Darwin Initiative Main Project Annual Report

Important note: *To be completed with reference to the Reporting Guidance Notes for Project Leaders:*

it is expected that this report will be about 10 pages in length, excluding annexes

Submission Deadline: 30 April

Darwin Project Information

Project Reference	22-013
Project Title	Conserving pine woodland biodiversity in Belize through community fire management
Host Countries	Belize, UK
Contract Holder Institution	University of Edinburgh (UE)
Partner Institutions	University of Belize Environmental Research Institute (ERI), Government of Belize Forest Department (FD) International Institute for Environment & Development (IIED)
Darwin Grant Value	£298,998
Funder	DFID
Start/end dates of project	1st April 2015- 31st March 2018
Reporting period	April 2015- March 2016 Annual report 1
Project Leader names	Dr Neil Stuart (UE) and Mario Muschamp (TIDE)
Project website/blog/Twitter	http://www.tidebelize.org/project/terrestrial/darwin-initiative-community-fire-management-project Blog Post on the IIED blog about the project: http://www.iied.org/flaming-parrots-palmetto-palms
Report authors and date	Cathy Smith, Neil Stuart, Duncan Moss(UE) Mario Muschamp, Ryan Moore (TIDE), Duncan Macqueen (IIED) with additional contributions from Dr Elma Kay, Ivanna Waight and Bart Harmsen, (ERI). Rick Anderson (Everglades). 30th April 2016

1. Project Rationale

Belize's lowland pine savannas are characterised by WWF as a critical and endangered eco-region and a regional priority for biodiversity conservation because this small (2,500km^2) ecosystem contains a singular mix of North and South American species, including endangered/critically endangered species of parrot, tapir, tree and cycad palm. Darwin project 17022 discovered almost half of all Belize's endemic plants occur only within this ecosystem.

Intense fires in these pine savannas are becoming more frequent, degrading the ecosystem from a woodland ecosystem into one of mainly grassland with few pines. Some of the fires also penetrate into the broadleaf forest, causing significant loss of a flora that is not resistant to fire. This increased frequency of fire is mainly attributed to anthropogenic pressures. Hunters have traditionally set fires to promote the growth of fresh grass, which encourages game species into

the savanna, but many more fires escape from a growing number of agricultural areas that now border the protected areas in Toledo. The increase in fires is probably also happening because fewer people in these communities have the traditional knowledge about how to control fire and burn agricultural land safely. These fire risks are exacerbated by observed climate changes, such as the dry season, (hence fire season), beginning almost one month earlier now than it did a decade ago. This combination of anthropogenic factors and climatic changes led the government of Belize to identify uncontrolled fire as the single greatest threat to Belize's terrestrial protected areas and to propose that increasing capacity for fire prevention and control would be a key to enabling communities in Belize to adapt to climate change.

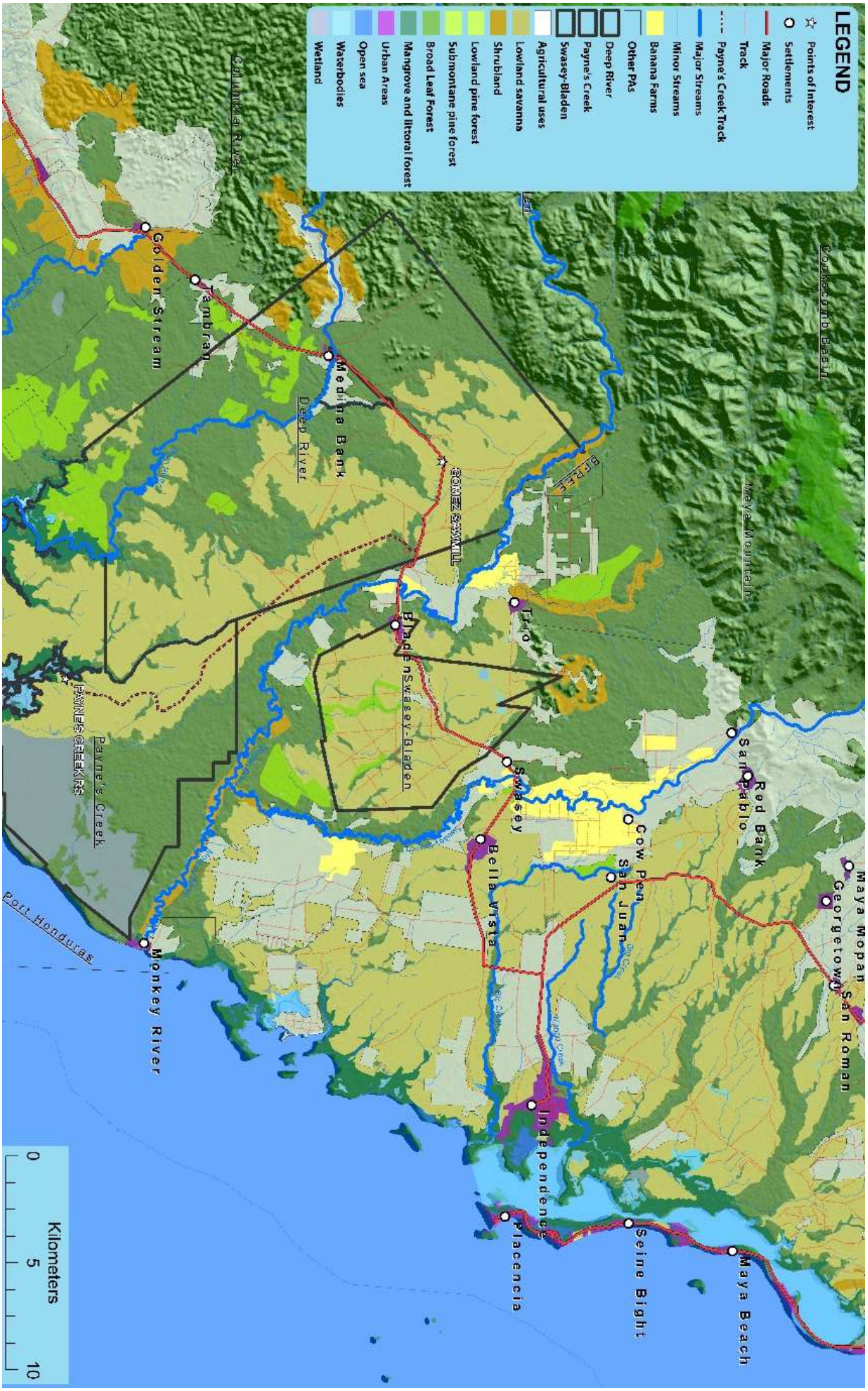
Fires are not just a threat to biodiversity in this area. Belize's Poverty Elimination Strategy recognises that communities living near to these pine woodlands are among the poorest in Belize (see Annex 4 for profiles of each community). Wildfire poses a serious risk to people's wooden houses, farms, palmetto harvest (seeds harvested in summer), and health (heavy smoke load in in the dry season). However, more careful use of fire on farmland could improve crop production, increase soil fertility and help secure the palmetto seed harvest by reducing intense fires in May-June, which burn the flowers and prevent subsequent seed formation.

This project was proposed by the Toledo Institute for Development and Environment (TIDE) and The Government of Belize Forest Department (FD), who together manage over 90% of the pine savanna woodlands of Toledo District, in three protected areas: Payne's Creek National Park (PCNP), Deep River Forest reserve (DRFR) and Swasey-Bladen Forest Reserve (SBFR). Recognising that low intensity fire every 3-5 years is a natural part of the savanna ecosystem, TIDE has been managing fire timing and intensity using a programme of prescribed burning in PCNP for over a decade, and more recently within parts of the Deep River FR also. This appears to be resulting in increased pine regeneration in both of these areas.

Belize's FD currently lacks capacity to implement its national wildfire management strategy, and to manage the many protected areas under its jurisdiction. FD recently published a new Forest Policy (2015), which paves the way for devolvement of some authority to communities to become more engaged in protected areas management and to benefit more from harvesting or using the resources in those protected areas.

This project seeks to conserve biodiversity in the pine woodlands, by increasing the capacity of both the managers of these protected areas and the communities that surround them, to control and reduce the frequency of intense, late dry-season fires. The rationale is that by giving the communities incentives to support the fire management activity, such as rights to extract non-timber forest products (NTFPs) or develop small forest enterprises (SFEs) within the areas where they assist with fire control, the communities become stewards of these woodlands and will tend to promote practices that will conserve and help restore woodland resources.

The following map shows the locations of the five project communities: Bella Vista, Bladen, Medina Bank, Trio and San Isidro (located on the outskirts of Bella Vista), together with the extents of Paynes Creek National Park, and Swaysey-Bladen and Deep River Forest Reserves.



Project communities and other settlements near to Swaysey Bladen and Deep River Forest Reserves and Paynes Creek National Park

2. Project Partnerships

Project development was a collaborative process, with all project partners involved in scoping meetings and proposal drafting. The concept initially came from TIDE, a Belizean NGO who had some experience of using prescribed burning to manage a savanna reserve, and wished to involve its buffer communities more in co-management of its protected area, Paynes Creek NP, which it co-manages with the government forest department (FD). Like many government departments in developing countries, the Belize FD manages areas rich in biodiversity but has very limited resources to implement policies such as its national wildfire management strategy. The Institute of Geography at the University of Edinburgh (UE), which has a history of biodiversity research in the Belizean pine savannas, worked with TIDE to turn the concept into a project for application to Darwin. UE is responsible for project coordination, financial control and reporting, and leads the activities involving mapping, GIS and remote sensing. With guidance from a consultant from the fire ecology group of Everglades National Park, TIDE are leading the fire management activities on the ground. The University of Belize's Environmental Research Institute (ERI) will co-ordinate the biodiversity monitoring, so that data from this and other projects can be integrated into the national biodiversity monitoring programme. IIED leads the final work package to help the communities develop small forest enterprises in the savanna areas.

All partners are actively participating in the project. There is considerable interaction between the partners on the activities. For example, maps produced by UE showing the distribution of pine woodland areas were ground truthed by TIDE. This information was then used by TIDE to locate long-term plots for monitoring the effects of fire on those woodlands, and will be instrumental for IIED and TIDE when discussing with the communities how they use these woodland resources.

