

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	14-014
Project Title	Conservation of the Bornean elephant (<i>Elephas maximus borneensis</i>)
Country(ies)	Sabah, Malaysia
UK Contract Holder Institution	Cardiff University
UK Partner Institution(s)	HUTAN
Host country Partner Institution(s)	Sabah Wildlife Department, Universiti Malaysia Sabah, WWF-Malaysia
Darwin Grant Value	£239,997
Start/End dates of Project	1 st of July 2005 – 30 June 2008
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 April 2006 to 31 March 2007 Annual report no 2
Project Leader Name	Michael W. Bruford
Project website	none
Author(s), date	Michael W. Bruford (PL), Marc Ancrenaz (PP) & Benoît Goossens (PDRA), 30 April 2007

1. Project Background

The project is located in Sabah, Malaysia, on the island of Borneo. The need for this project was identified by the wildlife authorities in Sabah during a previous DI grant (09-016) and was the result of a common requirement to implement the CBD in Sabah.

The Asian elephant is protected and is classified as endangered under Sabah legislation. The Bornean elephant sub-species has recently been confirmed as a separate taxon, dramatically increasing its importance in terms of biodiversity. In a recent general survey, the Sabah Wildlife Department (SWD) and WWF-Malaysia estimated that about 1,100-1,500 elephants survive in Borneo. They showed that the remnant populations were mainly found in eastern Sabah, and were highly fragmented. The Bornean elephant is therefore the world's most endangered

Proboscis, highlighting the urgent need to undertake sound conservation action in the near future. SWD has recently produced a first draft of the State Action Plan for elephants. Following explicit recommendations of this State Action Plan, our work will provide information that is currently lacking, including the distribution and movement of individuals, genetic differentiation between populations, threats to genetic diversity, identification of priority areas for the species that should be kept under forest cover to allow movements of individuals between the different sub-populations and the genetic identification of persistent crop-raiding individuals.

2. Project Partnerships

Three local partners worked on project activities together in collaboration with PDRA: HUTAN, Sabah Wildlife Department and Universiti Malaysia Sabah. Their relationships during the second year of the project were extremely good. Although WWF-Malaysia withdrew their participation during the first year of the project (see first year report, section 4), efforts have been made by PDRA to restore partnership and we are hopeful that we will be able to re-establish good working relationship (see below). A new partnership has been also developed with the Sabah Forestry Department:

1. HUTAN: Collaboration with the directors of HUTAN, Marc Ancrenaz and Isabelle Lackman-Ancrenaz were, as usual, excellent. The PDRA and Rosdi Sakong, the ex-head of the Elephant Conservation Unit (ECU) in the Kinabatangan, conducted field expeditions in the state of Sabah between October 2006 and March 2007. Field expeditions have been planned together with Marc Ancrenaz. Marc Ancrenaz and the PDRA organised the second wildlife monitoring training course in March 2007. Several (five) field assistants from HUTAN attended the course.
2. Sabah Wildlife Department: Patrick Andau (Director) and Laurentius Ambu (Deputy Director) were very supportive and gave all the authorisations required to sample in the LKWS and in the whole State of Sabah. The PDRA and Marc Ancrenaz are still liaising with PA and LA on the Kinabatangan Elephant Population Management Plan, and we are hopeful that the plan will be available at the end of the project and will include our genetic data.
3. Universiti Malaysia Sabah: UMS (and ITBC) provided the PDRA with an office and internet access. The PDRA used the laboratory facilities at ITBC to perform DNA extractions, DNA amplifications and DNA genotyping. One UMS student is working full-time on the project and registered for a Master's degree in October 2006. Efforts were made by the PDRA to strengthen the capacity of the UMS partner (ITBC) to secure further funds for additional work. A grant application has been submitted to US Fish and Wildlife Service in November 2006. So far, our proposal has received a favourable technical review from the Asian Elephant Conservation Fund proposal review committee. We are waiting for a final decision. Two grants have been obtained to carry out elephant monitoring in the Kinabatangan Wildlife Sanctuary and carry out a behavioural study on the social system of the Bornean elephant in the Kinabatangan (Disney Wildlife Conservation Fund: \$5,000; Columbus Zoo and Aquarium Conservation Fund: \$10,000).
4. WWF-Malaysia: As mentioned above, efforts have been made to restore working relationship with WWF-Malaysia. This includes a meeting with WWF and SWD involving the PL during his last visit to Sabah in September 2006. The Program Officer (Mr Raymond Alfred) of the Sabah Orang-utan, Elephant and Rhinoceros Landscape (SOREL) project was invited to attend our training course in March 2007 and we took the opportunity to discuss about re-establishing our collaboration, particularly in terms of dung collection in the state of Sabah. WWF-Malaysia is currently radio-tracking several elephants in the region. A meeting was scheduled for April 19, 2007, with Dr Arun

