Darwin Initiative 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 – Submission deadline 30 April 2007

Darwin Project Information

Project Ref Number	14-025
Project Title	Developing integrated assessment of biodiversity in Belize, Central America
Country(ies)	Belize
UK Contract Holder Institution	CEH
UK Partner Institution(s)	Natural History Museum
Host country Partner Institution(s)	Wildtracks and Belize Audubon Society
Darwin Grant Value	£168291
Start/End dates of Project	01.05.05 to 01.05.08
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 Apr 2006 to 31 Mar 2007
Project Leader Name	Lindsay Maskell
Project website	http://www.ceh.ac.uk/sections/eaf/EAFBiodiversityassessmentinBelize
Author(s), date	Lindsay Maskell 25th April 2007

1. Project Background

This project is located in Belize, Central America. It was developed in response to the recognition of absence of data on the relative biodiversity value of previously impacted forests, and their role and contribution within the national protected areas system. The project arises from a need to coordinate and collate information at larger geographic scales and to take an ecosystem level approach to understand the functioning of communities.

Whilst it builds on past and ongoing experience and studies of the UK and Belize project partners, the application of this experience to address the subject of the project is a new

initiative. It is a collaboration between UK partners; the Centre for Ecology and Hydrology and the Natural History Museum and in Belize the Belize Audubon Society (BAS) which is the largest and leading national conservation NGO; BAS is the principal benefactor in the project, in terms of capacity-building, staffing and infrastructure; Wildtracks a smaller NGO, playing a lead role in national conservation management planning in Belize, coordinates and supervises the project.

2. Project Partnerships

The partnership between the UK lead partner and the coordinating agency in Belize has worked well with project visits and regular communication. The link with the other UK partner the Natural History museum has been slightly different than envisioned but the project has benefited greatly from the expertise of Dr. Sam Bridgewater from NHM.

Within Belize the partnership between Wildtracks and the Belize Audubon Society has been good, with Wildtracks using the structure and support of the Project to help build research capacity within BAS. .

3. Project progress

The project has made good progress this year, building on the infrastructure acquisition, planning and training that was implemented in the first year. The main focus for the second year was collection and collation of data at the three sites as well as continuing to maintain relationships and networks with other interested parties across the country. Data collection field-trips have been managed on a flexible basis in-Country, working around the logistical hurdles of working in three somewhat distant protected areas. This approach has been effective, with data collection being on track and in fact exceeding that originally planned in some avenues of work. The completion of fieldwork is currently planned for late May or early June 2007, allowing time for additional field-visits to address specific questions if the need arises from analysis of the data.

3.1 Progress in carrying out project activities

Review and Planning workshop

This took place the first week in May. A team from the Centre for Ecology and Hydrology visited Belize to review progress and to plan the next stages of the project. Extensive discussion was had regarding sampling design and setup. This led to more detailed field testing to develop protocols for the data collection phase of the project. The field collection for the project will consist of sampling patches of vegetation subjected to different land-uses. Due to the variation in patch shape and size it was decided to use multiple quadrats. Field testing focused on determining the size of individual sub-plots relative to the species accumulation curves for forest patches and outlining which other attributes aside from plant species would be recorded.

As well as method development this exercise also highlighted a number of issues to be dealt with.

Additional methodology planning was conducted in Belize with input from Dr. Sam Bridgewater (Natural History Museum) and from Prof Steven Brewer (University of North Carolina Wilmington), drawing on their experiences characterizing forests in the Maya Mountains of Belize, focussing on the maximisation of sampling efficiency.

Field collection of data

Protocols were established for the vegetation after the field visit in May and for the other species on a similar timescale. This also involved identifying necessary equipment and this was bought and collected. Staff were trained in fieldwork techniques and the intensive field data collection phase began (there had previously been field visits to collect landuse information), experts have been brought in to assist where possible. In particular there had been concern about the lack of botanical expertise both on the project and within the country and a newly graduated MSc student in taxonomy from the Royal Botanical Gardens was brought in to help with botanical collection in Belize and subsequent plant identification. Her costs have been covered by the project from re-allocated money assigned to the sub-contractor. These are very small and her assistance has been invaluable both in the actual botanical collection and identification and in increasing capacity in the rest of the team.