This project builds upon and strengthens partnerships between the organisations. Both FD and the Environmental Research Institute of the University of Belize (ERI) were partners in Darwin Project 17022 led by UE from 2009-2012 which identified the biodiversity importance of the savannas of Belize. TIDE attended stakeholder meetings and training workshops in that project. TIDE and FD have co-managed PCNP for over a decade. Since its inauguration in 2010, ERI has worked with TIDE to improve its capacity for biodiversity monitoring, and has conducted field teaching to students at the University of Belize in protected areas co-managed by TIDE. With an office in Edinburgh, IIED has a history of collaboration with UE to research the topic of ecosystem services for poverty alleviation, and has specific expertise in developing small community-run forest enterprises that conserve natural resources and improve livelihoods.

There are naturally challenges to coordinating work when project partners are located on two continents, and in separate parts of Belize. Email, skype and google drive have enabled communication of progress and sharing of outputs throughout year 1. Additionally all partners met in person in Belize in January/February 2016 and August 2015 (with the exception of IIED).

The recruitment of the part-time Darwin project officer half way through year 1 has helped to further co-ordinate the activities and increase information flow between all project partners. As they are also a part-time PhD student at UE, the project officer has the project staff based at UE and IIED as supervisors, and also spends approximately half of her time in Belize, working closely with the Belizean project staff on project activities, and conducting her own independent research in the project communities.

3. Project Progress

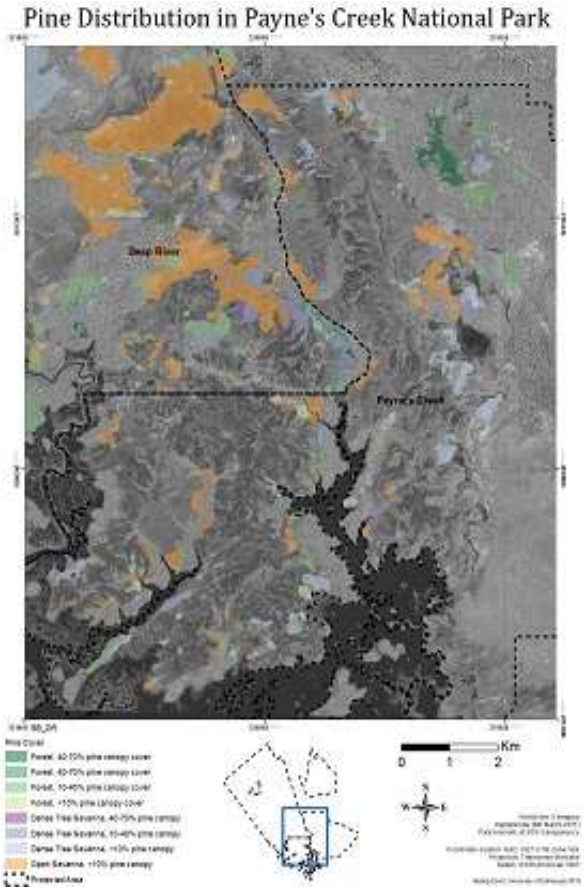
3.1 Progress in carrying out project activities

Activity 1.1 Surveys of pine stocks in PCNP

The distribution of pine was surveyed in PCNP using satellite imagery (UE) and ground truthing (TIDE). The analysis was carried out by a student on the master's course in GIS at UE and was

written up as a masters dissertation. The maps are being used to inform the location of the permanent pine and fire effects monitoring plots that are being established under activity 1.2.

Pine canopy closure	Area in Payne's Creek (ha)
High >70%	56
Med 40-70%	142
Low 10-40%	10
Sparse <10%	542
Grand Total	750



Activity 1.2 Establish 28 0.2 ha permanent plots in PCNP

Using the protocols written by activities 1.4 and 1.5, 12 permanent plots for monitoring the effects of fire upon pine, palmetto palm and cycads will be established in PCNP and 7 further plots for monitoring palmetto and cycads will be established in each of DRFR and SBFR in April and May 2016. These will be monitored at least biannually (for palmetto ad cycads) and annually for pine.

Activity 1.3 Assess distribution, abundance and productivity of palmetto palm in PCNP, DRFR and SBFR

The distribution of palmetto in PCNP, DRFR and SBFR was mapped using satellite imagery (University of Edinburgh) with ground truthing (TIDE). The analysis was carried out by a student on the GIS masters course at UE and was written up as a masters dissertation. The analysis suggests that DRFR has the greatest area of palmetto, at 854 hectares, but due to its size, this occupies only 4% of the reserve area. PCNP has a much smaller 386 ha of palmetto covering 3% of the reserve, whilst SBFR has 710 ha of palmetto covering 12% of the reserve. The analysis has informed the location of the monitoring transects set up under activities 1.2 and 1.4, which will begin to yield data of palmetto productivity in years 2 and 3 of the project.

Activity 1.4 Develop protocols for monitoring Caribbean pine and palmetto palm

The protocols (attached as annex 5) were finalised in early 2016, and provide a systematic strategy for monitoring the effects of fire on the growth and regeneration of pine, and levels of florescence and seed production in palmetto. The analyses in activities 1.1 and 1.3 are being used to inform the sampling locations for plots and transects which will be established in PCNP, SBFR and DRFR in April and May 2016, under activity 1.2.

Activity 1.5 Establish/refine protocols for monitoring key conservation targets (yellow headed parrot, the cycad palm Zamia prasina, and the fiddlewood tree) and biodiversity indicator species (birds) in line with the National Biodiversity Monitoring Program

A general monitoring strategy was designed in early 2016, by the ERI, for mammals and birds, suitable for any of Belize's protected areas and are attached as annex 6. Additionally, specific protocols for yellow-headed parrot, cycad and fiddlewood monitoring were written with specialist consultation. The yellow-headed parrot surveys will begin in April 2016, and the cycad monitoring is to be combined with the pine and palmetto monitoring occurring under activities 1.2 and 1.4.

Activity 1.6 Establish biodiversity and wildfire baselines against which effects of fire control and sustainable harvesting will be monitored

Biodiversity data collected over the past decade across two transects in PCNP is presently being analysed by TIDE. This will provide a baseline of biodiversity status before the project activities commenced. Once data collection under the protocols written in activities 1.4 and 1.5 commences in year 2, biodiversity and fire effects will be monitored within PCNP, DRFR and SBFR. This will provide a comprehensive baseline data set by EOP, against which the long term effects of community fire management, and TIDE's prescribed burning can be assessed. A preliminary GIS analysis of fire frequency and seasonality in Toledo was conducted in 2015 using MODIS data from 2010-2015, and a summary is attached as annex 10. This work will be developed further by a master's student at UE in year 2 of the project, using LANDSAT data to construct mapping of burn histories for selected areas.

Activity 1.7 Publish materials for monitoring pine woodland biodiversity and resources as part of the NTPPAM

The protocols written this year under activities 1.4 and 1.5 will be used by ERI to develop a training package to support activity 1.8 in year 2.

Activity 2.1 Community consultation on wildfire management

Community consultations began in August 2015, with initial meetings held in Bladen and Trio, at which wildfire was discussed. The turnout was considered good (~20 persons at each) and both communities agreed that more responsible fire use was necessary and signalled willingness to participate in the project and receive the training in fire management to address problems they face from wild fires.

August 2015- project awareness meeting in Bladen village

In early February 2016, the community leaders from each of the five communities were consulted to outline the project and to explain that the fire training would take place at the end of the month. The community leaders were asked to put forward names of community members to participate in the training.

In February and March 2016, 5 open community meetings were held in each community, at which some of the fire trainees shared their experiences and the perceptions of community members regarding wildfire were explored in more detail. The meetings had very different numbers of attendees, and hence required different approaches.

13/02/2016 Bella Vista: The meeting had over 30 attendees. The risks from fire to houses, farms and health were expressed. People explained how they sometimes use fire to clear their milpas, but many focused on domestic use of fire for cooking etc. Bella Vista is a very large (~ 5,000 population) community, and the need for a fully equipped fire station was expressed by several attendees.

20/03/2016 San Isidro: Approximately 20 people attended the meeting. With savanna on all sides of the village, many members recognised the risk from wildfire to thatch houses (over 90% of houses), to their milpas and the problems of poor air quality due to smoke from fires. Several community members expressed the need for a fire management committee. May of the

villagers thought that fire management equipment, as used at the fire training, should be located in the village, for administration by the village leaders.

22/03/2016 Trio: Over 60 people attended the meeting, making it difficult to hear from all attendees. Most people were not aware that a first round of fire training had taken place and felt that the village council should have publicised it more widely. Several people expressed interest in taking training next year, which will be possible, and it was felt that this would be necessary before any organisation for fire management could be formed in the community.

29/03/2016 Bladen: 31 people attended the meeting, and most were very willing to discuss their perspectives. The village has had several intense wildfires close to houses, the school and community centre in the last few years. The link between increasing fire frequency and decreasing palmetto productivity was clearly recognised. The community felt that equipment should be provided and located in the village, and should be issued by community leaders. Organisation and planning were seen as essential to deal with fire but it was feared that people would not volunteer their time without payment.

03/04/2016 Medina Bank: 11 people attended. Fire was seen as less of a risk in this village (which is not directly located in savanna), but the risk to the palmetto resource and milpas was understood, as was the potential to use planned fires constructively to protect these resources. Medina Bank is a small community, and had fire training offered by the Ya'axche Conservation Trust in 2015. Several community members have also previously undertaken the higher level of 'burn boss' training and some now obtain work in fire management for local logging concessionaires. They expressed willingness to be fire leaders in their community.

The opinions of community members gathered from these meetings will be used to design an impact assessment for the end of the project (see section 7). It will be important to consult the communities following further fire training in year 2 to discuss if/how the training is being used, and to obtain their feedback. This will inform discussions with FD and AD under activity 2.8.

Villagers in San Isidro (top left) and Bella Vista (bottom left) write and draw their views of fire (examples right)

Community consultation in Trio village

Activity 2.2 Produce materials to train community members in fire management and disseminate training materials via the NTPPAM

A two-day training course covering fire behaviour and planning for safe milpa and savanna burns was designed and delivered under activity 2.3 and 2.5. A training manual (attached as annex 7) was created to support this, and has been published by the ERI as part of the National Training programme for protected Areas Management (NTPPAM).

Activity 2.3 Train ≥50 farmers and community leaders in fire management (and Activity 2.5 Train and equip ≥50 community members to harvest palmetto seed sustainably, and manage wildfire)

(This training was initially planned for years 2 and 3. Section 9 discusses why the activities were brought forward (by a request approved by DEFRA) to year 1 and combined into one)

Two days of fire training was given to 62 community members from the five target communities (15 from Bella Vista on 22-23/02/2016, 15 from Bladen on 24-25/02/2016, 8 from Trio on 26-27/02/2015, 11 from Medina Bank on 29/02/2016-01/03/2016 and 13 from San Isidro on 2-3/03/2016. For each group there was a classroom session on the first day to explain fire use principles, and a practical session on the second day, in which participants led (with supervision from TIDE and a consultant from Everglades National Park), a prescribed burn in the Deep River Forest Reserve. Basic information was collected about each participant and stored in a spreadsheet by the project officer. 37% of the participants were female, 51% were farmers, 72% were unemployed for wage labour and 44% were palmetto harvesters.