Ventakaraman, National Programme Director for WWF-Malaysia. A Memorandum of Agreement has been drafted and will be signed by all parties (WWF, Cardiff University, UMS and HUTAN) in May 2007. We agreed to work together in order to: (1) Establish a model from DNA (dung sampling) analysis to be used in estimating the minimum number of elephants in Sabah (Borneo); (2) Study the habitat use and feeding behaviour by elephants in Sabah based on the satellite tracking activities to support the population estimation mentioned in (1); (3) Provide genetic information on Bornean elephant populations in Sabah; (4) Map important habitat for the elephants in Sabah including the important corridors for the population; (5) Identify the current and future threats for the elephant population and provide to the Sabah Wildlife Department, the conservation and management measures based on spatial modelling, population and habitat viability modelling and population genetics data; and (6) Assist Sabah Wildlife Department in the preparation of the Sabah Elephant Management Plan.

5. Sabah Forestry Department: A partnership has been developed with the Sabah Forestry Department. Approval was given to us to enter all Forest Reserves throughout Sabah with the aim of carrying out sampling of elephant dung. Access to 15 forest reserves has been given.

6. Other partnerships: (1) After the submission of a proposal to the US Fish and Wildlife Service Asian Elephant Conservation Fund (AECF) for our work in Sabah, the PDRA has been approached by the Program Officer (Dr Meenakshi Nagendran) for the AECF to establish links and develop collaboration with their grantees in South-East Asia. According to him, there is a great need for elephant dung-DNA sampling expertise for population estimates in South-East Asia, and he recognised that our expertise and laboratory at ITBC, UMS appear to be ideal for such collaboration. They have many grantees who need to have their samples analysed and Dr M. Nagendran has mentioned to them our laboratory in Malaysia. He sent a general email to their grantees (see below) and so far, one grantee from Fauna Flora International working on Cambodia elephant has contacted the PDRA to establish collaboration on population size estimation in SW Cambodia using large-scale faecal-DNA survey. We have positively responded and we are currently discussing routes of collaboration.

Email sent by Dr Meenakshi Nagendran on March 26, 2007, to AECF grantees:

“Dear Partners, During my recent trip to Cambodia we discussed the possibility of Dr. Benoit Goossens, a Conservation Genetecist and Senior Research Associate at the University of Malaysia in Sabah, possibly collaborating on elephant dung-DNA analyses to aid in population surveys, etc. Since then I have been in touch with Dr. Goossens and he is very happy to discuss such collaboration directly with all of you. Please establish contact with Dr. Goossens (he has been copied here), and let us know how we can help further. Best wishes, Meenakshi Nagendran, Ph.D., D.V.M., Program Officer, Asian Elephant Conservation Fund”

(2) Another link has been established with Dr JA Lenstra and Dr Chatchote Thitaram from the Faculty of Veterinary Medicine, Utrecht University, The Netherlands who conduct genetic analyses on Thailand elephant populations and would like to compare their data with our Bornean elephant data. We have decided to use the same panel of microsatellite markers to be able to compare various populations.

