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	15/027
Project Title	Baseline tools for management in PN La Amistad (Costa Rica/Panama)
Country(ies)	Costa Rica/Panama
UK Contract Holder Institution	The Natural History Museum, London
UK Partner Institution(s)	
Host country Partner Institution(s)	Insituto Nacional de Biodiversidad (INBio)
Darwin Grant Value	£225,993
Start/End dates of Project	June 30, 2009
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	July 1 2006 to March 31 2007 (9 months), Annual report 1
Project Leader Name	Alex Monro
Project website	na
Author(s), date	Alex Monro, Alexander Rodriguez, Oscar Chacon, Heiner Acevedo, Eduardo Boza, Nelson Zamora. May 9, 2007

1. Project Background

Both Costa Rica and Panama's BAPs place strong emphasis on networks of protected areas and this is also reflected at regional level by the Mesoamerican Biological Corridor and the establishment of PILA as a bi-national park in 1988.

PILA covers 401,000 ha of tropical forest and is the largest nature reserve in Central America and together with a 15 km buffer zone it represents a major biodiversity resource at a regional (ca 20% of the regions species diversity) and global level. This is recognized in its strategic position in the Mesoamerican Biological Corridor and its designation as a UNESCO World Heritage Site. Its cross-frontier position gives it unique potential to improve bioregional planning. The park's buffer zone includes coffee and beef producers and indigenous subsistence farmers. A consequence of the difficulty of the terrain, the park is relatively unexplored and the only substantial scientific explorations deep into the park have been lead by the NHM in the last 5 years (2003, 2004, 2005 and 2006 planned).

In November 2004 a binational workshop of the Autoridad Nacional del Ambiente, Panama (ANAM) and SINAC in association with local experts identified a strategy that would result in unified management of the park and this project builds on this strategy.

2. Project Partnerships

INBio Botanica: MOU signed between NHM Director of Science and INBio Executive Director. Project staff hired and based at INBio. First field trip for ground-truthing and biodiversity data collection undertaken.

INBio Entomología: Angel Solis (Scarab beetles) and Manuel Zumbado (Tacanidae flies, Sphingidae and Saturnidae moths). Sent collecting team on the first ground-truthing / biodiversity inventory field trip.

Escuela de Biología, Universidad de Costa Rica: Federico Bolaños and Eduardo Boza (herpetologists specialising in amphibia). Federico Bolaños a collaborator on National Geographic application; Eduardo Bozaundertook herpetology inventory on the first ground-truthing / biodiversity inventory field trip.

Escuela de Biología, Universidad de Panamá: Student from the University of Panama participated on the first ground-truthing / biodiversity inventory field trip and focussedon collecting mosses.

Autoridad Nacional del Ambiente, Panama (ANAM). Responsible for the management of PILA in Panama. Project mandate from ANAM. Meetings with CBD focal point Dario Luque in May and June 2006. Particiaption of ANAM in all project workshops. Roney Sandamiego of ANAM's GIS unit participated in the first field trip.

Sistema Nacional de Areas de Conservacion, Costa Rica (SINAC). Responsible for the management of PILA in Costa Rica.

Binational Commission for the management of PILA: the project was represented by Heiner Acevedo (one of two GIS specialists employed part-time by the project) at the annual Binational Commission meeting, Chiriquí, Panama, the 29th-30th May 2006; key parties to the Commission represented at the project workshop in August 2006 (David, Panama).

Nature Conservancy Costa Rica: attended the project workshops in August and September 2006 in Panama and Costa Rica.

3. Project progress

3.1 Progress in carrying out project activities

Output: Life-zone map of Costa Rican component of PILA, produced

Project planning workshop, sign project MOUs. MOU signed between NHM and INBIO (see Annex 3) in April 2007. ANAM project mandate signed by ANAM in September 2006 (see Annex 4-1).

map network workshop to agree methodologies for the transformation and mapping of remote censused data and protocol for ground-truthing (verifying) life-zone classes identified. This was held in Costa Rica on September 22, 2006 (see Annex 4-2 for attendees). At this workshop the following was agreed:

i. That the base map for the life-zone map should be produced from the analysis of SPOT satellite data.
ii. That this base map be ground-truthed in the course of seven field-trips as specified in the project proposal.
iii. That biodiversity data should be used to inform life-zone classes through techniques such as krieging.
iv. That if possible biodiversity data on groups of organisms additional to plants should be generated, local taxonomic capacity and project resources permitting. Consortia of Costa Rican and Panamanian scientist were invited to propose the inclusion of their groups and a deadline of November 1 set for the receipt of such proposals.
v. That the project should produce a life-zone map for the whole park and not just the Costa Rican component. [This represents a change in position by the Panamanian partners consulted during the planning of this project].

Develop a consortium of partners and local community representatives capable of updating life-zone map on ground. Contact has been made with the Finca Hartmann (Panama), Finca Gamboa (Costa Rica) and local communities from Buenos Aires and the Cabeca indigenous peoples (Costa Rica). These contacts will be developed in a more formal manner in the 07/08 financial year.

Following activities **not** listed in log-frame:

Selection and ordering of SPOT data. This required the purchase of seven images. This area is one of hair rainfall and cloud cover. Four images taken by the Spot satellite over the previous three years were of acceptable quality (with less than 10% cloud). Three images needed to be commissioned from SPOT requiring a satellite to be programmed. The satellite was programmed from the middle of November to the middle of March and the best quality images were selected. The result is that we have images for the full coverage of the park (see Annex 4-3).