Community members take their developing skills in fire management from the classroom to the field

There was no formal assessment of competency; however, the participants were given a practical scenario to discuss as a group at the end of day 1. Each was asked about what they had learned in the training at the end of day 2. The comments were overwhelmingly positive,

- *'I learnt that it's best to burn when you have a black line first as the fire doesn't come back to that part'*
- *'You can burn when it's dry. Or you can burn like we did today. It's a slow process. That's something I didn't know before'*
- *'I learned how much difference the changing of the breeze can make'*

with participants returning many of the key messages the training had hoped to deliver:

It was also clear from the feedback comments that both the ecological and agricultural fire use messages had been successfully combined within one single training program:

- *'For what I saw I am grateful. If there is any slash and burn for me and my husband to do I will be there telling him what to do'*
- *'For these two days I learned a lot. Sometimes people just start a fire by spiking but we need to know what area is around us to protect it'*

As well as building skills in fire use and safety, the training was a rare opportunity for the community members to take on leadership roles and engage in strategic planning as a team. The following comments suggest these aspects of group training were valued by participants:

- *'It is best to have sufficient crew members to do a burn as there are a lot of things that can go wrong'*
- *'From yesterday, you know from the table, it looks easy, you know, no sweat, no walking. I saw everyone take responsibility and we looked after each other's backs.'*
- *'The point that I see is working together is better'*
- *'I learned that you need to have the appropriate plan. You have to have a purpose and reason for what you want to get out of it'*

The fire training will continue in year 2, as several of the villages clearly showed demand for more members to be trained. Additionally, activity 2.4 will deliver more advanced, week-long 'train-the-trainer' training to several of this year's participants, enabling those people to become fire leaders in each of their communities. Participants will be supervised and their ability to provide the basic level training to a further >40 community members will be formally assessed (in completion of activities 2.3 and 2.5). Training in more sustainable (less destructive) methods of palmetto harvesting, and meetings to discuss how prescribed burns may be used to protect the palmetto resource will also occur in year 3 of the project under activity 2.5. These meetings will also provide opportunities for communities to reflect on the training, its effectiveness and the degree to which they are continuing to put it into use.

Activity 2.8 Convene meetings between TIDE, FD, Agriculture Dept., DAVCO to agree improvements to governance of rural fire use

A first round of meetings in year 1 suggest that an agreement to devolve some aspects of the governance of rural fire use to the community is widely supported by government departments of Agriculture and Forestry. It would however be dependent on demonstrating that the community members are adequately trained and equipped.

On 27/08/2015, a meeting was held with the District Association of Village Councillors, the Maya Leaders Alliance and local logging concessionaires to discuss fire governance and with FD and the Agriculture Department (AD) in Belmopan on the 28/08/2016. Senior representatives from both government departments including Belarmino Esquivel, the Director of Agricultural Extension showed willingness to devolve some authority to rural community leaders for the implementation of certain sections of the Agriculture Fires Act, especially the issuing of permits for burning. Escaped agricultural fires were recognised by both departments as a major cause of forest degradation and deforestation in Belize. The project was informed about an open consultation on the revision of the Food and Agriculture policy. Discussion revealed that nothing pertaining to fire was to be included in the new policy, and so TIDE were invited to write to the person in Forest Department (FD) in charge of the policy revision, requesting them to include into the new Policy aspects on agricultural fire management as proposed in the National Wildland Fire Policy and Strategy. TIDE made this submission to FD on 09/09/2015. At the latest project update meeting on 28/01/2016, FD representatives stated that they remained committed to the idea of devolution of fire governance. An update meeting was also held with the Maya Leaders Alliance on 03/02/2016, who also remain very positive about the idea of community fire brigades.

Upon completion of the remainder of the fire training in year 2 we will hold further consultations to gain input from community members about how a licensing or permitting system might work for them and use this information to develop firm proposals for the basis of formal agreements which we can put to FD and AD in year 3.

Activity 3.1 Undertake baseline and EoP surveys of livelihoods in five communities

The intention of the livelihood surveys planned under this activity was to provide a social impact evaluation for the project. After a detailed assessment of a number of frameworks and methods for assessing livelihoods, and discussion with all project partners in August and again in January it was decided that such surveys were not an appropriate monitoring and evaluation methodology for capturing the social impact of this project (see section 7 for a more detailed explanation). Recognising that an understanding of the existing livelihoods, demography and organisation of each community would also assist project staff in approaching the communities, the Project Officer spent a week based in each community during February and March 2016, gathering information from community leaders and members. Secondary sources, such as Belize census data (obtained from the Rural Development Office in Punta Gorda), and data from previous surveys conducted by Ya'axche, were also analysed. This has enabled a general profile of each community with recommendations for their engagement to be assembled (attached as annex 4). As described later, this information on the status of each community can be used to develop a number of social and economic indicators, against which possible improvements due to project interventions may be measured when the survey is repeated near to EoP.

Activity 3.2 Formalise license agreement(s) with Forest Department and discuss terms for community-run Small Forest Enterprises to use woodland resources sustainably.

This activity will continue throughout the project. In the first year the focus has been on opening constructive dialogues with all stakeholders and on understanding how recent changes in government forest policy and Maya land rights claims may influence routes to formalising the terms by which communities may be entitled to sustainably use resources in the three protected areas where the project is operating.

A meeting was held with the Forest Department on 28/01/2016, at Savanna Forest Station to discuss the community use of woodland resources in the light of the recent Mayan land claim court ruling and the new 2015 government Forest Policy. There was agreement on all sides that the intensity and frequency of fire is degrading the resource base and limiting people's opportunities to use savanna woodland resources. Community fire management was seen as a way to offer the dual benefit of increasing woodland resources, without requiring additional inputs (e.g. of staff time) from the FD. The new forest policy is expected to be endorsed by parliament in the next quarter and the policy includes phrasing that suggests the possibility of sharing of forest resources in some forest reserves with local communities. Opening up Paynes Creek National Park to palmetto harvesting, for example, would be an informative pilot project, which the FD could use as a model to explore community benefit sharing in national parks. Presently, extraction within national parks can only be permitted if the Minister granted special concessions. In the forest reserves, community involvement may be less problematic as the logging concessionaires who operate in these reserves are keen for communities to be incentivised to take some of the responsibility for fire management. The Forest Department's initial suggestion was that NTFP concessions might be given geographically and tied to fire management responsibilities for the same area. Methods other than granting concessions were however becoming possible, as a result of changes in the new Forest Policy and the Maya Land Rights Case. The participants at the meeting agreed: to coordinate when we have meetings between communities, TIDE and Forest Department; to endeavour to meet with Mr Paul Bradley, the current sole export license holder for Palmetto Palm.

Activity 3.3 Consulting with palmetto harvesters

The overall intention here is that the project team will try to determine the areas that are currently harvested by each community, to estimate the numbers of harvesters in each community and to discuss how the harvest could be best secured from the community perspective. However, initial discussions and time spent in the communities has led to a decision to firstly prioritise general familiarisation and trust building with the communities during year 1 in order to enhance prospects for engaging palmetto harvesters with the project and obtaining more reliable information. Once trust has been built, it can be used in subsequent years to identify the potential for other e.g. forest or NTFP businesses that the communities may be interested to develop.

Activity 3.5 Meetings with community groups to assess interest in developing SFEs

Open community meetings were held in spring 2016, at which the idea of group SFEs was introduced. The approach required for these meetings varied for the different communities: In Trio and San Isidro people were willing to write down or draw their initial ideas for businesses; however in Bladen and Medina Bank an open discussion was preferred. In Bladen, some of the villagers believed that group business might not work in their community, having had negative experiences with similar projects in the past. However, more villagers were willing to work with the idea. A similar meeting will take place in Bella Vista in early April 2016.

Some business ideas from Trio village

The following table summarises the ideas gathered at the meetings:

Community and meeting date	Number of people proposing business idea												
	Palmetto	Pineapple	Cacao	Corn/ Beans/ Vegetable	Fish Pond	Seed Bank	Tourism park or home stay	Coffee	Honey	Cardamom	Xate	Plantain	Orange
San Isidro 20/03/2016	2	5		11	1		5					1	1
Trio 22/03/2016	11	7	8	3	4	3	3	1			1	1	1
Bladen 29/03/2016			1	1	1			3	1	2			
Medina Bank	Thought to have							Thought to have					

03/04/2016	potential							potential					

Activity 3.7 Train ~20 staff from TIDE and other NGO co-managers in SFE development.

In February of year 1, a series of meetings were held to introduce ideas of SFE development attended by TIDE staff, the Maya Leaders alliance, other local NGOs Humana and Ya'xche and community leaders from each of the five communities. At this initial stage, the focus was on how enhancing small forest enterprise development might act as an incentive for communities to take part in fire management – which would in turn improve the resource base on which any of these small forest enterprises would depend. Some of the potential benefits of undertaking these businesses as organised groups were introduced: to achieve scale for negotiating sales prices; to share and thereby reduce input costs; to improve information on the market chain, alternative buyers, and value adding opportunities, etc.. A 'business primer' has been prepared in year 1 for TIDE and project staff to use in introducing the ideas of SFE businesses to the communities (see annex 8). Possible milestones for assessing progress on this activity over years 2/3 will be (i) agreeing to work together as a business group; (ii) developing an approach to protecting the resource; (iii) identifying ways to improve business know-how, (iv) developing a marketing strategy and (v) exploring ways to register a business group. An exchange visit has been planned at the start of year 2 for community leaders and TIDE staff to travel to a leading Guatemalan umbrella cooperative to learn about group business activities that have been developed by similar small village communities in the sectors of Timber, Cacao, Coffee, Honey and Ecotourism. A Learning guide will be prepared for participants in this exchange.