3. Project progress

3.1 Progress in carrying out project activities

Research

PDRA spent five months (April 1 to August 31, 2006) in Cardiff University to perform genetic analyses on the DNA extracted at the Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah, together with trainee 1. Twenty-five microsatellite markers for African and Asian elephants were tested on the elephant faecal DNA extracted previously, and five multiplex (16 markers) were designed for the Bornean elephant. Unfortunately, we did not manage to genotype the samples collected in the Lower Kinabatangan Wildlife Sanctuary (see location on Map 1, annex 3) due to technical problems. However, we were able to carry out mitochondrial DNA sequencing for about 30 individuals from the Kinabatangan and nine captive elephants. As with previous studies, no haplotype variation was detected. PDRA and Trainee 1 returned to Sabah in the beginning of September and are currently genotyping the Lower Kinabatangan Wildlife Sanctuary samples, as well as samples collected in different populations in Sabah. Sampling in the different forest reserves of the state of Sabah started in October 2006 and is ongoing until November/December 2007. So far, samples have been collected in Zone 1 of Map 1 (Annex 3), in the Sepagaya, Ulu Segama, Malua, Kuamut, Malubuk and Malubuk Forest Reserves. More than 150 samples have been collected in zone 1 where between 178 and 275 elephants have been estimated by WWF-AREAS (Alfred, 2002). Zone 4 (Kinabatangan) has been sampled in 2005 (more than 320 samples), and additional samples are still collected for identified individuals (as part of a paternity study). Additional expeditions will be carried out in May, June, July, August, October, November and December 2007 to complete zone 4 and sample zones 2, 3 and 5. Samples already collected are currently being analysed using 16 microsatellite markers, and genotyping for all Sabah populations and for the Kinabatangan Wildlife Sanctuary population will be completed by February-March 2008, and data analysed by May 2008 for the workshop which will be organised at the end of the project. Several samples per zone will be sequenced for mitochondrial DNA in Cardiff between September and December 2007.

The PL went to Sabah for 10 days in September 2006 for 1st year's evaluation, he met with all host country partners, including WWF (see above), and the project partners held a one-day workshop on PHVA results for the Kinabatangan Wildlife Sanctuary orang-utan project (resulting from DI 09-016) on 16th September 2006.

Training

Trainee 1 spent four months (May 1 to August 31, 2006) in Cardiff and was trained in molecular ecology techniques by the PDRA. Trainee 1 is taking part in all aspects of the project, including sampling and DNA extraction, sequencing, genotyping and data analyses. She is also trained in writing grant applications (she was involved in the two grants obtained with Disney and Columbus Zoo) and scientific papers (a paper on elephant morphometrics will be submitted to the Journal of Tropical Ecology very soon).

Teaching

A one-week training course in statistical analysis in wildlife monitoring and censusing was carried out at the Institute for Tropical Biology and Conservation, March 12-16, 2007. The course was co-organised by the French NGO HUTAN (Marc Ancrenaz) and Cardiff University

(Benoit Goossens), and funded by the Darwin grant and ITBC (provided facilities and computers). The course was taught by Marc Ancrenaz.

Eighteen staff from governmental (Sabah Forestry Department, two staff from Ulu Segama-Malua Project) and non-governmental (SOS Rhino: one staff member from Tabin Wildlife Reserve; WWF-Malaysia: one staff from SOREL project; WWF-Indonesia: two staff; HUTAN: five staff from Orangutan Research Unit; Sumatran Orangutan Conservation project: one staff; Borneo Orang-utan Survival Foundation: one staff) organisations as well as representatives from the private sector (Yayasan Sabah: one staff member from Imbak, one staff member from Danum Valley and one staff member from Maliau Basin) attended the course. Trainee 1 also followed the course, as well as one other UMS Master student. Most of the students were already involved in the first training course, which was held last year in the field site of HUTAN, in the Kinabatangan.

