastern parts of Maya Mountain North Forest Reserve, and the Golden Stream Corridor Preserve. According to the SMART data, during the 7-month period from June to December, 247 patrols were conducted:

- 4 patrols for follow-up on incidents and/or intelligence
- 16 patrols to conduct reconnaissance with regard to a particular threat
- 15 patrols to assist research & monitoring activities
- 212 patrols to conduct general surveillance

In October 2015 Ya'axché was granted the co-management of MMNFR, a 36,000 acre forest reserve with an active hardwood logging concession and a variety of illegal activities taking place, including agriculture, cattle ranching, hunting, and logging. This agreement has brought additional responsibility and an important opportunity for the PAM team to strengthen biodiversity conservation within the protected area. Effort is currently being directed to secure the necessary resources to support effective management of the forest reserve.

This year the rangers entered areas of Bladen Nature Reserve that have never been visited by Ya'axché. These patrols ventured into some of the most remote places in Belize with the purpose of discovering whether the impacts of illegal activities such as *xaté* extraction and looting were ongoing.

Our team discovered that although there had clearly been *xatero* activity in the past, it was at least 6 months old. This corresponds with evidence from Chiquibul Forest Reserve, north of Bladen Nature Reserve, where *xatero* activities were also reported to have decreased. The reduction in activities is likely due to depletion of the resource (*xaté*), distance necessary to travel for collection, the presence of more lucrative resources (e.g. timber, gold) closer to the Guatemalan border, and increased law enforcement presence through newly constructed border conservation posts (Valentin, Caballo and Cebada). With the new structure of the PAM team and the adoption of the SMART software, we now have the capability to record and communicate illegal activity trends such as these in order to improve our enforcement.



# Monitoring & Research

## Biodiversity monitoring

Our transect monitoring effort was comparable with previous years. A total of 69 mammal and 137 bird transect visits were conducted in 2015, only a slight decline compared to 2014. Village lands recorded a higher species richness than in 2014, particularly for target bird species and was comparable to that of forested lands and savannah. However, village land species richness was influenced by the abundance/dominance of the disturbance indicator species Plain chachalaca. Game species indicators were completely absent from village land transect. The forest transect BNR2 (Bladen Nature Reserve), is considered the least disturbed of the transects, and exhibited high species richness for both bird and mammal target species with dominance by one or two forest indicators. Overall the forest transects in Bladen Nature Reserve and Columbia River Forest Reserve (CRFR) recorded higher target species richness than transects in the still recovering, hurricane damaged, Golden Stream Corridor Preserve (GSCP).

Tree monitoring was established in 2012 and by 2015 we had collected enough data to be able to report on the phenology study of a few threatened and rare tree species. This study provides valuable information about species that lack life-cycle data which can be instrumental in the development of sustainable harvest and management plans of species. As a result of the monitoring we are able to share information on seven species that we consider to be either valuable to general biodiversity or of socio-economic importance. Among these species we focus heavily on the life cycle of the rosewood species *Dalbergia stevensonii*,

which is a species that has been threatened by over-extraction in the past. In order to make management decisions on this species we require accurate and reliable data on the life-cycle of rosewood in Belize. So far our data shows that the species produces an abundance of flowers and seed but very few seeds end up being viable to produce seedlings. More data is required to fully understand the species and how it would be able to cope with a sustainable extraction regime.

One of our major efforts in 2015 was the development of a bat species inventory within the Maya Golden Landscape (MGL). This was conducted across three “disturbance” gradients; mature forest in Bladen Nature Reserve, hurricane Iris disturbed forest in Golden Stream Corridor Preserve, and small agroforestry farms and orange groves in the MGL. A total of 51 species of bats were recorded and three new families were documented. This represented a significant increase from the number of species and families recorded in previous years. GSCP yielded the lowest diversity for bats and unlike in other years, bat diversity was higher in BNR2. Bladen Nature Reserve proves to be prime habitat for many species of bats including some rare and uncommon species of bats of which we know very little about.

One of the most interesting finds was the wrinkled face bat *Centurio senex* which although has a wide global distribution it is a genuinely rare species. With its odd appearance of multiple skin folds on the face this bat is in the leaf-nosed bat family despite not actually having a leafed nose.



*Centurio senex* the wrinkled face bat also known as the “100-year old man” as the literal translation of its scientific name implies.

Photo: Tom Foxley/ Olatz Gartzia.