3.2 Progress towards project outputs

Output 1 – establishing resource and biodiversity baselines

This output creates protocols for monitoring the extent and condition of Caribbean pine and palmetto palm, and for assessing changes in the biodiversity status of the savanna woodland by monitoring certain groups of species (mammals, birds) and also the critically endangered Yellow Headed Parrot. Monitoring of these target species is designed to capture the effects of harvesting and of changes in the fire regime during the project lifetime, as well as building the capacity within the organisations for this monitoring to continue in the future. The output indicators are reports presenting the baseline data, and the monitoring methods and protocols themselves, which will be published when adopted by the relevant organisations as, part of ongoing national biodiversity monitoring programmes. Progress in year 1 suggests that we will fully complete this output by the end of year 2. Baseline mapping of the pine woodland distribution has been assessed using GIS and ground-truthed for PCNP (baselines already exist for DRFR and SBFR as these are pine logging concessions), and baseline mapping of palmetto distribution has been created from satellite imagery and ground-truthed for PCNP, SBFR and DRFR. All the monitoring protocols required have now been written (annexes 5 and 6) and are undergoing field-testing in PCNP and in other selected PAs in Belize. Comprehensive and systematic monitoring will begin at the start of year 2 to create baseline data sets for pine and palm productivity and biodiversity and repeat monitoring will be undertaken at least annually for all the monitoring targets.

Output 2 – training in biodiversity monitoring, prescribed burning and community enterprise development.

This consolidates the different training outputs, with a focus on building a sustaining national capacity for conducting these activities. The overall purpose is to deliver a range of training that will enhance the capacity of PA managers, NGO staff and community leaders to 1) monitor both biodiversity and wildfire effects in savannas, 2) to establish community fire management, and 3) develop group SFEs. The indicators are the numbers of people trained in each activity, with targets of 20 staff from PAs trained in biodiversity monitoring and 15 staff from NGOs trained in prescribed burning. The final indicator is that 20 staff from NGOs will have attended training so they understand what is required to screen and develop ideas for community forest enterprises.

Although there is also training of local project communities in years 1 and 2, these output indicators focus on creating a stronger capacity within organisations nationally, so that local organisations will be able to continue these activities and train further people beyond EoP. Both the training of community members and the NGO training in biodiversity monitoring will be completed during year 2, and the remaining outputs will be achieved in year 3.

Output 3 – operationalising community fire management

The purpose of this output is to have teams of community members trained in fire management, both in the savanna and on their milpas, with output indicator being the numbers of community members trained (target: 50 palmetto harvesters and 50 farmers by EoP). The output indicator was originally written assuming two separate 2 training programs - one for savanna fire management and one for safe agricultural burning. However, it has been more effective to combine the two into a single 2-day training package, which will more effectively train the same numbers of people. There are several reasons for this: the same understanding of fire behaviour, weather conditions, equipment etc. is required for any type of prescribed burning; many farmers are also palmetto harvesters; if the people trained are expected to form a fire management group in their communities, it is better to work with them as one group. In year 1, 62 people in total were given this training (51% of them farmers, and 44% palmetto harvesters). The output should be fully achieved by the end of year 2 with a further >40 people receiving fire training during year 2.

Output 4 – securing a sustainable palmetto harvest

The purpose of this output is to secure the palmetto harvest from the protected areas (which currently has no legal basis) for community members into the future. This may require different means of organisation in the different communities. The output indicators are a report summarising the current harvesting situation for each community (areas harvested, numbers of harvesters etc.) and a documented process of consultation between the communities and the FD aimed at establishing the basis for a legal mechanism to secure rights to harvest and a basis for regulating the harvest for different community situations. This output has been revised from the original project proposal following discussions with FD and the Maya Leader's Alliance during year 1 and the publication of the new government Forest Policy in 2015 (see section 8). The indicators are now more suitable and more likely to be achieved by EoP, with research into palmetto harvesting by each community commencing in year 2, together with the development of an SFE idea with each community under output 6. Several communities for example may wish to organise a group business around palmetto harvesting.

Output 5 – a sustainable extraction plan for PCNP

The purpose of this output is to assess the possibility of sustainable extraction of pine and non-timber forest products NTFPs such as palmetto from PCNP. A plan setting out the ecological and socio-economic implications of such an extraction zone, and determining sustainable extraction levels will form the output indicator. The activities under this output are scheduled for years 2 and 3 of the project, and the indicator is still suitable. The pine distribution data already collected under output 1 will form an important input for the sustainable extraction plan, along with TIDE's ecological datasets for PCNP, and the sustainable extraction plan recently produced for a neighbouring pine logging concession in DRFR.

Output 6 – business planning for small forest enterprises

The purpose of this output is to develop group SFE business plans with at least three community groups. The plans themselves will provide the output indicator, and should be suitable for presentation to possible investors, such as the 'Key Biodiversity Areas Project', which is led by the Belizean Government and is currently calling for proposals for community businesses. Much of the activity under this output is scheduled for year 2 of the project. Consultations held in year 1 suggest that the indicator remains suitable, with community members interested in developing SFEs, and putting forward their initial ideas. In addition to the activities originally proposed under output 6, further funding has been secured from the UN-FAO to enable a representative from each of the five communities to accompany a representative from TIDE and FD and the project officer, for a week-long regional exchange in April 2016. The exchange will visit a successful community run business (FEDECOVERA http://www.fedecovera.com/index.php?lang=en) in Alta Verapaz, Guatemala. Following this

trip, meetings will be held in each community, to take one of the suggested business ideas further with an interested group, with further business training and business plan writing taking place by the end of year 2.

3.3 Progress towards the project Outcome

The desired project outcome is the conservation of biodiversity in the pine woodlands of Southern Belize. The project aims to achieve this by creating a programme of community-based wildfire management, incentivised by securing woodland resources for community use and by developing SFEs with community groups. There are four indicators associated with this outcome, all of which remain suitable and on track for achievement by EoP.

Indicator 1 is to establish capacity in local organisations so that they can monitor and report to check that biodiversity is being conserved in the project area. In Year 1, all the monitoring protocols have been devised and these will be implemented in year 2 of the project. These will establish the baselines against which any positive or negative effects on biodiversity occurring both during and after the project will be measured. The results will be reported within the consistent national framework of the National Biodiversity Monitoring Programme using national protocols that have been agreed through consultation with national and international experts, co-ordinated by the University of Belize ERI. The project has facilitated the publication of these by the ERI, creating a lasting contribution to national capacity building for biodiversity monitoring.

Indicator 2 is to reduce the frequency of severe and uncontrolled wildfire, principally by introducing community wildfire management. During year 1, we have designed a method for analysing wildfire frequency in the project area over the last ten years using satellite data. This will be implemented in year 2, and will produce results so that the extent and timing of wildfire during the project and into the future can be monitored and reported. The first round of training with community members has been successfully completed in year 1. Further training in year 2 paves the way for the establishing community fire management teams capable of handling savanna wildfires, permitting and conducting safer milpa burning, and conducting their own training of further community members, all of which will increase the capacity of communities to control and reduce the damaging effects of uncontrolled wildfire.

The third outcome indicator is the sustainable use of woodland resources. Year 1 has seen the creation of pine and palmetto distribution maps to assess the distribution of the woodland resources, and the development of palmetto and pine monitoring protocols that will be implemented from year 2. These maps and methods will enable sustainable extraction rates to be determined and reported in a sustainable harvesting plan to be developed in years 2 and 3. Training local people to harvest palmetto seed in non-destructive ways and providing them with equipment in year 3 so they do not need to cut down the tree to harvest the seeds will further contribute towards more sustainable harvesting practices.

The final outcome indicator is that communities should obtain livelihood benefits. In year 1 of the project, first steps were taken to assess the interest of the different communities in creating small forest enterprises (SFE). Members shared their thoughts about possible business ideas at five community meeting. These were reported under activity 3.5 above. Since all communities expressed interest in finding out how these group business might be set up, an exchange visit has been arranged to take place in year 2 in which representatives from each of the communities will visit established community business in nearby Guatemala. This will be followed by provision of business training and assistance to develop basic business plans in year 2, so that the groups can seek to attract investment to start-up some SFEs in year 3 of the project. One particular scheme aimed at developing small community enterprises, funded in Belize by UNDP-GEF has been identified as the initial target for seeking investment.

3.4 Monitoring of assumptions

Year 1 of the project has seen the outcome and output level assumptions hold true:

The government FD has remained positive about the project activities and participated actively in meetings held in August 2015 and January 2016. However, they did not, when invited, attend a fire training session in February 2016, or attend any of the community consultations. Effort

will be required in year 2 to encourage FD staff to continue to engage with as many of the project activities as possible.

All project partners have delivered on their respective project activities approximately as planned, with some minor exchanging of activities on either side of the boundary between financial year 1 and year 2 to take advantage of weather conditions in January-March that make it a more suitable period for conducting fire training than April-May. Two rounds of stakeholder meetings have been held in August 2015 and January 2016 to ensure a mutual awareness of the project and its progress. There has been good attendance by community leaders and members at community meetings and at the fire training events (although three of the communities sent less than the suggested number of 15 participants). TIDE has also been working co-operatively with the Ya'axche Conservation Trust, another local NGO conducting similar fire training work in their buffer communities, and a joint fire awareness stall at a local farmer's event is planned for mid-April. There has thus been more consultation and co-operation than originally assumed.

There have been no major natural disasters. The national ranger training and protected areas programs, into which project monitoring protocols and fire training manuals will feed, remain well supported by their respective institutions. Telephone conversations in 2016 with Paul Bradley, the current exporter of palmetto from Belize suggest that the market for the product remains buoyant.

One original assumption of output 4 was that concessions would be the best way to secure the palmetto harvest for community members. Discussions with FD, as well as an increased understanding of the complexity of the palmetto harvest by community members suggest that this may no longer be the case and for that reason a change request was submitted in Year 1 and has been approved, resulting in a rewording of the output (see section 8 for more details).

3.5 Impact: achievement of positive impact on biodiversity and poverty alleviation

Biodiversity conservation and poverty alleviation do not always go hand-in-hand, and some compromise is required in projects that aim to achieve both. Three streams of work in this project will work towards achieving both aims:

Firstly, community fire management (outputs 2 and 3) will lead to reduced risk of escaped fires causing ecologically destructive wildfire in the savanna. At the same time, it will enable community members to protect their livelihoods and homes, and develop new skills.

Secondly, legalising palmetto extraction from the reserves (output 4) will secure a resource for community members and incentivise good fire management. If harvesting methods are improved, and extraction monitored, the negative ecological impacts of the harvesting can be minimised.

Finally, developing plans for community group SFEs (output 6) will enable community members to build or strengthen their livelihoods, business skills and social connections. If appropriately linked, the SFEs will incentivise and support the fire management. Whilst they involve resource use, these new opportunities may provide a more sustainable alternative to the more ecologically destructive activities such as logging and hunting that presently occur illegally in these areas.