Production of draft life-zone map. Oscar Chacon and Heiner Acevedo produced a draft map based on a single image that was used to underpin the first fieldtrip in February 2007. Following input from Malcolm Penn they are currently working on a revised map of the whole area. The currently agreed protocol for the production of the life-zone map is as follows:

> equalise satellite images → correct for abrupt relief changes → use a normal distributed vegetation index and band combinations 2/3 to determine the number of classes that might be present in the images → use a non-supervised classification as a first attempt to classify the image into the number of classes determined previously → use the detailed field data to perform a supervised classification based on the training areas and other layers of information collected → further refine these classes by overlaying krieged distributions for key-stone species to produce life zone classes.

Ground-truthing of draft life-zone maps. The first joint biodiversity data collection - ground-truthing trip was undertaken between February 15 and March 5, 2007. A provisional ground-truthing methodology was tested in the field. This took the following form:

Line transects of 350 m will be established. Where possible these will follow contours, ridges, river edges etc. Ten sample points will be located along each line transect. The ground-truthing team will aim to establish and make the following observations:

- Coordinates and altitude of plot, position (ridge, slop-orientation, valley bottom)
- canopy tree species
- height of canopy at 10 points (using laser hypsometer)
- range of crown diameters (by eye)
- leaf litter depth: make 10 observations of leaf-litter depth
- photograph of soil
- classification of the forest according to Holdridge and Ecomapas classes (CR and P)
- pictures of plot: ground; through plot (with people indicating both edges), of canopy.

This method is still being evaluated by the project team and it is expected that a compatible but modified method will be tested on the following trip. Sixty-seven GPS positions and 14 ground-truthing transects were undertaken.

Output: Database and species list for keystone species produced (specific activities not listed in log-frame)

Project staff lead by Alexander Rodriguez have compiled a database of over 13,000 plant records of ca 2,500 plant species from INBio, the Natural History Museum, Missouri Botanical Garden and the University of Costa Rica. Those species considered keystone will be identified during the course of the field work. This relational database is currently in File Maker format prior to being migrated to INBio ATTA database that will allow the data to be accessed over the web once the project web-pages are produced in 2008 (see project schedule).

Output: Biological collections of keystone plant species produced

Identification of collections.
Ca. 700 plant collections from PILA have been identified. These have resulted in four new records for Panama: *Chionolaena costaricensis, Senecio phanerandrus, Senecio heterogamus, Westoniella kohkemperi.*

The following activities not listed in log-frame:

Collection of biodiversity data

Following discussion at the September 2006 life-zone map workshop and subsequent to this the following groups of organisms were selected:

Insects: Sphingidae, Saturnidae, Scarabidae, Tacanidae (Manuel Zumbado & Angel Solis, INBio Entomologia)

Amphibia: all families (Eduardo Boza & Federico Bolanos, Universidad de Costa Rica))

Vascular plants: all families of flowering plants and ferns (Alexander Rodriguez, Nelson Zamora, Alex Monro and Flora Mesoamericana specialist group).

The collection of these groups will be undertaken in all future collecting trips. The rationale behind the use of these groups is that there is good taxonomic to support the identification of these groups in Costa Rica. In addition these groups are already the focus of national research programmes with a standardised sampling methodology. This will enable biodiversity data obtained through this project to be compared with datasets from all over Costa Rica and to a lesser extent Panama. In the case of the dung scarabidae beetles, the frequency and density of beetles trapped provides an indication of the diversity and density of the mammal population on whose dung they depend.

One hundred and forty amphibian collections, 1842 insect collections and 1676 vascular plant collections were made along an 18 km transect across the Caribbean part of PILA. All of the amphibian collections have been identified, ca half of the vascular plant collections and Altitudinal variation across the transect was from 2200 to 1000 m.

3.2 Progress towards Project Outputs

Overall progress towards project outputs

Overall, progress has been good. We have tried to involve stake-holders as much as possible in the design of the project and this has resulted in some changes: e.g. the use of GIS staff 1/3 time instead of full-time but for the duration of the project rather than the first calendar year; and the inclusion of amphibian and insect groups in the key organisms studied. The change in GIS staffing has caused some delay to the production of images but with hindsight is a more practical approach. There is clearly also a trade-off between consultation and getting things done and this we have had to balance. One example was the consultation over the selection of key groups of organisms and the planning of the first field trip. This resulted in the delaying of the first fieldtrip from November to February. There have also been some 'teething' issues in the planning and execution of fieldwork at INBio but these have hopefully been resolved. Communication is also difficult with both PIs having a busy schedule of international trips.

Despite these issues we have met all of our key milestones, exceeded some of our outputs and successfully mounted the largest expedition organised by INBio that has resulted in some important amphibian discoveries.

How likely the project is to achieve them by its close.

Very likely.

Measuring output indicators: do output level assumptions still hold true?

Yes. As in any many countries, senior civil service appointments are political (i.e. party political). This creates an element of uncertainty regarding Institutional commitments. We do not however anticipate any changes during the course of this project.