Getting to the stage where data collection can start was an achievement, however, data collection is now well underway, with 94 quadrats completed in the Fireburn Reserve, and a reference collection of tree samples collected. The second series of quadrats is currently underway at the Cockscomb Basin Wildlife Sanctuary, with 39 quadrats completed to date and another extensive specimen collection. The third series at Crooked Tree is underway, with 27 plots to date, and the associated reference collection. The tree sample reference collections for the three study sites will be identified as far as possible at the Forest Department Herbarium in Belize, prior to unidentified specimens being shipped to the UK for further identification. Duplicate collections will be maintained in the Belize Herbarium and at Wildtracks. Digital photo-sheet guides have been developed to assist the extensive field surveys and will be an output from the project.

Prior to the initial analysis of data from the quadrat surveys, trends in species richness, dominance and forest structure are already becoming clear. The team is very confident of successful completion of the integrated assessment of the forest patches, and is already focussing some attention on the identification of potential indicators of overall forest condition.

Bird surveys were conducted at all three of the study areas during December and January. These surveys were conducted by Dr. Lee Jones along with Israel Manzanero Sr. from St. Herman’s Blue Hole.

Database

A database structure has been established and as data is collected it is entered according to standardised recording forms. Data entry, from the completed field data-sheets has been completed with a preliminary analysis planned for May 2007, to allow any fine-tuning of methodology that might be necessary prior to completing the 2007 dry-season survey period, and to identify areas where additional attention might be required.

Training

At the same time as reviewing the project and developing field protocols, participants were trained in experimental design and fieldwork techniques.

The Darwin project team in Belize were trained, by Dr. Bruce Miller of the Wildlife Conservation Society, in the use of the Anabat acoustic System equipment for monitoring bats as part of National Monitoring Pilot Project: Using Bats as Indicators.

Members of the Belize team have been trained by Wildtracks in amphibian survey techniques, and in amphibian identification.

With valued input from Dr. Sam Bridgewater, plant collection, drying, storage and field identification techniques have been passed on to the team, along with an overview of additional methods of sampling large canopy trees. Dr. Elma Kay's involvement (University of Belize) has significantly enhanced the legacy of the project, with the project being the focus of a workshop and training session for 28 UB students in mid-November at Fireburn. This very successful training session was followed in March by a field-training session, by Wildtracks, on field herpetology for 15 UB students.

Field staff of both BAS and Wildtracks, along with undergraduates of the University of Belize, have participated in the fieldwork, receiving on-site training in GPS use, sampling design, botanical plot surveys, avian and herpetological surveys. Additionally, community members from stakeholder communities have participated in portions of the work, gaining skills that can be employed by other researchers.

Networking/links to other projects/activities.

Networking remains a very productive aspect of the project. The Belize Project Coordinator has been active in securing invaluable input from Dr. Bridgewater, and more recently from Prof. Brewer, to help fill the technical capacity gaps in botany in Belize. With Dr. Kay (University of Belize) now involved in the project, this transfer of technical capacity is extending beyond the core team, to include a significant number of University of Belize undergraduates. Ivis Chan, the Project Researcher has further developed this networking ethos – to assist Belize Audubon in securing the input of Dr. Bridgewater to help develop the first broadscale tree species list for Cockscomb (January 2007). Both Sam Bridgewater and Steven Brewer have volunteered to integrate their upcoming research with that of the Darwin Initiative Project, to maximise data acquisition and value. A second post-graduate student of Sam Bridgewater's master's course will be integrating her fieldwork into the Darwin Initiative Project's work in Cockscomb, and will work alongside the team in May 2007. The scope and scale of long-term conservation research benefits likely to result from partnerships between Lindsay Maskell of CEH, Sam Bridgewater (Natural History Museum) and Steven Brewer (University of North Carolina), and with the team of technical expertise now being developed in Belize is encouraging.

Project planning

The Belize co-ordinator visited Britain in March 2007. This was to hold detailed planning meetings with the Centre for Ecology and Hydrology. These meetings were extremely useful: there were detailed discussions of progress and planning both practical and financial for the coming months. Dr. Sam Bridgewater from the Natural History museum also attended on one day and it was very useful to exchange ideas and benefit from his expertise in botanical work in Belize.