4. Project support to the Conventions (CBD, CMS and/or CITES)

This project addresses several Aichi targets. The community fire management we will develop responds to the need for actions whereby 'degraded ecosystems may be enhanced through in situ conservation and restoration, contributing to climate change mitigation (targets 14-16). The community forest enterprise component will provide 'economically sound, positive incentives for promoting conservation and sustainable use of biodiversity' (target 3), whilst the community fire management will enable local communities to participate in conservation (target 18). Enabling communities to negotiate access to woodland resources and obtain licenses for sustainable

extraction are the types of 'short term measures' suggested in Annex 1 to UNEP/CBD/COP/12/6 through which 'NGOs and communities may negotiate mutually agreed terms for benefit sharing'.

The project supports Belize's signatory commitments to various UN-CBD articles, including (6) national strategies for biodiversity monitoring and conservation; (7) identification & monitoring of components requiring urgent conservation; (8) restoring degraded ecosystems by balancing sustainable use/conservation; (10) informing national biodiversity strategy; (11) providing economically and socially sound incentives to conserve biodiversity and promote sustainable use; (12) establishing research/training programmes; (13) promoting public education and awareness and (15) enabling access to resources and benefit sharing.

FD is the National Focal Point for the CBD in Belize, and as a project partner is regularly updated with project progress. The project outputs will also enable FD to implement elements of the National Wildland Fire Management Policy and Strategy and its new Forest Policy.

5. Project support to poverty alleviation

The five communities targeted are amongst the poorest in Belize (as recognised by Belize's Poverty Elimination Strategy), and have few opportunities for employment, besides labour on surrounding banana plantations. Many adults have not been educated beyond primary school level (see annex 4). This project will strengthen links between TIDE and buffer communities in the protected areas it manages and will improve the capacity of the organisation to contribute to sustainable development in the area. As discussed in section 3.5, the project aims to support poverty alleviation in a number of ways.

The fire training will have several indirect, long-term benefits to community members if it results in reduced numbers of intense or uncontrolled wildfires. Participatory exercises at community meetings (under activity 2.1) suggest that community members recognise fire as posing a serious risk to their livelihoods, homes and health. There are also direct benefits for those taking the fire training, who will develop new marketable skills and leadership experience, as well as receiving a stipend for attending. The training also helps local people understand the work of TIDE and the functioning of an NGO.

Work to secure the harvesting of palmetto and other NTFPs by community members, both legally and practically by introducing less destructive and more sustainable harvesting methods, will allow them to obtain more direct economic benefits from these savanna areas in the future. Furthermore, the ideas for SFEs that we plan to develop with community members in years 2 and 3 will create the potential for greater economic benefit and also the social benefits that often derive from engaging in group businesses.

6. Project support to Gender equity issues

The project is committed to promoting gender equity. In Belize, agricultural fire use would usually be considered a male responsibility, so it was highly encouraging to see that 37% of the community members undertaking fire training under activities 2.3 and 2.5 this year were women. At one of the sessions, the sole female participant gave the feedback: '*I am the only woman that came and did it and it's because I want to learn*'. This suggests that the project is and will continue to provide opportunities to women to expand their roles within the community.

7. Monitoring and evaluation

To monitor progress against the activities for year 1, all project partners have met at six-monthly intervals in Belize, to discuss and evaluate progress against the project logframe and to flexibly make minor adjustments to project activities when it has been clear that this was either necessary for practical reasons or represented a more effective way of achieving overall project objectives. This review and monitoring will continue in years 2 and 3 of the project.

We have learnt that monitoring and evaluating the social impacts of the project will require both qualitative and quantitative approaches. Community meetings, which will be held throughout the project, will be used as opportunities for project staff to hear direct feedback from the

communities. Effort will be made to use participatory activities that allow all community members the opportunity to voice their opinions.

Activity 3.1 (livelihood surveys in years 1 and 3 to evaluate the impact of the project) was intended to measure the socio-economic impacts of the project. However, it has been decided not to conduct a full socio-economic survey for several reasons. Economic benefits from *securing* the palmetto harvest will accrue mainly in the future, beyond EoP. There is also no guarantee that the SFE plans written will be able to attract external finance so they can start within the project lifetime. A full economic survey of livelihoods in each of the five communities would be disproportionately time consuming, requiring months of effort to gather a statistically meaningful data set to detect change in each community. This is not justifiable, considering that many of the quantifiable economic benefits may not be evident within the project lifetime, whilst many of the more intangible or social benefits may not be easily captured in a quantitative livelihood survey.

Instead, a combination of methods will be used to provide a socio-economic impact evaluation for the project. During the consultation meetings in year 1, the communities were asked to provide their 'visions' of what, for them, would constitute a better situation regarding wildfire and this was used to develop meaningful indicators of project progress for each community. At EoP, these ideas will be used in a participatory exercise where community members will assess how far the project achieved these indicators of success. Additionally, the social impacts of the project will be documented by the Project Officer over the next 3 years, as part of her related PhD research, which will also document more widely the perspectives of the communities on fire and the use of woodland resources. Both quantitative and qualitative approaches will be employed, using methods for eliciting the impacts of similar projects on local communities that have been found to deliver acceptable, resource-efficient indicators for monitoring and evaluation.

8. Lessons learnt

The most important lessons learned in the first year have probably been those around the engagement of the local communities. Firstly, to recruit participants in each community, we relied on their leaders to select people. Whilst it is important to have the support of community leaders, it may have been more inclusive to have presented the opportunity at an open meeting. Feedback at community meetings held after the training suggested that, particularly in Trio village, many community members had not been informed of the opportunity, and some of those trained were not confident to share their experience with other community members. From our work in year 1 we have gained key contacts in each community that can help in engaging others, and have built the contextual understanding that will help us to tailor our approach in each community next year.

Another key lesson learned is that more research and consultation is needed to understand the needs of the communities and how best to design an agreement securing the palmetto resource for each community. Originally, output 4 of the project had specified that palmetto concessions would be established. However, meetings with the Forest Department and the Maya Leaders Alliance throughout year 1 helped us to understand that concessions are not the only possible or preferable legal framework for achieving this. The 2015 *New Forest Policy* and the outcome of the 2015 *Maya Land Rights Case* at the Caribbean Court of Justice (both occurring since the project proposal was written) open the doors for alternative mechanisms of community forest management, particularly on Maya community land (which applies to three of our five project communities). It might be that different agreements are required for different communities (the five project communities are of very different sizes and cultures). Ultimately, the agreement will need to work for the community, and this will require more detailed consultation with them. As a result of learning this, a change request for output 4 was submitted and approved, and we are now reporting against the updated framework.

9. Other comments on progress not covered elsewhere

In addition to changes detailed in sections 7 and 8, the plans for the fire training were also adapted this year. It was decided to move forward the first round of fire training by a few months from year 2 into year 1. This earlier schedule was necessary to avoid carrying out training in the hottest part of the dry season in April or March, when the risk of escaped wildfires is much greater. Having now successfully engaged a group within each community with the concepts of fire management, we also felt it important to maintain this momentum during year 2. The next stage calls for two people from each community to receive further and more comprehensive training so that they can begin to take on responsibility for fire prevention and control (activity 2.4). A change request was submitted, and has been approved, to bring forward this second stage of training from year 3 to year 2, to reinforce the basic training, and enable these community 'burn bosses' to start to train others before the end of the project.

10. Sustainability and legacy

Probably the main outputs in year 1 that will contribute to ensuring project legacy are that

(1) a strong network of local partners has been developed,

(2) we have obtained positive engagement from all five project communities, and

(3) excellent sets of materials for fire training and biodiversity monitoring have been produced and these are being adopted by appropriate national institutions.

The project has successfully engaged all relevant actors as either partners or active consultees in the project. The active partners include the government focal point for the CBD (FD), the national research and training institution (ERI), and the main NGO (TIDE). We have established good working relationships with all five target communities, as well as with logging concessionaires working the local PAs and with the Maya Leaders Alliance. We have also made contact with the sole buyer and exporter of palmetto seed in Belize.

Over 60 members of the local communities have already received training in basic fire management and control. In years 2 and 3, the project will build further capacity, by providing training in fire effects monitoring, community fire training and SFE development to NGO staff in other Belizean organisations, as well as further fire training for the local community members. All of the trainees will be Belizean and a significant number may be expected to remain in their local communities and be able to offer further training to their neighbours.

All of the training materials developed by the project partners have been designed so they can directly integrate within existing national training programmes. The biodiversity monitoring protocols created this year, once field tested, will be adopted by the National Biodiversity Monitoring Programme run by the University of Belize's Environmental Research Institute. This programme collates and reports on the biodiversity status of all Protected Areas in Belize and the data are used to produce the country report for Belize to the UN-CBD. Similarly, the fire training materials have been adopted by the ERI who co-ordinate the National Training Program for PA Managers. This program, established initially by UNDP and GEF, is the only national professional accreditation route for staff working in protected areas management in Belize. Embedding our outputs in these nationally recognised programmes will help to increase their uptake, their reach and the possibility that they will continue to be used widely in the future.

The government FD has shown interest in using this specific project to explore more generally how it may devolve licensing of rights to use forest resources to the community level, since community use is mentioned for the first time in the new (2015) Forest Policy. FD is viewing this Darwin project as a pilot, with potential to inform decisions about community resource use in other PAs in Belize. If new forms of agreements or legal changes are brought about as part of consultations undertaken within this project, they will be part of its lasting impact.

11. Darwin Identity

This project follows on from DI project 17022, and hence builds on an awareness of partner organisations in Belize about the Darwin Initiative. The Darwin logo has been used on all training manuals and monitoring protocols produced in year 1 and features prominently on the certificates awarded to the community members completing the fire training, and project awareness leaflets used at community meetings (see annex 9). A national radio broadcast on LoveFM on 24/02/2016 described the fire training of community members by the Darwin Initiative. A blog about the project written by IIED http://www.iied.org/flaming-parrots-palmetto-palms is circulating widely and generating a variety of comment. A video about the project published by TIDE on their website (https://www.youtube.com/watch?v=HEr9NoZqE7w) has already received over 1,000 views. The project is also being publicised on Twitter by the British High Commission in Belize.