3.3 Standard Output Measures

Table 1 Project Standard Output Measures

Output code	Description	Year 1
8 = 3	Full UK project team to attend planning workshop	2
8 = 2	Malcolm Penn and Alex Monro to participate in life zone map workshop	2
8 = 3	Alex Monro to participate on first ground-truthing trip	4
13A = 1, 13B = 2	Duplicate baseline collection of tree and other indicator species Collections enhanced	13A = 4 13B = 7
14A = 1	Project planning workshop, 10 people, 2 days, 1 report	1
14A = 1	Life zone map network workshop to agree life zone classes and strategy, 12 people, 3 days, 1 report	1
15A = 2, 15C = 1	Press release announcing start of project in UK, Costa Rica and Panama	1
16A = 6, 16B = 30, 16C = 12	Project newsletter produced twice a year and circulated to all participants and interested parties	0
17A = 1	Establishment of life zone map network, 12 people	1
Project specific measure 1	Photographic images of living tree species disseminated (through project web site)	na
Project specific measure 2	Ground-truthing points	67
Project specific measure 3	Plant images databased	ca 6,700
Project specific measure 4	Biodiversity data generated (number of collections)	3,400
Project specific measure 5	New species discovered	4

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

This has been good although communication between PIs could be improved. We have selected groups of key-organisms for which there is good taxonomic capacity and comparative data. In response to Panamanian interest, we would like to undertake field work in the Panamanian sector of PILA in Year 3. To this end we applied to the National Geographic to supplement our field budget. In February 2007 we were invited to submit a stage 2 proposal and this was submitted in March 2007.

***See logframe* (Annex 1)**

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

Over 3,400 new biodiversity records generated. Project biodiversity data will be freely accessible over the web and duplicates distributed to appropriate institutions. We have commissioned satellite data, much of which is the first useable (largely cloud free) for PILA. This data will be used to generate a map that will underpin the binational and sustainable management of PILA. Copies of the data have been made available to ANAM

4. Monitoring, evaluation and lessons

Communication between INBio and the Natural History Museum could be improved. Both PIs travel widely and email communication has not reached its potential in this respect.

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

NA

6. Other comments on progress not covered elsewhere

7. Sustainability

NA

8. Dissemination

Project biodiversity data will be freely accessible over the web and duplicates distributed to appropriate institutions. UK PI has submitted an article for publication in the NHM magazine, Nature First and a press release will be made to the CR and UK media in May 2007 concerning the new species discovered.

9. .

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

The project undertook the largest expedition ever mounted by INBio: 10 scientists, field team of 23. This also represented the most substantial biological exploration of PILA to date.

We have discovered two new species of Salamander, one new species of frog and at least one new species of nettle

We have submitted a $25,000 application to the National Geographic Expedition Committee. If successful this will substantially increase our field work budget..

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

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	Life-zone map of the Costa Rican component of PILA will form the basis of conservation plan. Costa Rican PILA management plan includes a prioritised strategy for life-zones. New knowledge on life-zone and species diversity for PILA. New knowledge on conservation status of key stone species.	Satellite image data purchased, methodology agreed, a draft unsupervised classification undertaken, preliminary ground-truthing undertaken and supervised classification beginning. Project outputs mandated by Binational Commission for the management of PILA and by ANAM. Groups of organisms selected, first field-trip undertaken, over 3,600 collections made. Data on conservation status of ca 100 plant species has been compiled. IUCN guidelines will be used to inform methodology and classification.	Further ground-truthing, revised supervised classification to be undertaken, begin krieging biodiversity data. Present preliminary findings at next Binational Commission meeting, incorporate feedback. Present preliminary findings at next Binational Commission meeting, incorporate feedback. This will be ongoing.
Output 1. Life-zone map of Costa Rican component of PILA, produced	Map in use by park authorities; compatible with that for Panama side, all life-zones ground-truthed	NA	NA
Activity 1.1 Workshops/ training	**Yr 1**: Project planning workshop, sign project MOUs (1 wk, July.06).	Two workshops in August and September 2006 were undertaken.	Project will be represented at subsequent Binational Commission Meetings as and

	Yr 1: planning workshop to agree methodologies for the transformation and mapping of remote censused data and protocol for ground-truthing (verifying) life-zone classes identified. (July 2006).	The first was undertaken in David, Panama. The aim of this workshop was to present the project to the institutions party to the Binational Commission for the management of PILA. The result of this was to recieve formal approval and a mandate from the lead Panamanian Institution (ANAM) to undertake the project activities. The second workshop was undertaken in Santo Domingo de Heredia, Costa Rica. The aim of this workshop was to obtain broad agreement from the partner institutions on a timetable for work, the approach to be used to ground-truthing and broad methods for data interpretation. This included the protocol for fieldwork	when they are scheduled.

Activity 1.2. Production and ground-truthing of life-zone map	Collate information from previous studies that have included PILA.	Information was used to interpret unsupervised classification and ground-truthing data.	Completed
	Collate and compare different methodologies for the classification of satellite images.	Methodologies collated and methodology selected.	Completed
	September 2006 Mapping network workshop.	September 2006 Mapping network workshop undertaken.	Mapping network workshop planned for August / September 2007
	Image processing methodology designed and completed by December 2006.	Completed. .	At least two supervised classification to be completed. Krieging of biodiversity data to begin.
	Park limit as decreed in respective Costa Rican and Panamanian legislation has been identified. This has used to delimit the park for the purposes of this projet.	Completed.	
	Identify sources for satellite data.	Completed.	
	Data source, band number and resolution decided (SPOT, four bands, 10 x 10 m).	Completed.	
	Selected images required. Where possible form archive images (2003 and 2006). Commissioned the programming of the SPOT satellite to obtain the remaining four images. Images selected.	Completed.	
	Unsupervised classificaion of vegetation produced.	Completed.	
	First ground-truthing field-trip undertaken.	Completed. Additional ground-truth data obtained following ground-truthing undertaken for a different project to this aimed at mapping the vegetation for Costa Rica. Data was obtained for the Cerro Pittier and Cabecar areas of PILA. A further three ground-truthing trips planned for the coming year.	Ongoing.