The students were taught basic statistics and the use of SSPS software. They were also introduced to the use of the software DISTANCE, which is used to estimate wildlife densities after line transects have been carried out in the field. Opportunity was taken to analyse data from the field surveys carried out by the Sabah Forestry Department in Ulu Segama-Malua Forest Reserves between August 2006 and March 2007 and orang-utan surveys carried out by WWF-Indonesia in Sebangau National Park.

This course was not only the opportunity to gather staff from different organizations working on wildlife in Sabah and in Indonesia, exchange ideas and views; it was also the opportunity for these staff to extend their knowledge in wildlife monitoring and statistics.

All participants received a diploma at the end of the course. Press releases were published in the local press the following week.

We are intending to run this course every year if funding is available, since it was extremely well received by the current participants. We will combine field work and data analyses during the same course, and the course should last two to three weeks.

Conclusion: All activities have been carried out in the manner and time planned, although delay has been encountered in providing genotyping data on the Kinabatangan Wildlife Sanctuary population. All genotyping data for the Kinabatangan Wildlife Sanctuary and the Sabah populations will be achieved by February-March 2008, and data will be analysed on time to be presented at the workshop which will be organised at the end of the project, in May 2008.

3.2 Progress towards Project Outputs

All outputs for the reported period have been achieved. Trainee 1 has received laboratory training in molecular ecology and has been involved in all parts of the project. Fieldwork and collection of samples in the whole state of Sabah has started as planned and has been more successful than we could have expected. Sampling in Sabah will be ongoing until December 2007. Laboratory work is carried out at the Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah and genotyping of the Kinabatangan Wildlife Sanctuary population and Sabah populations is currently ongoing. A training course on statistical analysis in wildlife monitoring and censusing has been carried out in March 2007 and has attracted 18 participants from Malaysian and Indonesian NGOs and GOs.

We are confident that all outputs will be achieved by the end of the project.

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						
8	PDRA to Sabah for fieldwork & labwork, & field/laboratory training of trainee 1	28	28			56
	PL to Sabah for meeting all host country partners	2	2			4
4A	Trainee 1 receives training in the field & in the laboratory	1	1			1
4B		1 + 2	16 (Cardiff lab)			19
6A	NGOs and GOs staff receive one week training in wildlife monitoring	17	18			35
6B		1	1			2
14B	Talks on the project	1	1			2
15A	Press releases in national (Malaysia) newspapers	2	2			4
15B	Press releases in local (Sabah) newspapers	5	5			10
23	Disney Wildlife Conservation Fund, Columbus Zoo and Aquarium Conservation Fund		\$5,000, \$10,000			\$15,000
New - Project specific measures						

Table 2 Publications

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

3.4 Progress towards the project purpose and outcomes

The project purpose is to provide data on ecology, genetics, social structure, dispersal and conflict activities of the Bornean elephant *E. maximus borneensis* in fragmented habitat through extensive field study and laboratory training and capacity building in Sabah.

We have made progress towards the project purpose and its outcomes by achieving a large part of the sampling (completion by December 2007), testing the molecular markers which will be used for genotyping and starting the genotyping (completion by February-March 2008). We have also produced an awareness poster and we have re-established working relationships with one of our partners, WWF-Malaysia (see above). Laboratory training and capacity building is ongoing with the full time involvement of one UMS Master student in the project.

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

It is very difficult to measure positive biodiversity impacts. Indirectly, the project is working towards producing an impact on elephant conservation in Sabah by closely working with the Sabah Wildlife Department, by spending considerable amount of time in the field and therefore providing indirect protection to wildlife in the areas surveyed. The PDRA and the PP are strongly involved in the writing-up of the Kinabatangan Elephant Population Management Plan and data collected during the project will be included in the plan. We are also raising awareness in the Kinabatangan and in Sabah, by producing an education poster on the threats to the survival of the Bornean elephant and the solutions to prevent its extinction.