Bella Vista's fire trainees present their certificates

12. Project Expenditure

Table 1 Project expenditure during the reporting period (1 April 2015 – 31 March 2016)

Project spend (indicative since last annual report	2015/16 Grant (£)	2015/16 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)			+0.45%	
Consultancy costs			-0.94%	
Overhead Costs	0	0		
Travel and subsistence			+0.32%	
Operating Costs			+0.90%	
Capital items (see below)			+ 4.92%	
Others (see below)			-15.83%	*see footnote

TOTAL			+0.02%	

**The % variance for other items exceeds the normal limit +/- 10% however the absolute variance in real monetary terms is £95 out of a small budget of £600 and we do not consider this to be significant in terms of overall project budget and does not impact project outcomes in any way.*

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2015-2016

Project summary	Measurable Indicators	Progress and Achievements April 2014 - March 2015	Actions required/planned for next period
Impact Biodiversity of pine woodlands is conserved throughout Belize, enabled by an increased national capacity for community-based wildfire control that is founded upon a just and sustainable use of these woodlands.		National institutional capacity for monitoring the effects of wildfire upon biodiversity has begun to be strengthened by the development and publication in year 1 of protocols and training materials through the National Biodiversity Monitoring Programme of the Environmental Research Institute at the University of Belize. These materials will now be adopted by NGOs throughout Belize and will be used from 2016 onwards for training in biodiversity monitoring. Institutional capacity for fire control has begun to be increased by the development of training materials published nationally as a module of the National Training Program for Protected Areas Managers. These materials will be used for training all PA managers and rangers from 2016 who seek accreditation under this national program. The above materials have been used to run a successful first round of fire management training for 62 members in all 5 of our target communities in the Toledo District of Belize. Baseline mapping of pine and palmetto resources has been completed for all three PAs in which the project is taking place. Productive consultation about resource sharing has taken place with all 5 project communities, the Maya Leaders Alliance and Forest Department. Surveys have been completed in all 5 communities to create baseline assessments against which the communities themselves may report any positive impacts of the project by EoP.	[redacted]
Outcome Biodiversity of pine woodlands in southern Belize is conserved by developing community-based wildfire management,	**1**. Biodiversity is monitored and conserved **2**. Wildfire is reduced by participation of	(Report on progress towards achieving the project outcome, e.g., the sum of the outputs and assumptions) **1.** Baseline pine and palmetto distributions	**1.** Comprehensive monitoring of pine, palmetto and all key biodiversity indicators will begin in year 2 in the project area. **2.** In year 2, two people from each

with local communities incentivised to participate through a more just and sustainable use of woodland resources.	≥100 community members in wildfire management **3**. Woodland resources are used sustainably **4.** Local communities obtain livelihood benefits.	have been assessed using GIS and ground-truthed. Biodiversity baselines are being established using TIDE's existing monitoring data. Pine, palmetto and biodiversity monitoring protocols have been written and are ready for implementation. **2.**. A first round of training in savanna and milpa fire management has been conducted with 62 community members from all 5 project communities. **3**. Scheduled to begin in year 2 **4.** The first steps have been taken towards understanding interest in SFEs in each of the communities, with members sharing their thoughts about possible business ideas at community meetings	community will receive comprehensive follow-up training so that they can take on responsibility to lead a community fire management group. They will train a further >40 community members as part of their 'burn boss' training. **3**. In year 2, the current palmetto harvesting situation will be researched, used to develop a sustainable harvesting methodology, and a legal mechanism to secure the harvest for community members, The possibility of sustainable pine extraction from PCNP will be assessed. **4.** At the start of year 2, representatives from each community will visit a successful group SFE in Guatemala. These people will then be instrumental in developing and leading groups to receive business training and to write SFE proposals.
OUTPUT 1. Biodiversity and woodland resource baselines are established for pine savanna woodlands within Toledo District and monitored during the project to provide evidence that biodiversity is being conserved and in some cases may have been enhanced during the project period.	**1.** Measures of abundance, diversity, distribution and/or condition of animals (A. oratrix and bird indicator species) and plants (P. caribaea, Z. prasina, V. gaumeri, A. wrightii) in PCNP, DRFR and SBFR will be recorded using protocols developed under the project (e.g. roost counts, transect surveys, point surveys, vegetation plots, etc.) for Belize nationally by the ERI and TIDE based on international indicators suggested by UNEP/WCMC, Panthera and WWF. Availability of baseline data for PCNP will have increased from one of these monitoring targets (birds) at present to six by end of project (EoP). Revision of the bird monitoring protocol is required to coordinate with other PA. Baseline data for DRFR and SBFR will have increased from one of these monitoring targets (Caribbean pine) to two (pine and palmetto).	Pine and palmetto baseline distribution has been assessed as planned for PCNP (pine) and PCNP, SBFR and DRFR (palmetto). All monitoring protocols were written in year 1 and published nationally (with the exception of Fiddlewood, which is a broadleaf transition species, and not applicable to the savanna). Monitoring will commence at the start of year 2 of the project, so that by EoP baselines for all monitoring targets will exist for each of the 3 protected areas, against which monitoring can continue into the future.	
Activity 1.1 Surveys of pine stocks in PCNP (TIDE, FD)		In 2015 a GIS analysis of the pine distribution in PCNP was completed, with mapping produced and the work written up as a masters thesis. Reported in list of publications. In years 2 and 3 of the project the permanent monitoring plots that are being set up under activities 1.2 and 1.4 will provide richer information regarding the pine stocks.	

Activity 1.2 Establish 28 0.2 ha permanent plots in PCNP (TIDE, FD)		The monitoring protocols needed to collect data from the permanent plots have already been completed under activity 1.4. These are presented as Annex 5. It was decided to combine pine and palmetto monitoring within the same plots for PCNP, as well as establishing plots for palmetto only in SBFR and DRFR. The locations for the plots are being finalised, based upon the analyses completed in activities 1.1 and 1.3 and will be established in April 2016. Maps showing the finalised locations of the plots and associated transects will be presented in the 18 month report. These plots will be monitored annually (for pine) and 2-3 times for palmetto during years 2 and 3, at times best suited for detecting the effects of fire on productivity.
Activity 1.3 Assess distribution, abundance and productivity of palmetto palm in PCNP, DRFR and SBFR (TIDE, FD)		Distribution and abundance mapping has been completed. In year 1 a GIS analysis of the palmetto distribution in PCNP, SBFR and DRFR was completed. Maps have been produced and the work written up as a masters dissertation. The maps are ilustrated in the thesis which are freely downloadable from the URLs in the list of publications. In years 2 and 3 of the project the monitoring transects set up under activities 1.2 and 1.4 will begin to provide data regarding the productivity of the palmetto.
Activity 1.4 Develop protocols for monitoring Caribbean pine and palmetto palm (TIDE)		This activity has been completed. In January 2016 the pine and palmetto monitoring protocols were devised, discussed and written up. Monitoring using the protocol, in the plots established under activity 1.2, will begin in April of year 2 and continue in year 3 of the project. Annex 5 provides the protocols for monitoring Caribbean Pine and Palmetto palm.
Activity 1.5 Establish/refine protocols for monitoring key conservation targets (yellow headed parrot, the cycad palm Zamia prasina, and the fiddlewood tree) and biodiversity indicator species (birds) in line with the National Biodiversity Monitoring Program (TIDE, ERI)		Following consultation with relevant specialists throughout year 1 co-ordinated by the ERI, in early 2016, specific biodiversity monitoring protocols were completed for Yellow Headed Parrot and Fiddlewood, and generic protocols completed and written up for birds and mammals. The draft protocols were published in March 2016 by the ERI as part of the National Biodiversity Monitoring programme and the protocols will be field tested in year 2 of the project, so the publication can be revised accordingly. Monitoring will begin in years 2 and 3 of the project. Annex 6 provides the protocols published by the ERI under activity 1.5.
Activity 1.6 Establish biodiversity and wildfire baselines against which effects of fire control and sustainable harvesting will be monitored (TIDE)		Biodiversity data collected over the past decade within 2 transects in PCNP is presently being analysed by TIDE. This will provide an initial indication of biodiversity status before the project activities commenced. Once activity 1.2 is completed, and data collection under the project's design commences, more comprehensive baseline data on biodiversity and fire effects will be collected, both within PCNP, DRFR and SBFR. This will provide a baseline data set, against which the long term effects of this community fire management project can be assessed. A baseline GIS analysis of fire for the area was conducted in 2015 using MODIS data from 2010-2015, and is attached as a report (annex 10). This first analysis will be built upon by a master's student at UE in year 2 of the project.
OUTPUT 2. Training to enhance national capacity to a) monitor savanna biodiversity / resources; b) provide training in best practices for agricultural fire use; c) develop small forest enterprises.	**2.** The number of people in Belize capable of monitoring all of the species under output 1 will have increased by ~30 from ≥10 at present. The number of people in Belize capable of providing training in safe use of agricultural fire will have increased by ≥15 from ≥5	This output will largely be achieved in years 2 and 3 of the project. The specific outputs will be based on the knowledge, skills and materials developed in years 1 and 2 of the project. The purpose of this output is to make the monitoring and training procedures developed for monitoring biodiversity available nationally, to increase the number of Belizeans qualified to provide training themselves in fire management and to increase the number of Ngo staff in Belize who can provide training in SFE business screening and development. The materials needed to deliver the biodiversity and fire training under this output have