Output 2. Life-zones prioritised	Priorities inform park conservation strategy. Deposited with INBio, SINAC and ANAM	NA	Criteria for prioritisation to be discussed and agreed at next Map network workshop.
Activity 2.1. Identification of regionally important and threatened life-zones		NA	
Output 3. Database and species list for keystone species produced	Deposited with INBio, SINAC, ANAM and the University of Panama	Relational data base structure agreed, management of data and its availability over the web agreed with INBio Bioinformatics group.	Data acquisition and entry ongoing.

Activity 3.1 Design and production of database	Database of endemic species (CR, P, CR-P, Cordillera de Talamanca) designed	Existing information on species distribution from ATTA, the National Museum of Costa Rica and TROPICOS. 4143 species records incorporated.	Species endemic to PILA identified from within this list.
	Natural History database (uses, ecology) designed	Natural History data for 50 PILA species (mainly medicinal) entered.	Natural History data for PILA species collected during 2006/2007 and first two 200732008 fieldtrips entered.
	Native / Exotic database designed	Majority of existing data on Exotic species to Costa Rica and Panama entered. This represents 1294 species records.	Those species introduced to PILA identified.
	PILA global distribution (for Lifezone prioritsiation) designed.	Global distribution of 100 species entered.	Global distribution for PILA species collected during 2006/2007 and first two 200732008 fieldtrips entered.
	PILA species records database designed.	Plant records for PILA from INBio, TROPICIS, National Museum of Costa Rica and BM complied and entered. This represents 13 784 collection records representing ca 2 500 species.	Data to be cleaned. Records from The University of Panama, Smithsonian-STRI and the University of San Jose to be included.
Activity 3.2 Identification of collections from PILA	Identification of collections	Ca 700 collections identified. 100 of these new records for PILA. Seven of these new records for the Flora of Panama.	Ongoing.

Activity 3.3 Accession of collections from PILA	Curation and mounting of collections (INBio)	Ca 700 collections mounted and accessioned.	Ongoing.
Activity 3.4 Generation of biodiversity data for PILA	Field trip	First ground-truthing and field data collection trip undertaken in Feb.-Mar. 2007. This involved 22 days camping, ten scientists (botanists, herpetologist, entomologist, GIS specialists) and 13 field assistants. A transect of 18 km, running from the division of the Pacific-Caribbean to the Caribbean extremity of the PILA was undertaken over an altitudinal range of 2200 to 1000 m. .	Second, third and fourth field trips to be planned and undertaken. For each group the same groups of organisms to be surveyed.
	Plant biodiversity data	1652 specimens collected, where possible five duplicates of each specimen were made.	Collections to be identified and databased.
	Plant images	Ca 1800 images of live plants (associated with collections) were made.	Images to be databased.
	Insect biodiversity data	1842 insect collections were made. Three 400 m (each of 80 traps for four days) undertaken and 7 light traps nights undertaken.	Collections to be identified and databased. Pitfall trap data to be compared to national level survey data.
	Amphibian biodiversity data	141 collections were made. This included 27 species, three of which are new to science and probable endemics.	Begin publication of new species descriptions.

Output 4. List of indicator species produced. Keystone species conservation status assessed.	Included in database.	.	
Activity 4.2. Assess conservation status of key stone species		Have begun to define how conservation status to be related to distribution data for species. Information on all of the threatened plant species for Costa Rica and Panama registered on the IUCN red-data list compiled. This has resulted in a list of 451 species.	Final methodology for the classification of conservation status to be established. Those species listed by IUCN that are recorded from PILA to be identified.
Output 5. Staff at SINAC trained in use and updating of life-zone map.	12 staff trained in the delimitation, use and updating/ modification of life zones	NA	
Output 6. Park guards, local community representatives, staff at ANAM and SINAC trained in use of life-zone map.	16 staff trained in the ground-truthing of life-zones	NA	First training course to be undertaken.
Output 7. Mechanism for updating and maintaining life-zone map developed	A binational network in place undertaking coordinated and joint monitoring activities	Project represented at 2006 Commission meeting.	Project to be represented at 2007 Commission meeting.
Activity 7.1. Workshops/ training	NA		
Activity 7.2. Develop a network of ANAM/ SINAC staff to maintain and update life-zone map as part of the PILA management plan	NA. This will follow-on from training.		Participants for first training course to be identified.
Output 8. Biological collections of keystone plant species produced.	Collections deposited at INBio, University of Panama, and NHM	See 'Generation of biodiversity data activity' (3.4). Keystone species to be recognised as such at the end of the ground-truthing and data collection.	See 'Generation of biodiversity data activity' (3.4). Keystone species to be recognised as such at the end of the ground-truthing and data collection.

Activity 8.1. Pursue project exit strategy	Develop a consortium of partners and local community representatives capable of updating life-zone map on ground. Confirm a commitment to periodic updating from SINAC and ANAM. Agree a timetable and strategy for the development of the binational management plan.	The Binational Commission will play a central role in the project's exit strategy and it is through this that the strategy will function at governmental level. At a local community level we have developed and or maintained contacts with some of the local communities surrounding the Park in Panama and Costa Rica. These include local farmers (Finca Hartmann, Finca Gamboa) and indigenous peoples (Suredka Bri Bri, Cabeca)	We will contact more indigenous groups and formally contact the community / village associations of those communities that surround PILA.
Output 9. Local perception of life-zones and their importance	Perceptions incorporated into life-zone priorities	NA	Discussions to be held with tribal and community leaders.