4. Monitoring, evaluation and lessons

Field work and laboratory work have been monitored through regular meetings/discussions between PDRA, PL and PP. Both PDRA and PP maintain excellent contacts with the Director and the Deputy Director of SWD and discuss progress and outputs on a monthly basis. The PL and PDRA have very regular contact (often on a daily basis).

If there is one lesson that we can pick up from this year is to “never give up” since we managed to re-establish working relationships with WWF-Malaysia.

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

We have taken action in response to first year review about raising awareness. While we are still planning to produce a booklet on elephant awareness at the end of the project, we have recently produced two education posters (one in Malay, one in English), which present the status, distribution and some biological characteristics of the Bornean elephant as well as the threats to its survival and the solutions to prevent its extinction. The poster is currently in press and should be ready in May 2007. It will be showed at the new Wildlife Park in Kota Kinabalu, at the Headquarters of Sabah Wildlife Department, Sabah Forestry Department, Sabah Parks, Yayasan Sabah, Sabah Society,..., at tourist lodges, at the different field research centres (Danum Valley, Maliau Basin,...), at rural schools in the elephant's range, at universities and education/nature centres, etc. The poster will be publicised in the local media.

6. Other comments on progress not covered elsewhere

The project does not face any particular risk. It has been extremely successful and has encountered considerable attention by the host country.

7. Sustainability

Every effort has been made to publicise the project in the local and national press. Press releases were picked up in March 2007 to talk about the training course (Daily Express, New Sabah Times and New Straits Times).

We also publicised additional results of the previous Darwin project on orang-utans (DI 09-016) carried out by the same team, following the one-day workshop on the Kinabatangan orang-utan population and habitat viability analysis that was held at the Sabah Wildlife Department Headquarters in September 2006. More than ten national, local and international newspaper articles and web pages covered the results obtained. A scientific paper is in preparation and will be submitted to the journal Conservation Biology in the next few months.

One satisfactory exit strategy is already in place: a management plan for the Kinabatangan Elephant Population has been drafted by the PDRA and PP and is currently in the hands of the SWD for review. We expect it to be finalised by the end of the project.

8. Dissemination

We have established strong links with the local (Sabah) and national (Malaysia) press and disseminate our work as much as possible. Dissemination activities will continue by the host country when the project finishes since all participants of the project have excellent relationships and will keep working together for many years.

9. Project Expenditure

Table 3 Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

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](#)

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
<p>Goal: <i>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</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>			<p><i>(do not fill not applicable)</i></p>
<p>Purpose Provide data on ecology, genetics, social structure, dispersal and conflict activities of the Bornean elephant <i>E. maximus borneensis</i> in fragmented habitat through extensive field study and laboratory training and capacity building in Sabah.</p>	<p>Studies of Bornean elephant populations by trained local field assistants by yr 2.</p> <p>Population demographic and genetic analyses by Malaysian (MSc) student by yr 3, supervised by PL, PDRA, PP and John Payne (WWF).</p> <p>Ecological data (distribution, movements, population growth, social structure, dispersal) on Kinabatangan elephant population by KOCP by yr 3</p>	<p>We are not yet at the stage where we can provide data on ecology, genetics, social structure, dispersal and conflict activities.</p>	<p>Key actions for next period:</p> <p>Complete elephant population sampling in Sabah</p> <p>Analyse the samples collected in the Kinabatangan and in Sabah</p> <p>Continue the training of Malaysian MSc student</p>
<p>Output 1.</p> <p>DNA bank for Bornean elephant species in Sabah and Cartography</p>	<p>Elephant populations in Sabah sampled by yr 2</p>	<p>Sampling in Sabah is ongoing (see activity 1.1) and should be completed by December 2007.</p>	