While there is little known about this species, we do know that it feeds on fruits and is considered a very important pollinator for crops. Another interesting species was the equally rare Sword-nosed bat *Lonchorhina aurita*. This species is a mature forest loving species and Bladen Nature Reserve is once again prime habitat for this species. In stark contrast to *Centurio senex*, it is easily identifiable by its incredibly long nose leaf from which it gets its common name. It is an impressive looking bat and is an aerial gleaner, feeding on insects. This species along with other insectivores are well known for eating vast quantities of insects per night even ranging in the tons. This is an important ecosystem service that bats provide to us for pest control and, indirectly, disease control such as dengue and malaria which are transmitted by mosquitos which are part of bat diet.

Ya'axché's biodiversity monitoring program has grown significantly in 2015 and has incorporated many important indicators of environmental health. The aim of the program for the foreseeable future is to grow its scope to encompass the monitoring of biodiversity within sustainable agroforestry systems. This is an effort to showcase the importance of sustainable agricultural practices both for livelihoods and for ecosystem and environmental health. With this growth, Ya'axché has been able to get an insight into the status of biodiversity in the ever changing landscape of the Toledo District in Belize.



*Lonchorhina aurita*, the Sword-nosed bat is an insectivore. It typically flies high and captures insects in the air.

Photo: Tom Foxley/Olatz Gartzia.



## Staff

The list below represents staff (past and present) that have contributed to Ya'axché's achievements throughout 2015. As of January 2016, Ya'axché employs 29 full time staff. Volunteers, indicated by an asterisk (\*), fill key positions in the organization.

Christina Garcia	Executive Director
Karla Hernandez	Protected Areas Program Director
Ivanny Oliva	Finance Director
Julio Chub	Community Outreach & Livelihoods Director
Kamille Pennell	Operations Director
Said Gutierrez	Science Director
Lee McLoughlin	Protected Areas Program Director
Kenny Cal	Community Outreach & Livelihoods Program Manager
Seleem Chan	Operations Manager
Jaume Ruscalleda	Sustainable Land Use Manager
Stephanie Smith*	Fire Management Officer
Michael Storey*	Fire Program Officer
Raquel Chun	Development Manager
Maximiliano Caal	Marketing & Communications Manager/YICE Business Manager
Jenny Wain*	Development Officer
Ruth Stanton-Saringer*	Development Officer
Angelia Lane*	Development Officer
Bartolo Teul	Community Liaison Officer
Herminio Sho	Agroforestry Extension Manager
Isidoro Sho	Agroforestry Extension Officer
Eugenio Ah	Sustainable Agriculture Coordinator
Nicholas Dagorn*	Agronomic Officer
Miguel Coc	Nursery Technician
Marta Pop	Nursery Assistant
Pedro Choc	Education & Outreach Manager
Amy Feinstein*	Education & Outreach Officer
Patricia Cremona*	Protected Areas Policy Assistant
Dianne Gomez	Administrative Assistant
Gaia Agnello*	Protected Areas Program Assistant
Jean Linsky*	Research Coordinator
Alyssa Thomas*	Protected Areas Project Manager
Olatz Gartzia	Research Coordinator
Marchilio Ack	Protected Areas Manager
Anignacio Makin	Ranger Team Leader, specialized in freshwater monitoring
Octavio Cal	Ranger Team Leader, specialized in freshwater monitoring
Hilberto Rash	Ranger Team Leader, specialized in navigation
Rosendo Coy	Research & Monitoring Ranger and licensed tour guide
Vigilio Cal	Ranger, specialized in navigation
Marcos Cholom	Ranger, specialized in snail monitoring
Andres Chen	Ranger
Juan Cal	Ranger
Henry Cus	Ranger
Mateo Rash	Ranger
Marcus Tut	Ranger

## Funders and Partners

Ya'axché is grateful to its long-term institutional partner, Fauna and Flora International for its support over the years and would also like to thank all those who have supported and contributed to our work throughout 2015:

- Acacia
- Caribbean Community Climate Change Centre/DFID - UK Department for International Development
- Conservation Food and Health
- Gesellschaft für Internationales Zusammenarbeit – Caribbean Aqua-Terrestrial Solutions
- Gesellschaft für Internationales Zusammenarbeit – Selva Maya
- Global Trees Campaign
- Inter-American Foundation
- Lotex Foundation
- National Protected Areas Secretariat
- New England Biolabs Foundation
- Protected Areas Conservation Trust
- Rufford Foundation
- UNDP-GEF Community-Based Adaptation (CBA) Programme
- United States Fish & Wildlife Service