NB. Activities in *italics* not listed as 'Activities' in original logframe (Annex 2)

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 □ı 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			
	Life-zone map of the Costa Rican component of PILA will form the basis of conservation plan.	Life-zone map produced and forms the basis for the Park's management plan.	Sustainable management of PILA will require the prioritisation of activities.
	Costa Rican PILA management plan includes a prioritised strategy for life-zones.	PILA life-zones prioritised and characterized in PILA management plan.	Prioritisation will be based on sound scientific data.
	New knowledge on life-zone and species diversity for PILA.	Species and life-zone list for trees of PILA deposited with SINAC and ANAM, published locally.	Monitoring and assessment of La Amistad life-zones requires a base line map.
	New knowledge on conservation status of key stone species.	Conservation status of keystone species evaluated, assessment used in characterisation of life-zones.	Monitoring and assessment of biodiversity will remain a key component of Costa Rica's BAP.
Outputs Life-zone map of Costa Rican component of PILA, produced.	Map in use by park authorities; compatible with that for Panama side, all life-zones ground-truthed	Map published and cited in conservation plan; project reports	INBio and NHM continue to maintain GIS/ remote sensing facilities.
Life-zones prioritised.	Priorities inform park conservation strategy Deposited with INBio, SINAC and ANAM.	Included in SINAC and project reports. Cited in SINAC, INBio, project reports.	Baseline life-zone map needs to be ground truthed.
Database and species list for keystone species produced.	Deposited with INBio, SINAC, ANAM and the University of Panama.	Cited in SINAC, INBio and ANAM project reports.	Local taxonomic capacity continues to support identification of keystone and indicator species.
List of indicator species produced. Keystone species conservation status assessed.	Included in database.	Deposited with INBio, SINAC and ANAM.	SINAC and ANAM remain responsible for management of PILA.
Staff at SINAC trained in use and updating of life-zone map.	12 staff trained in the delimitation, use and updating/ modification of life zones.	Staff listed in project reports.	SINAC and ANAM remain responsible for management of PILA. Staff gain appropriate knowledge from the training.
Park guards, local community representatives, staff at ANAM and SINAC trained in use of life-zone map.	16 staff trained in the ground-truthing of life-zones.	Staff listed in project reports.	Staff gain appropriate knowledge from the training.

Mechanism for updating and maintaining life-zone map developed.	A binational network in place undertaking coordinated and joint monitoring activities	PILA management plan, SINAC, ANAM, project reports	Mechanism is used and maintained by project partners.
Biological collections of keystone plant species produced.	Collections deposited at INBio, University of Panama, and NHM.	Acknowledged by partner institutions.	Project partners maintain collections.
Local perception of life-zones and their importance	Perceptions incorporated into life-zone priorities.	Acknowledged in reports and map.	Local communities have good knowledge of the buffer zone.
Activities Workshops/ training	Activity Milestones **Yr 1**: Project planning workshop, sign project MOUs (1 wk, July.06).		Assumptions Project partners continue to agree on role and function of life-zone map.
Production and ground-truthing of life-zone map.	**Yr 1**: planning workshop to agree methodologies for the transformation and mapping of remote censused data and protocol for ground-truthing (verifying) life-zone classes identified. (July 2006). **Yr 2**: Life zone network workshop (3 days, Aug. 2007), production of a baseline map. **Yr 3**: Life zone network workshop (3 days, Mar. 2009), training course for ANAM and SINAC staff in the use and updating of the life-zone map (Apr. 2009)		Zonation of the park remains a prerequisite for an effective management plan. NHM and INBio specialist GIS / vegetation mapping staff agree on data transformation methodologies.
Develop a network of ANAM/ SINAC staff to maintain and update life-zone map as part of the PILA management plan	**Yr 2**: field course in ground-truthing and life-zone verification (Dec. 2007), field course in ground-truthing and life-zone verification (Apr. 2008). **Yr 3**: life zone map use and interpretation training course (Apr. 2009).		ANAM and SINAC release staff for training.
Identification of regionally important and threatened life-zones.	**Yr 2-3**: Assess conservation status of life-zones at global, regional and national level. Prioritise life-zones according to these criteria, submit this to SINAC and ANAM.		Regionally agreed life-zones for Central America (based on the Holdridge system) remain current.
Identification of keystone species.	**Yr 1-3**: Identification of collections with partner institutions and *Flora Mesoamericana* network of specialists (Apr. 2008- Dec 2008)		INBio/ University of Panama and NHM remain taxonomic centres of excellence.
Assess conservation status of key stone species.	**Yr 2-3**: Assess according to revised IUCN Red Data list guidelines and local knowledge of local specialists at INBio, PMA and NHM.		Revised IUCN guidelines remain current.
Pursue project exit strategy	**Yr 1-3**: Develop a consortium of partners and local community representatives capable of updating life-zone map on ground. Confirm a commitment to periodic updating from SINAC and ANAM. Agree a timetable and strategy for the development of the binational management plan.		