of all Bornean elephant populations in Sabah and genetic mapping of all populations.	Surveys in Sabah by yr 2 and inclusion of ecological & genetic data. Identification of conservation issues.	Mapping of populations is ongoing (during sampling). Conservation issues will be identified at the end of the project and included in the management plan.
Activity 1.1. Sampling of all elephant populations in Sabah		Kinabatangan Wildlife Sanctuary; Sepagaya, Ulu Segama, Malua, Danum Valley, Malubuk and Kuamut Forestv Reserves sampled (more than 500 samples collected)
Activity 1.2. Genotyping of all populations in Sabah		Sixteen microsatellite markers selected and five multiplex designed. Genotyping is ongoing.
Output 2. Training of Sabah field assistant and Training of local MSc student	Training of more than 15 field assistants in wildlife monitoring and one local MSc student trained by year 3.	Second phase of the training achieved during the second training period held at ITBC in March 2007. MSc student trained in non-invasive sampling and molecular ecology techniques.
Activity 2.1. Training of more than 15 NGOs and GOs staff in wildlife monitoring and censusing		Training achieved during the second phase.
Activity 2.2. Training of one MSc student		Training in molecular ecology techniques has been carried out at Cardiff University. The trainee is involved in all activities of the project.
Output 3.		

Results disseminated	3 papers published in scientific journals by yr 3, 1 radio broadcast (BBC), workshop proceedings published	We are still too early in the project and do not have any results to publish yet.
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Annex 2 Project's full current logframe

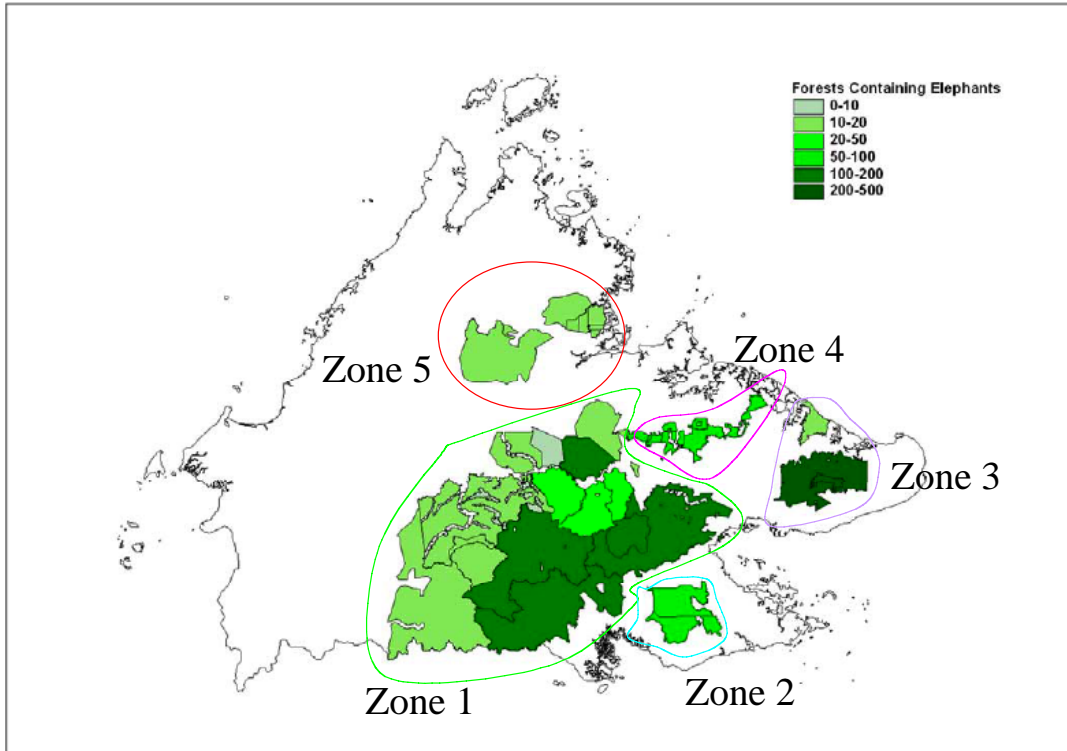
Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Goal:</p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> • 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 			
<p>Purpose</p> <p>Provide data on ecology, genetics, social structure, dispersal and conflict activities of the Bornean elephant <i>E. maximus borneensis</i> in fragmented habitat through extensive field study and laboratory training and capacity building in Sabah.</p>	<p>Studies of Bornean elephant populations by trained local field assistants by yr 2.</p> <p>Population demographic and genetic analyses by Malaysian (MSc) student by yr 3, supervised by PI's, John Payne (WWF) & PDRA.</p>	<p>Publications of results in scientific journals and local popular press.</p> <p>Inclusion of ecological, population demographic and genetic data in Management Plan for the Bornean elephant in Sabah.</p>	<p>Governmental authorities from host country will use ecological, population demographic and genetic data in long-term management plan for the Bornean elephant populations.</p>