	currently. The number of NGO personnel competent to develop SFEs will have increased by ~20 from an estimated ≥10 at present.	been designed successfully in year 1. This indicates that this output should be completed by EoP. The indicators are still suitable.
Activity 1.7 Publish materials for monitoring pine woodland biodiversity and resources as part of the NTPPAM (ERI, TIDE)		Materials will be developed by the ERI to support activity 1.8 in year 2.
Activity 1.8 Conduct national training workshops in biodiversity monitoring for ~30 PA staff (ERI)		Scheduled for year 2
Activity 2.4 Train ≥15 PA personnel and community leaders to deliver further training as provided in 2.3 beyond EoP (TIDE, Everglades)		Scheduled for year 2
Activity 3.7 Train ~20 staff from TIDE and other NGO co-managers in SFE development (IIED)		Scheduled for year 3
OUTPUT 3. (note this is a changed output from the original proposal) ≥100 community members are trained in fire management (≥50 palmetto harvesters trained in fire management for pine savannas and ≥50 farmers trained in best practices in use of agricultural fire)	**3.** The number of community members trained in: a) fire management for pine savannas; and, b) best practices in use of agricultural fire, will have increased by ≥50 each from baselines of 10 and 45, respectively.	The outputs and indicators were originally written with two different training programmes in mind - one for savanna fire management and one for safe milpa burns - however, it was decided it will be both more efficient and more effective to combine the two into a single, common, 2-day training package. This will still train equivalent numbers of people. In year one, 62 people in total were given this training (51% of them farmers, and 44% palmetto harvesters). The output is expected to be fully achieved by the end of year 2 since a further >40 people are planned to receive the training in year 2. The slightly revised indicator is still considered very suitable for assessing the training.
Activity 2.1 Community consultation on wildfire management (TIDE, FD)		Initial consultations completed in all 5 communities. Wildfire management was discussed at community meetings on the following dates: August 2015 Bladen and Trio villages 13/02/2016 Bella Vista 20/03/2016 San Isidro 22/03/2016 Trio 29/03/2016 Bladen 03/04/2016 Medina Bank Although this activity has been completed as originally written, the project has decided that further additional consultations will be held after fire training in year 2 to discuss how the skills gained will be taken forward in the communities
Activity 2.2 Produce materials to train community members in fire management and disseminate via NTPPAM (TIDE, Everglades)		Activity completed. The fire training materials were developed, reviewed and published as a training module within the NTPPAM. They are attached as annex 7
Activity 2.3 Train ≥50 farmers and community leaders in fire management (TIDE, Everglades) **Activity 2.5** Train and equip ≥50 community members to harvest palmetto seed sustainably, and manage wildfire (TIDE)		62 community members were given training in fire management applicable to savanna or milpa burns (mixed groups of farmers and palmetto harvesters). Numbers trained were: 15 from Bella Vista on 22-23/02/2016, 15 from Bladen on 24-25/02/2016, 8 from Trio on 26-27/02/2015, 11 from Medina Bank on 29/02/2016-01/03/2016 and 13 from San Isidro on 2-3/03/2016. A further >40 community members will receive this 2 day training in year 2 of the project.

		Training regarding sustainable palmetto harvesting will take place in year 3 of the project.
Activity 2.8 Convene meetings between TIDE, FD, Agriculture Dept., NAVCO and DAVCO to agree improvements to governance of rural fire use (TIDE, FD)		Initial meetings to discuss rural fire use held in year 1: 27/08/2015 meeting between TIDE, DAVCO, the Maya Leaders Alliance and local logging concessionaires 28/08/2016 meeting between TIDE, FD and the Agriculture Department 28/01/2016 meeting between TIDE and FD 03/02/2016 meeting between TIDE and Maya Leaders Alliance Further meetings will be convened in years 2 and 3 of the project
OUTPUT 4. (note this is a changed output from the original proposal) The palmetto seed harvest is secured for community members into the future, through a formal agreement with the forest department, and more sustainable harvesting practices.	A report outlining the current palmetto harvesting situation will be produced, and judged a success if it provides adequate information on which to base discussions with the FD regarding the areas to secure in a legal agreement for community members, entire communities or groups of communities.	This output has been revised from the original project proposal following discussions with FD and the Maya Leader's Alliance in year one of the project, which suggest that the concessions originally envisaged may not be the most suitable legal mechanism for securing the palmetto harvest. The indicators are now more suitable and should be achieved by EoP, with community research commencing in year 2 of the project. A request to change this output was submitted in Feb 2016 and agreed by DEFRA in March 2016.
Activity 3.3 Consult with palmetto harvesters to establish the areas that are currently harvested by each community, the numbers of harvesters in each community and to discuss how the harvest could be best secured from the community perspective. (TIDE)		Scheduled for year 2
Activity 2.5 Train and equip ≥50 community members to harvest palmetto seed sustainably, and manage wildfire (TIDE)		See above
Activity 3.4 Convene at least 5 meetings between TIDE, FD and the communities, regarding the most suitable legal agreement for securing the palmetto harvest for community members into the future (TIDE, FD)		Scheduled for year 3
OUTPUT 5. A plan for a sustainable extraction zone in PCNP that includes an evaluation of the ecological and socio-economic impacts.	**7**. The plan will be judged to have been a success if it provides adequate information on which to: a) base sustainable extraction rates; b) cost the implementation of the plan; c) evaluate the monetary and non-monetary benefits; d) evaluate the ecological impacts and plan mitigation measures. No similar study is available at present.	The activities under this output are scheduled for years 2 and 3 or the project, and the indicator is still suitable. The pine distribution data already collected under output 1 will form an important input for the sustainable extraction plan.
Activity 2.6 Assess the economic costs of fire management and incomes from sustainable extraction of woodland resources (TIDE)		Scheduled for year 2

Activity 2.7 Create a plan for a sustainable extraction zone in PCNP, including evaluation of the ecological and socio-economic costs and benefits (TIDE)		Scheduled for year 3
OUTPUT 6. Business plans created for ≥3 additional SFEs suitable for PCNP buffer communities.	**8.** The number of business plans for SFE making use of savanna resources will have increased from none to ≥3. The plans will be judged successful if they provide sufficient information for an investor to decide whether or not to invest.	Much of the activity under this output is scheduled for years 2 and 3 of the project. Consultations held in year 1 suggest that the indicator remains suitable, with community members interested in developing SFEs, and putting forward their initial ideas. In year 2, a member of each community will join TIDE and the project officer to visit a successful community SFE in Guatemala, after which interested community members will be invited to further meetings about SFE development, paving the way for the business plans to be written.
Activity 3.1 Undertake baseline and EoP surveys of livelihoods in five communities (IIED, TIDE)		Community profiles for each of the 5 target communities were undertaken in year 1 and written up as a baseline report. This will provide information, along with other reports, against which the impact of the project may be assessed. The profiles are attached in annex 4.
Activity 3.2 Formalise license agreement(s) with FD terms for community-run SFE to sustainably use woodland resources (TIDE, FD)		Scheduled for years 2 and 3
Activity 3.5 Meetings with community groups to assess interest in developing SFEs (IIED, TIDE)		The idea of SFEs was presented, and community ideas and feedback gathered at meetings on the following dates: 20/03/2016 San Isidro 22/03/2016 Trio 29/03/2016 Bladen 03/04/2016 Medina Bank Further meetings will be held following an exchange with community members in April 2016 to see a successful group SFE in Guatemala.
Activity 3.6 Develop business plans for three SFEs (IIED)		Scheduled for year 2

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.			
Outcome: Biodiversity of pine woodlands in southern Belize is conserved by developing community-based wildfire management, with local communities incentivised to participate through a more just and sustainable use of woodland resources.	**1.**Biodiversity is monitored and conserved **2.**Wildfire is reduced by participation of ≥100 community members in wildfire management **3.**Woodland resources are used sustainably **4.**Local communities obtain livelihood benefits.	**1** Results of plant and animal monitoring surveys in PCNP, Deep River Forest Reserve and Swasey-Bladen Forest Reserve, using protocols developed under the project, will be aggregated and reported annually in documents such as the PCNP annual report to FD. Datasets will be collated by ERI as part of its national biodiversity monitoring and reporting programme. Evidence of numbers of people trained will be verified through completed examination scripts and task books. Biodiversity training materials will be supplied as pdfs for inspection. **2**. Mario Muschamp, in-country lead, chairs the SBFWG and will verify trainee's competency following participation in fire management training. TIDE will contact recipients of training in safe use of agricultural fire, whose names and contact details will be recorded in a database, to verify whether or not they are using the training provided. A sub-set of participants' farms will be visited for further verification. The project officer will carry out a GIS analysis of wildfire in Toledo's pine savannas to estimate the impact of project interventions on wildfire frequency and severity during the project. The full impacts will occur after EoP, and will be measured by future remote sensing studies of fire and land use change that will be carried out by UoE, following methods developed for Belize by themselves and workers such as Cherrington (2010) and Meerman (2011). **3.**	**1.** The Government of Belize remains a committed signatory of the CBD and the Forest Department continues to engage with this project as means of obtaining evidence to support moves towards promoting access and benefit sharing within its forest reserves and national parks, moving the government towards ratifying the Nagoya protocol. This will be monitored through the level of input by FD to project activities, their level of engagement with stakeholder meetings and their attendance and contribution to project partner meetings. This risk has been reduced by involving FD as a co-implementing partner since the inception of the project, so that many FD staff are already aware and supportive of the project ideas, having been involved in shaping them. We will encourage their continued support by actively engaging with a wide range of FD personnel from the Chief Forest Officer down to forest officers, by co-working with them on the resource inventory fieldwork, by involving them in meetings and training events, and by covering their travel costs **2.** Project partners and stakeholders continue to co-operate effectively. This risk is reduced because TIDE already has good working relationships with the 5 communities to be involved and their community leaders were consulted and agreed to the idea of participating in fire management and small forest business development as part of the scoping for this project. We will monitor the level of engagement by the 5 communities in the project; if we find reduced engagement by particular villages, groups or gender, we will respond by pro-

		A report on palmetto palm use and availability will verify whether present harvesting rates are sustainable. Results of the pine stock assessment and plan for a sustainable extraction zone in PCNP will be written up in reports and supplied for inspection, together with written protocols and training materials for forest inventorying. Results of baseline and EoP surveys in the 5 communities will be written up and supplied as reports to verify the social impact of the project on the target communities. Notes from meetings will be assembled into aa report that will summarise outcomes of consultations held between FD, TIDE, local communities and their representatives and the commercial logging concessionaires. This will provide verification of community participation in decision making to establish conditions by which local communities may access and use pine woodland resources (including NTFP) in forest reserves and, in future, national parks. Notes from community consultations on proposals for SFEs and the business plans for three SFE will be available for inspection.	actively seeking further engagement, e.g. by modifying the nature / timing of outreach or training. Stakeholders, including logging concessionaires, local communities and the wider NGO network, will be engaged through regular meetings throughout the project. Partners will be able to review and comment on project management and adjust activities, including frequency, location and timing of meetings, possible additional stakeholders or partners and methods of communication, to facilitate co-operation. **3.** Natural disasters, such as hurricanes or wildfires do not seriously damage the woodland areas in Payne's Creek National Park, Swasey-Bladen Forest Reserve and Deep River Forest Reserve, which are the focus areas for this project. Southern Belize is in a relatively low risk hurricane belt compared with most of the Caribbean. The risk over the 3 years of the project is low. The project itself responds to the risk of intense wildfires by establishing community fire management. As the project progresses, it will reduce the risk of wildfire and build community resilience. By distributing the fire management and community concessions geographically in different savanna areas, the risk that all sites would be affected by a natural disaster is minimised. **4.** There continues to be sufficient demand for palmetto palm seed. This assumption is likely to be valid since there has been a reliable market for 16 years. Mr. Paul Bradley from Burrell Boom, Belize District has been exporting to Canada since 1998. In 2014, he exported 350,000 lb dry seed (583,000 lb wet) and says his buyer would have taken another 50% had it been available. He has expressed that his main problem is harvesters cutting down the trees to obtain the seed. He is very supportive of the plans proposed in this project to train and equip community members to harvest sustainably.
Outputs:	**1.** Measures of abundance, diversity, distribution and/or condition of animals (A.	**1.** Biodiversity baselines for PCNP, DRFR and SBFR will be verified by biodiversity	**1.** Personnel with required expertise for biodiversity / resource monitoring, and design