Annex 3 *MOU between NHM and INBio*

CARTA DE ENTENDIMIENTO ENTRE LA ASOCIACIÓN INSTITUTO NACIONAL DE BIODIVERSIDAD (INBIO) Y MUSEO DE HISTORIA NATURAL (BRITISH MUSEUM) PARA LA EJECUCIÓN DEL PROYECTO: HERRAMIENTAS BASICAS PARA EL MANEJO DEL PN LA AMISTAD, COSTA RICA/PANAMA**.**

Entre nosotros, el Instituto Nacional de Biodiversidad ("INBio"), representado en este acto por el Dr. Alfio Piva Mesén, mayor, casado, Catedrático, portador de la cédula de identidad número uno - dos ochenta y cuatro – cuatrocientos uno; actuando en mi condición de Director Ejecutivo, con la representación judicial y con facultades suficientes para este acto y en adelante denominado el INBio, cédula Jurídica tres-cero cero doscientos tres mil doscientos sesenta y uno-doce, personería que consta en el Registro Público, Sección de Asociaciones, al expediente número tres mil trescientos seis y el Museo de Historia Natural de Londres, Inglaterra, SW7 5BD, U.K., representado en este acto por el Profesor Richard Lane, Director de Ciencia, en adelante denominado NHM, convienen en celebrar la presente Carta de Entendimiento que se regirá por los siguientes antecedentes y cláusulas.

CONSIDERANDO

Que en el pasado se firmó una declaración de intenciones colaborativa entre el Museo de Historia Natural de Londres y el INBio estableciendo el mismo la oportunidad de colaboración entre ambas instituciones para la realización conjunta del Inventario Nacional de Biodiversidad en el Sistema Nacional de Áreas de Conservación de Costa Rica (SINAC), mediante la ejecución de proyectos acordes con los procedimientos y reglamentaciones previstas para tal efecto.

El INBio ha establecido una relación de trabajo con el Museo de Historia Natural de Londres para el desarrollo de proyectos conjuntos en el área de investigación botánica, aprovechando las oportunidades de financiamiento que ofrece la Iniciativa Darwin, lo cual incluyó la realización del proyecto "Desarrollando capacidades en conservación de biodiversidad en Nicaragua y Costa Rica".

Que en fecha 01 de junio del 2006, la Iniciativa Darwin aprobó el desarrollo de un nuevo proyecto denominado "Herramientas de línea base para el manejo del Parque Internacional La Amistad (Costa Rica/Panamá).

Que en el marco del convenio suscrito por los Gobiernos de la República de Panamá y de Costa Rica sobre la Cooperación para el Desarrollo Fronterizo firmado en la ciudad de Sixaola el 3 de mayo de 1992, ratificado por Ley No. 7518 publicada en La Gaceta del 24 de setiembre de 1995 se establece una Comisión Técnica Binacional para el Manejo del Parque Internacional La Amistad (PILA).

Que en fecha 14 de setiembre del 2006, la Autoridad Nacional del Ambiente (ANAM) propiamente el departamento de Manejo de Áreas Protegidas otorga el aval para la ejecución de las actividades del proyecto denominado "Herramientas de línea base para el manejo del Parque Internacional La Amistad (Costa Rica/Panamá).

ACORDAMOS

Elaborar la presente carta de entendimiento que se regirá por las siguientes cláusulas:

PRIMERA: El NHM y el INBio definirán en forma conjunta los alcances de la investigación de línea base a desarrollar en el marco del proyecto antes citado, en lo correspondiente al componente binacional del mismo.

SEGUNDA Establecer una instancia de coordinación y comunicación a fin de asegurar el logro de los objetivos propuestos y la debida internalización del conocimiento científico generado aplicable al manejo del PILA.

TERCERA: El NHM será responsable de desembolsar los fondos del proyecto, por medio de solicitudes financieras trimestrales (véase el anexo A), sometiendo informes semestrales y anuales (en octubre y abril de cada