3.2 Progress towards Project Outputs

Progress towards project outputs has been good and all projected outputs for this year have been achieved. It is not anticipated that there will be a problem in achieving projected outputs for next year although these are quite ambitious.

3.3 Standard Output Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
Established codes						
6A	Review and planning workshop					
6B	Number of weeks		1			
6A	Training in fieldwork techniques for Darwin project team, workshops and on-the-job training,		15			
6B	Number of weeks		14			
6A	10 people (8 native to Belize, 2 resident for 20 years) received training course in GIS and database management	10				
6B	Number of weeks	1 week				
6A	Training in botany for UB students		28			
6B	Number of weeks		0.5			
6A	Training in herpetological techniques for UB students		15			
6B	Number of weeks		0.2			
8	Number of weeks spent by UK staff	5	5			
12A	Database established		1			
13A	Botanical species		1			

	reference collections **established**					
14B	Attendance at GIS conferences	3 days				
17B	Dissemination network enhanced/extended	1	1			
20	Vehicle, GIS computer,	11 179	1750			
22	Field plots		160			
23	Other funding	15 929				
New -Project specific measures						

Table 2 Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £ (if applicable)

3.4 Progress towards the project purpose and outcomes

Progress towards the project purpose and outcomes has been good, The purpose level assumptions to provide the tools for enhanced biodiversity assessment and gap analysis for more effective conservation planning at the local and ecoregional scale hold true and the indicators are sufficiently detailed to provide useful information on progress towards this target. Data collected under the Project is already being used in conservation management decision-making, with the Belize Audubon Society benefiting from the adoption of a structured scientific approach to some issues.

3.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

The primary route in this direction is through enhanced conservation management, basing biodiversity assessment and conservation planning on reliable on-the-ground data, and allowing adaptive management that effectively draws on increased biodiversity data as it becomes available. The Belize project coordinator notes that the project has allowed good progress at the site-level, and is optimistic that this can be integrated into effective implementation of Belize's National Protected Areas Policy and System Plan.

4. Monitoring, evaluation and lessons

To some extent the project goals for this year were quite straightforward. Having established the infrastructure in the first year; getting personnel and equipment in place, training (although it is an ongoing process), data collection and networking with other interested parties and organisations the second year was able to build on that foundation. The milestones for this year concerned training, planning workshops and data collection so it was easy to monitor whether these had taken place. There was a visit to Belize from CEH staff, regular communication email and phone between CEH and the Belize coordinator Paul Walker and a visit from Paul Walker to the UK. Communication has been good, the recent project planning meeting between Paul Walker and CEH was particularly beneficial.

The Belize coordinator has worked closely with the Project Leader to keep the project on track, he has had more responsibility than originally anticipated as the UK project leader has had a few health problems. Horizontal project management was implemented, resulting in greater partner participation in project direction and management – which is believed to have increased capacity-building beyond the original scope of the project, and which will undoubtedly leave a greater legacy from the project. Other collaborations have been developed that have significantly contributed to the project.

5. Actions taken in response to previous reviews (if applicable)

The comments from the previous review were very favourable, there were a number of points raised for clarification or that would require monitoring and these have been noted and addressed.

It was felt that there should be staff support for the concerns from the project researcher for more guidance on project activities and outputs. There was a more structured programme of activities in this year with the main emphasis being on training and fieldwork. The review workshop in May initiated development of field protocols and future activities. The project leader is aware that the project researcher still has concerns about her role and there may have been conflict arising from bringing in botanical expertise to assist on the project. Recognizing the critical role of the field botanist, the Project Coordinator has relied heavily on her experience and skills, and appreciates that other team members have found it to be a slow process to learn these skills. The main period of field work is nearly over and attempts will be made to improve communication further and clarify goals and outputs for the coming year.

The reviewer requested stronger capacity building on botanical sampling and identification. This was a real concern for the project as without skills in botanical identification field data collection would have been hampered. Botanical expertise were acquired by collaboration with Dr. Sam Bridgewater which involved training of project personnel and bringing in a recent Masters graduate from the Royal Botanic Gardens in Edinburgh. This has been central to the success of the fieldwork, with ongoing training of the Belize team.

The reviewer suggested an increase in the time spent by senior UK project personnel in the country. The review workshop was successful and was the only trip scheduled in the proposal, however, an additional visit was planned but did not take place; instead the Belize project coordinator visited the UK to review the project status, outputs to date, targets and timelines for the final year.