OUTPUT 1. Biodiversity and woodland resource baselines are established for pine savanna woodlands within Toledo District and monitored during the project to provide evidence that biodiversity is being conserved and in some cases may have been enhanced during the project period.	oratrix and bird indicator species) and plants (P. caribaea, Z. prasina, V. gaumeri, A. wrightii) in PCNP, DRFR and SBFR will be recorded using protocols developed under the project (e.g. roost counts, transect surveys, point surveys, vegetation plots, etc.) for Belize nationally by the ERI and TIDE based on international indicators suggested by UNEP/WCMC, Panthera and WWF. Availability of baseline data for PCNP will have increased from one of these monitoring targets (birds) at present to six by end of project (EoP). Revision of the bird monitoring protocol is required to coordinate with other PA. Baseline data for DRFR and SBFR will have increased from one of these monitoring targets (Caribbean pine) to two (pine and palmetto).	monitoring reports and raw data.	/ provision of training courses remain committed to the project. The assumption is likely to be valid since individuals with the required expertise have already been identified and consulted
OUTPUT 2. Training to enhance national capacity to a) monitor savanna biodiversity / resources; b) provide training in best practices for agricultural fire use; c) develop small forest enterprises	**2.** The number of people in Belize capable of monitoring all of the species under output 1 will have increased by ~30 from <10 at present. The number of people in Belize capable of providing training in safe use of agricultural fire will have increased by ≥15 from <5 currently. The number of persons in NGOs and project communities with an understanding of how to develop SFEs will have increased by ~20 from an estimated <10 at present.	**2.** The number of people with the competencies described will be verified by course instructors and evidenced by completed task books, and certificates of attainment/competency awarded to successful students through the NTPPAM programme.	**2.** NTPPAM and the National Ranger Training Academy continue as long-lasting initiatives. This is realistic as the intention is for them to become self- sustaining in the long term, financed by trainee fees. A business plan has found this to be viable. Belize' Protected Areas Conservation Trust has indicated an intention to fund additional capital costs for these programs on an on-going basis.
OUTPUT 3. (revised from original proposal) ≥100 community members are trained in fire management (≥50 palmetto harvesters trained in fire management for pine savannas and ≥50 farmers trained in best practices in use of agricultural fire)	**3.** The number of community members trained in: a) fire management for pine savannas; and, b) best practices in use of agricultural fire, will have increased by ≥50 each from baselines of 10 and 45, respectively.	**3.** The number of people trained in fire management will be verified by completed task books and records of course attendance.	**3.** Community members remain interested in training in fire management. A pilot training session on agricultural fire best practices in 2014 was very well received – farmers were glad to learn they can achieve their burn objectives (to mineralize the maximum proportion of biomass in the plot) safely without significant extra effort.
OUTPUT 4. **(revised from original proposal)** The palmetto seed harvest is secured for community members into the future, through a formal agreement with the forest	**4.** A report outlining the current palmetto harvesting situation will be produced, and judged to be a success if it provides adequate information on which to base discussions with the FD regarding the areas to secure in a legal agreement for community	**4.** A written report about the present palmetto harvesting situation and minutes of at least 5 meetings between community members, FD and TIDE will provide verification	Palmetto palm resources are not destroyed by hurricane or major wildfire. Wildfire monitoring is built into the project. The market for palmetto palm seed remains viable. This will be monitored through the

department, and more sustainable harvesting practices.	members, entire communities or groups of communities		project. Community members remain interested in harvesting NTFPs and SFEs. This assumption will be monitored through the project using feedback from stakeholder meetings and the results of the reflective learning M&E by the communities.
OUTPUT 5. A plan for a sustainable extraction zone in PCNP that includes an evaluation of the ecological and socio-economic impacts.	**5.** The plan will be judged to have been a success if it provides adequate information on which to: a) base sustainable extraction rates; b) cost the implementation of the plan; c) evaluate the monetary and non-monetary benefits; d) evaluate the ecological impacts and plan mitigation measures. No similar study is available at present.	**5.** The sustainable extraction zone plan will provide verification.	**5.** Agriculture Dept. and other partners remain open to discussing possible changes to governance of rural fire use. Engagement with the Agriculture Department is planned throughout the project, and their level of engagement will be monitored and reported at partner meetings.
OUTPUT 6. Business plans created for ≥3 additional SFEs suitable for PCNP buffer communities.	**6.** The number of business plans for SFE making use of savanna resources will have increased from none to ≥3. The plans will be judged to be successful if they provide sufficient information for an investor to decide whether or not to invest.	**6.** The business plan documents will provide verification.	**6**. FD remains willing to grant licenses for NTFP extraction from forest reserves. This will be reinforced if Belize ratifies the Nagoya Protocol, as is anticipated over the next 5-10 years once sufficient evidence has been assembled for the government from sources such as this project

Activities (each activity is NOT numbered according to the output that it will contribute towards, but after the 3 work packages in the project proposal methodology)

1.1 Surveys of pine stocks in PCNP (TIDE, FD)

1.2 Establish 28 0.2 ha permanent plots in PCNP (TIDE, FD)

1.3 Assess distribution, abundance and productivity of palmetto palm in PCNP, DRFR and SBFR (TIDE, FD)

1.4 Develop protocols for monitoring Caribbean pine and palmetto palm (TIDE)

1.5 Establish/refine protocols for monitoring key conservation targets (yellow headed parrot, the cycad palm Zamia prasina, and the fiddlewood tree) and biodiversity indicator species (birds) in line with the National Biodiversity Monitoring Program (TIDE, ERI)

1.6 Establish biodiversity and wildfire baselines against which effects of fire control and sustainable harvesting will be monitored (TIDE)

1.7 Publish materials for monitoring pine woodland biodiversity and resources as part of the NTPPAM (ERI, TIDE)

1.8 Conduct national training workshops in biodiversity monitoring for ~30 PA staff (ERI)

2.1 Community consultation on wildfire management (TIDE, FD)

2.2 Produce materials to train community members in fire management and disseminate via NTPPAM (TIDE, Everglades)

2.3 Train ≥50 farmers and community leaders in fire management (TIDE, Everglades)

2.4 Train ≥15 PA personnel and community leaders to deliver further training as provided in 2.3 beyond EoP (TIDE, Everglades)

2.5 Train and equip ≥50 community members to harvest palmetto seed sustainably, and manage wildfire (TIDE)

2.6 Assess the economic costs of fire management and incomes from sustainable extraction of woodland resources (TIDE)

2.7 Create a plan for a sustainable extraction zone in PCNP, including evaluation of the ecological and socio-economic costs and benefits (TIDE)

2.8 Convene meetings between TIDE, FD, Agriculture Dept., NAVCO and DAVCO to agree improvements to governance of rural fire use (TIDE, FD)

3.1 Undertake baseline and EoP surveys of livelihoods in five communities (IIED, TIDE)

3.2 Formalise license agreement(s) with FD terms for community-run SFE to sustainably use woodland resources (TIDE, FD)

3.3 Consult with palmetto harvesters to establish the areas that are currently harvested by each community, the numbers of harvesters in each community and to discuss how the harvest could be best secured from the community perspective. (TIDE)

3.4 Convene at least 5 meetings between TIDE, FD and the communities, regarding the most suitable legal agreement for securing the palmetto harvest for community members into the future (TIDE, FD)

3.5 Meetings with community groups to assess interest in developing SFEs (IIED, TIDE)

3.6 Develop business plans for three SFEs (IIED)

3.7 Train ~20 staff from TIDE and other NGO co-managers in SFE development (IIED)

Annex 3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
2	Masters submitting Masters thesis under the project	2 male, 2 female	UK	3			3	4
4A	Postgrad students to receive experience/training	1 Female	UK	1			1	1
4D	Weeks for 4A			2			2	6
6A	Community fire training-basic level for Belizeans	(year 1: 39 male, 23 female)	Belizean	62			62	>100
6B	Community fire training-basic level (2 days with each group of 15 people)		Belizean	2			2	3
6A	PA managers/ community leaders fire training-advanced level		Belizean	0			0	>15
6B	PA managers/ community leaders fire training-advanced level		Belizean	0			0	1
6A	Training to community members to carry out monitoring		Belizean	0			0	6
6B	Training to community members to carry out monitoring		Belizean	1			1	1
6A	Training to national PA managers in biodiversity monitoring		Belizean	0			0	20
6A	Training to NGO staff in SFE development		Belizean	0			0	20
7	Fire training manual			1			1	1
7	Fire use leaflet for communities			1			1	1
9	Harvesting plan			0			0	1
10	Field protocols for monitoring biodiversity (pine, palm, fiddlewood, mammals, parrots & birds.			6			6	6
11A	Papers published in journals		English	0			0	1

20	Palmetto harvesting equipment			0			0	30
22	Permanent plots established			0			0	28
22	Palmetto/ biodiversity monitoring transects			4			4	20
23	Additional resources from other sources	UE contribution for Project Officer travel/subs	£GBP	£5k			£5k	£ 15k
23	Additional resources from other sources	Forest Farm Facility exchange visit for 8 person weeks to Guatemala	£ equivalent	£5k				£ 5k

Table 2 Publications

Title	**Type** (e.g. journals, manual, CDs)	**Detail** (authors, year)	**Gender of Lead Author**	**Nationality of Lead Author**	**Publishers** (name, city)	**Available from** (e.g.website link or publisher)
Mapping the Extent and Distribution of Caribbean Pine in the Lowland Savannas of Southern Belize						
	MSc dissertation	East, A	F	British	University of Edinburgh	Free download
URL:						
Mapping the Extent and Distribution of Palmetto Palm in Three Protected Areas of Southern Belize Using Remote Sensing						
	MSc dissertation	Chambers, J	F	British	University of Edinburgh	Free download
URL: https://www.era.lib.ed.ac.uk/handle/1842/11797						
Analysing the Environmental Niches for Caribbean Pine and Palmetto Palm in the Lowland Savannas of Southern Belize						
	MSc dissertation	O'Keefe, J	M	British	University of Edinburgh	Free download
URL: https://www.era.lib.ed.ac.uk/handle/1842/11802						