año) y sometiendo el informe final. El NHM también negociará cualquier cambio (presupuestario y/o técnico) que necesite ser realizado con el proyecto con la Iniciativa de Darwin en Londres.
CUARTA: INBio será responsable de las actividades co-coordinación técnica y el aporte del personal (vía contratación) para la ejecución de las actividades descritas en el Proyecto (véase anexo B).
QUINTA: El NHM realizará las transferencias al INBio basado en una proyección de gastos estimada, además el INBio deberá enviar las facturas en el formato precisado en la forma del Anexo A. Estas formas se deben enviar por el correo aéreo vía DHL, FEDEC, etc. para la señora Julia Gray del departamento de la botánica, NHM en Londres SW7 5BD, Reino Unido. Las sumas remitidas en el establecimiento de estas facturas serán utilizadas solamente para pagar gastos en las tareas establecidas en el proyecto. INBio también someterá una declaración de los gastos efectivos incurridos al NHM al final de cada período de seis meses. Cualquier pago excesivo será deducido de la factura subsecuente.
SEXTA: INBio proporcionará los informes al NHM en el formato establecido, que permita al NHM hacer los informes apropiados al DEFRA.
SEPTIMA: El INBio y el NHM se asegurarán de aplicar una política de oportunidades iguales a todos los participantes en el proyecto, así como patronos, voluntarios y como facilitadores de servicios, sin importar la raza, el sexo, la religión o, en cuanto es practicable, cualquier inhabilidad.
OCTAVA: Uso de los resultados: INBio y NHM harán todas las peticiones pertinentes relativas a derechos, diseño, patentes, y otros derechos de propiedad intelectual, y asegurará este derecho para llevar a cabo el proyecto. Si de los productos que genere el proyecto se desarrolle un aspecto innovativo de trabajo o bien genera cualquier innovación o descubrimiento, estos serán propiedad de las instituciones ejecutoras del Proyecto, siendo este la organización o cualquier otro cuerpo que participó en el proyecto, pero todos los instituciones cuerpos participantes, a parte de las instituciones ejecutoras del Proyecto, no tendrán exclusividad de una licencia amplia-mundial en relación a todas las innovaciones y descubrimientos y todos los derechos de propiedad intelectual asegurados para ello. Los beneficios obtenidos por el cuerpo de origen y otros cuerpos con licencia bajo estas condiciones, serán compartidos entre ambas partes sobre una base justa y de equidad aprobada por el Departamento de acuerdo con la Convención sobre Diversidad Biológica (CBD, por sus siglas en inglés).
NÓVENA: En toda publicación que se genere a partir del proyecto se deberá expresar su reconocimiento al NHM, INBio, SINAC, ANAM y el Reino Unido DEFRA y que el proyecto es un proyecto de la iniciativa de Darwin, además las instituciones involucradas en la ejecución del proyecto, tendrán libre acceso a la información generada en el mismo.
DÉCIMA: INBio y el NHM, juntos ayudarán a proporcionar datos biológicos básicos y los recursos necesarios para apoyar un plan de conservación sostenible del Parque Internacional la Amistad PILA.
DÉCIMA PRIMERA: INBio será responsable de cumplir con los trámites de permisos correspondientes para el desarrollo de la investigación según lo establecido en la normativa vigente, así como también de mantener la relación técnica con MNH de Londres y el donante, a fin de mantener el proyecto dentro de los alcances definidos en forma conjunta.
DÉCIMA SEGUNDA: INBio y el NHM, mantendrán los principios de la convención sobre la diversidad biológica (CBD) en su trabajo sobre la conservación y el uso sostenible de la biodiversidad, y de un compartir justo y equitativo de las ventajas que se presentan de dicho proyecto.

Vigencia:

Esta carta de entendimiento podrá ser modificada de común acuerdo en cualquier tiempo y tendrá una vigencia de tres años. Se entenderá prorrogada por períodos iguales y sucesivos si ninguna de las partes notifica a la otra por escrito su propósito de no hacerlo, con al menos tres meses de anticipación al vencimiento del período que corresponda. Si existiere a esa fecha algún proyecto en ejecución, la terminación de la cooperación no lo perjudicará, las partes de entendimiento tendrán sus propios plazos de vencimiento.
En fe de lo anterior, firmamos en las instalaciones del INBio, el día de del dos mil siete.

Professor Richard Lane
Director of Science
Museo de Historia Natural
Londres, UK

Dr. Alfio Piva M.
Director General
INBio,
Costa Rica

Annex 4-1*: Mandate from ANAM to the project through the Binational Commission for the maangement of La Amistad National Park*

autoridad nacional del ambiente

DIRECCION DE ÁREAS PROTEGIDAS Y VIDA SILVESTRE

MEMORANDO
DAPVS-1241-06

PARA : Licda. Zoila Aquino, Directora de Cooperación Internacional
Licda. Diana Laguna, Directora de Información Ambiental
Ing. Ibelice Añino, Jefa de Vida Silvestre y Biodiversidad
Licdo. Roberto De La Cruz, Director de Planificación
Leonel Quiróz, Jefe del Parque Internacional La Amistad

autoridad nacional del ambiente
Dirección Nacional de Áreas Protegidas y Vida Silvestre

DE : YARIELA HIDALGO
Directora Encargada

ASUNTO : Consideraciones con referencia al Proyecto con el [illegible] Costa Rica, Fundación Iniciativa Darwin.

FECHA : 14 de septiembre de 2006

Por este medio, tengo a bien informar de las consideraciones que fueron tomadas en reunión interna del Departamento de Manejo de Áreas Protegidas, en referencia al Proyecto "Herramientas para el manejo conjunto del Parque Internacional La Amistad Costa Rica-Panama" coordinado por INBio Costa Rica y el Museo de Historia Natural de Londres, con fondos de Iniciativa Darwin.

- Para el desarrollo de las actividades de campo, a través de inventarios que se pretende realizar, tanto de vegetación como de especies de fauna en general, estimamos oportuna y valiosa la participación de los especialistas panameños.
- Estamos interesados en que los especimenes que serán colectados en el territorio panameño, sean depositados en las Colecciones de Panamá (tales como Herbario de la Universidad de Panamá, Museo de Vertebrados, Museo de Invertebrados, y la Colección Programa de Maestría en Entomología de la Universidad de Panamá).

.../...

"CONSERVACION PARA EL DESARROLLO SOSTENIBLE"