In response to reviewers comments an additional table has been included in the funding to outline other sources of funding. More clarity has been given on salary and overheads.

It was suggested that care should be taken to avoid diluting the scope of the project activities by giving emphasis to networking and dissemination. Although networking and capacity building have continued this year the emphasis has been on data collection and database development. As well as bird and bat surveys, 160 vegetation plots have been recorded which is a major achievement and will contribute to the biodiversity baseline in the country. It should be noted however, that the project successes have been at least in part the results of the

networking activities: without the collaboration with additional botanical experts, the project would not have been able to make the very significant progress it has. The Belize Coordinator recognizes the concern raised by the reviewer in this regard, but is confident that it was the correct path to follow, and that it was given the appropriate emphasis.

6. Other comments on progress not covered elsewhere

The strong partnership between the CEH team and Wildtracks has been instrumental in keeping the project on track and on schedule, despite unforeseen health and inevitable logistical hurdles. Such obstacles have been discussed as they arise, allowing pro-active and re-active decision-making within the project management so as to ensure the adequate forward progress, fulfilment of project objectives and activities. Additional inputs, especially those of Dr. Sam Bridgewater, have been invaluable the successful implementation of the project to date.

7. Sustainability

The extended role of Wildtracks in project management has increased its capacity to implement and manage structured applied conservation research of this nature. Its lead role in several national conservation planning initiatives ensures that the project outputs and data resources are effectively integrated at both the site and national level. The Project Leader and Wildtracks are now in the initial stages of concept development for continuing the partnership and networking established under the project to further strengthen conservation planning in Belize at the landscape scale.

8. Dissemination

Dissemination of project results is obviously not possible at this stage. However there have been a number of activities outlines above under networking which disseminate knowledge and experience to the wider community. Students from the University of Belize have benefited by direct training on botanical and herpetological identification, by involvement of two students more closely through project work and through the interaction with Dr. Elma Kaye a researcher at the university.

Networking has led to extending capacity by linking up to other projects and initiatives so broadening the impact of the work.

9. Project Expenditure- Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

Source of Income	Amount

10. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for ECTF and the Darwin Secretariat to publish the content of this section

The project has built significantly on the infrastructure developed in the first year. Training of project personnel has continued and developed. There has been organised training in bat identification. Botanical identification skills have increased through formal courses and on-the job training and participation in bird surveys ahs also led to skills development.

This training has extended outside of the project team to students from the University of Belize, 28 of which attended botanical training and 15 were educated in herpetological identification techniques.

In addition to all of these capacity building activities the project has carried out a major phase of data collection and now has data from bird and bat surveys and 160 vegetation quadrats as well as a collection of botanical specimens.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2006/07

Project summary	Measurable Indicators	Progress and Achievements April 2006 - March 2007	Actions required/planned for next period
Goal: *To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve* *The conservation of biological diversity,* *The sustainable use of its components, and* *The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources*			*(do not fill not applicable)*
Purpose To provide the tools for enhanced biodiversity assessment and gap analysis for more effective conservation planning at the local and ecoregional scale.	Establishment of database of species and habitat information. Collection of additional data from secondary forest regenerating from two different landuse scenarios. Increased understanding of relationship between landuse and biodiversity shown by results of analyses. Development of indicators of habitat quality and biodiversity conservation value.	The database has been established in association with forms for data collection. Methodologies for data collection were finalised through discussion and a field workshop. Field data collection has taken place,160 vegetation plots have been established at 2 sites, botanical samples collected and a botanical reference collection will be added to the Belize herbarium, plant identification from samples continues, other species bat and bird surveys have taken place,	Vegetation sampling and botanical collection continues and data will be added to the database. Analysis will begin and results will feed back to the current phase of data collection. There will be development of indicators and tools for biodiversity assessment in the coming year.