	<p>Ecological data (distribution, movements, population growth, social structure, dispersal) on Kinabatangan elephant population by KOCP by yr 3</p>	<p>Dissemination of results during international workshop held in Sabah.</p> <p>Field survey reports.</p> <p>Samples collected.</p>	
<p>Outputs</p> <p><i>DNA bank for Bornean elephant species in Sabah</i></p> <p><i>Cartography of all Bornean elephant populations in Sabah and genetic mapping of all populations.</i></p> <p><i>Training of Sabah field assistants</i></p> <p><i>Training of local MSc student</i></p> <p>Results disseminated</p>	<p><i>Elephant populations in Sabah sampled by yr 2</i></p> <p><i>Surveys in Sabah by yr 2 and inclusion of ecological & genetic data. Identification of conservation issues.</i></p> <p><i>3 local field assistants trained in census & surveys by yr 2</i></p> <p><i>1 MSc student and 1 technician trained by yr 3</i></p> <p>3 papers published in scientific journals by yr 3, 1 radio broadcast (BBC), workshop proceedings</p>	<p><i>Collection of samples available in host lab.</i></p> <p><i>Field survey reports and management plan available for stakeholders involved.</i></p> <p><i>Field survey reports and monitoring of skills learned.</i></p> <p><i>Master diploma obtained by student.</i></p> <p>Copies of all publications, recordings, video and proceedings sent to Darwin Initiative.</p>	<p><i>Large sample size obtained in host country.</i></p> <p><i>Cooperation between stakeholders for implementation of Action & Management Plans.</i></p> <p><i>Trainees motivated for training & for transmission of skills learned.</i></p> <p>MSc graduate promotes and disseminates skills.</p>

	published		
<i>Activities</i>		<i>Activity Milestones</i>	
<i>Field and ecology research programme</i>		<i>Yr 1: Training of 3 Sabah field assistants in elephant census & survey methods. Sampling, censusing and monitoring of LKWS elephant population. Yr 2: Sampling, censusing and monitoring of Sabah populations. Yr3: Generation of ecological data base for Bornean elephant.</i>	
<i>Genetic research and training programme</i>		<i>Yr 1: Training of Malaysian MSc in sample collection and genotyping of LKWS elephant population by Malaysian MSc & PDRA. Yr 2-3: Genotyping of Sabah populations by Malaysian MSc & PDRA, analyses & writing-up. Yr 2: Trainee 1 obtains MSc qualification. Yr 3: Generation of genetic data base for Bornean elephant.</i>	
<i>Conservation programme</i>		<i>Yr 1: Production by HUTAN/KOCP, SWD and CU of a booklet on elephant awareness to be distributed to local people during surveys and census. Yr 2: Implementation of Sabah elephant Action Plan. Yr 3: Intl workshop of Asian elephant conservation and production of a resolution. Production of a management plan for the Bornean elephant in Sabah. Dissemination of skills learnt by the KOCP "Elephant Conservation Unit"</i>	

Annex 3 onwards – supplementary material (optional)

Map 1: Location of the five sampling zones in Sabah



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.	x
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?	x
Do not include claim forms or communications for Defra with this report.	