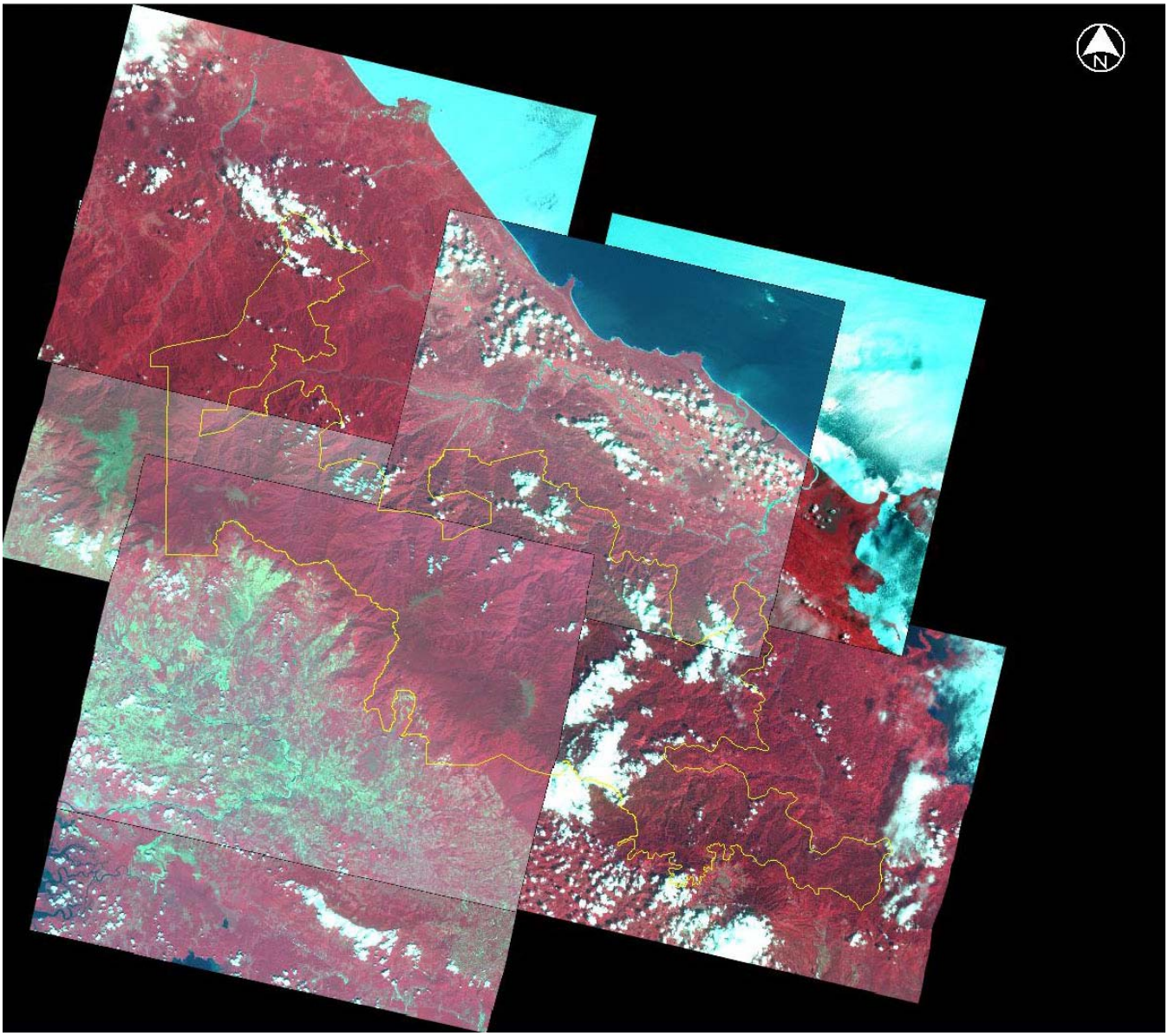
Annex 4.2 Attendees to September 22 project planning workshop.

Nombre	Especialidad	Organización	
Nelson Zamora	Coordinador-Botánico	INBio	
Alexander Rodríguez	Botánico	INBio	
Daniel Solano	Técnico-Botánico	INBio	
Daniel Santamaría	Técnico-Botánico	INBio	
Heiner Acevedo	Coordinador -SIG	INBio	
Sandra Alfaro	Especialista SIG	INBio	
Vilma Obando	Vertebrados	INBio	
Manuel Zumbado	Coordin. Artrópodos	INBio	
Jesuús Ugalde	Director Monitoreo	INBio	
Randall García	Director Conservación	INBio	
Milagro Mata	Coord. Hongos	INBio	
Armando Estrada	Coordinador Historia Natural	Museo Nacional de Costa Rica	
Earl Junier	Coordinador Investig	SINAC, CARIBE	
Nelson Elizondo	Administrador Parque Internacion La Amistad	SINAC	
Adrián Arias	Coord. Investig. ACLA-P	SINAC	
Jenny Asch	Areas Protegidas	SINAC	
Jan Schipper	Mamíferos	CATIE	
José González	Mamíferos	CATIE	
Jaime García M.	Director, Biodiversidad y Especies	Conservación Internacional	
Rosa Bustillo	coordinadora	Corredor Biológico Baja Talamanca	
Vicki Baxter	Cónsul	Embajada Británica, Costa Rica	
Bernal Herrera	Director Científico	TNC-Costa Rica	
Felipe Carazo	Encargado Sitio PILA	TNC-Costa Rica	
Federico Bolaños	Anfibios	UCR	
Gerardo Cháves	Reptiles	UCR	
Gilberth Barrantes	Aves	UCR	
Dra. Grethel Aguilar	Directora	UICN	
Eduardo Carrillo	Mamíferos	UNA	
Alejandro de Sedas	Herbario	Dept. Biología, Univ. Panamá	
Darío Luque		Oficial de Enlace y facilitador del Departamento de Vida Silvestre	
Leonel Quiróz		Jefe Parq. Intern. La Amistad Chiriquí	

Dr. Rafael Samudio		ANAM	
Lic. José Polanco		ANAM	
Dr. Héctor Barrios		ANAM	
Alex Monro		NHM	
Malcolm Penn		NHM	

Annex 4.3. Spot data coverage purchased for La Amistad National Park

Legal border of PILA superimposed (yellow)



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