## Partner organizations

- Association of Protected Areas Management Organizations
- Belize Association of Private Protected Areas
- Belize Foundation for Research and Environmental Education
- Belize Defence Force
- Colorado State University
- Fauna & Flora International
- Ministry of Forestry, Fisheries and Sustainable Development
- Maya Mountain Cacao
- Maya Mountain Research Farm
- Panthera
- Sustainable Harvest International
- Toledo Cacao Growers Association
- Toledo Institute for Development and Environment
- Toledo Agricultural Development Alliance
- University of Belize – Environmental Research Institute

## Members

Ya'axché would like to extend a heartfelt thank you to all our members who support our work through their kind monetary contributions!



# Financial statement

1st January to 31st December, 2015

## REVENUE

### Grant Revenue

Admin/Operational Reserve	235,545
ACACIA 2013	27,838
Other Income	170,317
PACT Large Grant	212,097
Inter American Foundation	182,560
USFWS HJL	32,952
USFWS Landscape	22,741
Caribbean Community Climate Change Centre NEBF 2015	218,205
CBA-Medina Bank	13,469
YICE Activities	29,762
Global Trees Campaign 2015-Year 3	42,614
FFI Institutional Agreement 2015	91,416
Rufford Foundation 2015	38,225
PACT Workshop Grant	30,055
GIZ CATS-2015	25,000
Lotex Foundation	86,433
PACT Development Grant	30,012
USFWS F15AP00942 Wildlife Security	9,890
Conservation Food & Health 2015	99,075
GIZ Selva Maya- Waha Leaf Group	39,610
GIZ Selva Maya-Farm Strategy	18,841
	24,885

### Total GRANT REVENUE

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**1,681,542**

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## EXPENSE

Salaries	567,353
Core Activities Expenses	373,252
Program Expenses	557,021
Capital Expenses	125,678

### TOTAL EXPENSE

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**1,623,303**

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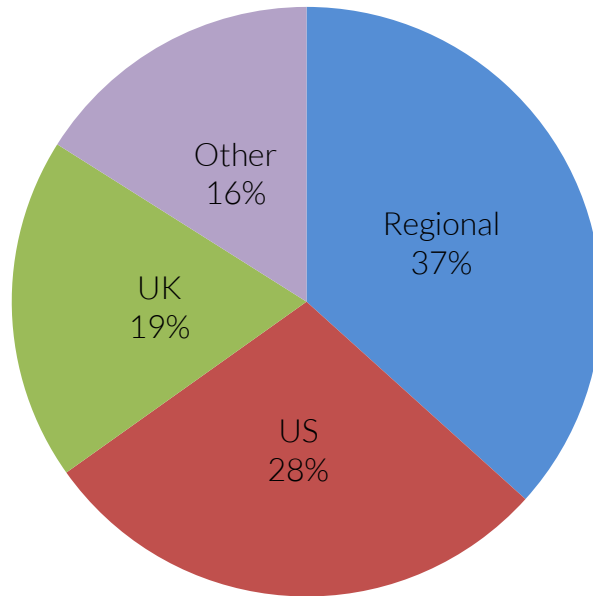
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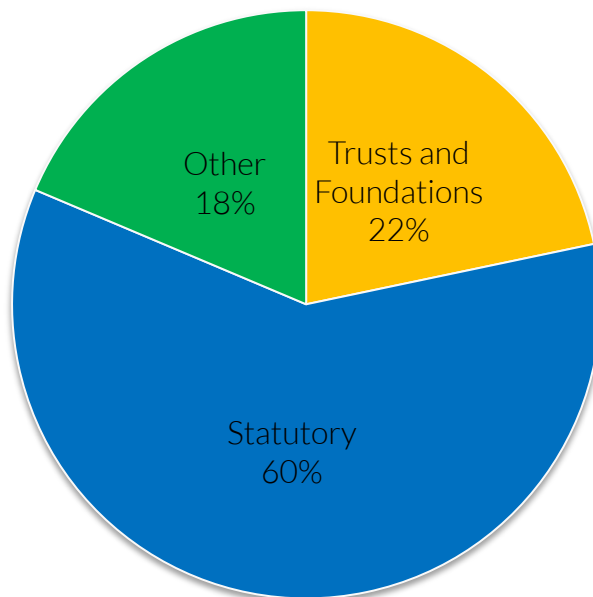
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## Geographical Origin of Funding in 2015



## Funding Source 2015







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