		The analysis and development of indicators is the next stage although some preliminary observations have been made.	
Output 1. Technical workshop	Host country personnel trained in database and GIS techniques	This workshop took place in the first year. It was carried out for people with a wide range of GIS skills. Hopefully all benefited but it was not necessarily enough to make those more inexperienced fully competent in GIS so although the indicator is correct it could be misleading. Additional skills in-country have been used to increase the GIS capability of the project.	
Activity 1.1 Technical workshop on databases and GIS		Activity completed, report on workshop was included in last years annual report.	
Output 2. Workshops and seminars on integrated assessment and biodiversity	Increased knowledge of distribution and habitat use of various species in Belize	This output is timetabled for the third year.	
Activity 2.1. Workshops and seminars on integrated assessment and biodiversity		Scheduled for this coming year	
Output 3. Database of biotic and abiotic data	Database of biotic and abiotic data	Training in database construction was given in the first year and Data on landuse was collected. This year the database has been developed and forms for vegetation data collection created.	
Activity 3.1 Database establishment and enhancement		Database development has continued so that the database is fully functioning and ready for data analysis to begin.	

Output 4: Recommendations of management	Communication of project objectives and results to stakeholders	Scheduled for Year three
Output 5: Increased understanding of value of secondary forest and its role within the national protected areas system	Increased knowledge of distribution and habitat use of various species in Belize	This process has begun amongst project personnel and beneficiaries of training such as the students from University College Belize. However, the main phase for this is post analysis and with dissemination of results all scheduled for the coming year.

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources			
Purpose To provide the tools for enhanced biodiversity assessment and gap analysis for more effective conservation planning at the local and ecoregional scale.	Establishment of database of species and habitat information. Collection of additional data from secondary forest regenerating from two different landuse scenarios. Increased understanding of relationship between landuse and biodiversity shown by results of analyses. Development of indicators of habitat quality and biodiversity conservation value.	Reports by host and partner countries Field survey reports by partner institutions Scientific papers Field-testing of resulting predictive modelling & data	That data is spatially compatible. That the project is supported by local experts in species identification and historical changes in landuse.
Outputs Technical workshop	Host country personnel trained in database and GIS techniques	Record of workshops and training	Staff to be trained remain in post and committed to the project

Workshops and seminars on integrated assessment and biodiversity Database of biotic and abiotic data Recommendations for management Increased understanding of value of secondary forest and its role within the national protected areas system Reports Scientific papers	At least 10 students from University College Belize and 15 'A' level students from Corozal to be involved in the project over the three years. Communication of project objectives and results to stakeholders Increased knowledge of distribution and habitat use of various species in Belize	Record of student involvement Copy of scientific papers, reports and management recommendations to Darwin Integration of resultant data sets into national and local site conservation planning	That site conservation planners and protected areas managers continue to recognize the need to integrate this data within their work, to enhance biodiversity conservation in Belize

Activities *Workshops and seminars*	*Yr 1: Project planning workshop with project team to establish priorities, methodologies and procedures (5 days); Project and biodiversity information seminar for local communities (1 day at 3 different locations); Technical workshop on databases and GIS (5 days).Yr 2, Yr 3: Research result workshops; Yr 3; Final workshop (5 days); Final project information seminar for local communities (3 days as above);*
Establishment of database	*Yr 1: Establishment of infrastructure for database and GIS. Staff in Belize trained to input data and carry out analyses. Identification of data gaps. Yr 2: Additional data added to database, Yr 3: Database maintained, staff identified to continue to maintain and develop after project lifetime.*
Research programme	*Yr 1: Gaps identified in data available for integrated assessment, collation of biotic and abiotic data from external sources where possible Yrs 2 and 3: Field collection of data, transects and plots established in natural and human regenerated areas; collection of land-use and historical information Yr 3: Integrated assessment of relationship between landuse and biodiversity. Identification of indicators of habitat quality.*
Reports and Management recommendations	*Yr 1: reports of workshops and seminars, summary of achievements in 01 identifying data gaps. Yr 3: Final report including data analyses and management recommendations.*

Annex 3 onwards – supplementary material (optional)

Attached is a draft version of a botanical guide to Melastomataceae created as part of this Darwin project by Zoe Goodwin.

Checklist for submission

	Check
Is the report less than 5MB? If so, please email to Darwin-Projects@ectf-ed.org.uk putting the project number in the Subject line.	
Is your report more than 5MB? If so, please advise Darwin-Projects@ectf-ed.org.uk that the report will be send by post on CD, putting the project number in the Subject line.	
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	
Have you completed the Project Expenditure table?	
Do not include claim forms or communications for Defra with this report.	