

## ***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, excluding annexes

Submission deadline 30 April 2008

### Darwin Project Information

Project Ref Number	15/036
Project Title	Monitoring and Managing Biodiversity Loss in South-East Africa's Montane Ecosystems
Country(ies)	U.K., Malawi, Mozambique
UK Contract Holder Institution	Royal Botanic Gardens, Kew
UK Partner Institution(s)	Royal Botanic Gardens, Kew BirdLife International
Host country Partner Institution(s)	Mount Mulanje Conservation Trust (MMCT); Forestry Institute of Malawi (FRIM); Mozambique National Institute of Agronomic Research (IIAM).
Darwin Grant Value	£198,632
Start/End dates of Project	July 2006 to July 2009
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 Apr 2007 to 31 Mar 2008) and annual report number 2
Project Leader Name	Dr Paul P. Smith
Project website	<a href="http://www.kew.org/science/directory/projects/DarwinMozambique.html">www.kew.org/science/directory/projects/DarwinMozambique.html</a>
Author(s), date	Paul P. Smith, Jonathan Timberlake & Julian Bayliss

## **1. Project Background**

This project has been generated out of the activities undertaken by the Mulanje Mountain Conservation Trust (MMCT), the Royal Botanic Gardens, Kew (RBG Kew) and the Forestry Research Institute of Malawi (FRIM) on Mt Mulanje in southern Malawi over the past 5 years or so. Mulanje is the highest mountain in south east Africa, and home to around 70 endemic species of plant and a similarly unique fauna. It is also part of a larger montane archipelago that stretches into neighbouring Mozambique. MMCT has the remit to protect the ecosystem health of Mt Mulanje through sustainable resource utilization and strict management guidelines, in collaboration with the Malawi Forest Department & FRIM. RBG Kew has also been working on Mt. Mulanje since 2004 focusing on collecting and preserving seeds of endemic and threatened plant species in collaboration with FRIM and MMCT. MMCT has also been collaborating with the Zambezia Province Dept. of Agriculture in Mozambique on montane conservation issues, and liaising with NGOs such as World Vision and CARE International that are active in development work in northern Mozambique. Discussions with technical staff from the Mozambique National Institute of Agronomic Research (IIAM), specifically from the Forest Research Department and the National Herbarium, identified the urgent need to investigate and protect montane massifs in parts of Mozambique adjacent to Mount Mulanje. BirdLife International has been active in these areas through the African Bird Club and Mozambique Natural History Museum, and has made preliminary visits to Mt Mulanje (Malawi) and Mt Namuli (Mozambique). As a result all of these sites have been listed as Important Bird Areas.

The main purpose of this project is to gather information and develop tools and skills to enable the monitoring and management of biodiversity loss in montane ecosystems in this part of SE Africa. The project will (1) Carry out field surveys of the biodiversity-rich montane archipelago of SE Africa, (2) Equip and train a team of Malawian and Mozambican nationals to gather and utilize data for monitoring and management purposes, (3) Develop an Ecological monitoring programme (EMP) for the selected mountains, (4) Develop species and habitat recovery plans, and (5) Make recommendations for conservation management of selected areas based on field results.

## **2. Project Partnerships**

The project partnerships have progressed well this year. Strong relationships have been forged on the expeditions (which have been physically challenging) and at the training workshop. A total of 17 and 23 people joined the May and November Namuli expeditions respectively. All the project partner institutions were well represented on these trips, but there was also participation from six external experts including people from the Museum of Natural History in Maputo and the British Museum. The Remote Sensing training workshop was attended by seven trainees. Four were from the project partners IIAM and MMCT, the remainder from other Mozambican institutions.

RBG Kew has had a strong leadership role in organising and carrying out field and training activities. Three Kew staff were on each of the Namuli expeditions, and training was given to local counterparts in botanical survey and plant collection techniques. In addition, a Kew member of staff led the Remote Sensing training workshop in Maputo in October/November 2007.

## **3. Project progress**

Excellent progress has been made in all aspects of the project so far, with all activities leading to good progress on project outputs. These are outlined in more detail below.

### 3.1 Progress in carrying out project activities

The project activities scheduled for this reporting period were:

1. To produce a technical report for Mount Chiperoone, including a management strategy, IUCN assessments and species recovery plans (Outputs 1-4).
2. To establish an ecological monitoring programme on Mount Namuli, including a GIS for the mountain (Output 1).
3. To produce a technical report for Mount Namuli, including a management strategy, IUCN assessments and species recovery plans (Outputs 1-4)
4. To run a training workshop on the development and implementation of ecological monitoring programmes (Output 5)

*1. To produce a technical report for Mount Chiperoone, including a management strategy, IUCN assessments and species recovery plans (Outputs 1-4).*

During this reporting period the full technical report on Chiperoone mountain was produced by the team. This document is appended (**Annex 3**), and shows that an estimated 30-40% of forest cover has been removed from Chiperoone in the past 37 years. Fire appears to be the greatest current threat to the forest on Chiperoone. The ecological monitoring programme established on Chiperoone, through this project, includes a botanical baseline which has identified and described the major vegetation types on the mountain. A total of 229 plant taxa were recorded on Chiperoone, including 15 taxa not on the Mozambique plant checklist. A threatened coffee species, *Coffea mufindensis*, was also noted. The zoological survey discovered a lizard species (*Lygodactylus rex*) and a butterfly species (*Cymothoe melanjae*) thought previously to be endemic to Mulanje, thereby extending their known range not only to another mountain but to another country. Another significant discovery was that of the bat species, *Miniopterus inflatus*, only the second record of this species in Mozambique. The bird survey also recorded a number of globally threatened and range-restricted species, including *Alethe choloensis*, *Apalis chariessa* (only known site in Mozambique), and the woodland species *Nectarinia shelleyi*. The report details threats and conservation issues on Chiperoone, and makes a series of recommendations. Species conservation assessments and recovery plans (outputs 2 and 4) will follow near the end of the project, when all the montane sites have been surveyed.

*2. To establish an ecological monitoring programme on Mount Namuli, including a GIS for the mountain (Output 1).*

Following the Chiperoone survey, a second ecological monitoring programme was set up on Mount Namuli during an expedition run from May 22<sup>nd</sup> till June 5<sup>th</sup>. This expedition comprised a total of 17 people from Mozambique, Malawi and the UK. In addition, we have produced a field guide to the 10 endemic or interesting plant species on Namuli. In most cases these species are only known from one or two specimens. Mount Namuli is the largest site to be surveyed during this project, and it was decided (and agreed by Darwin) that we should revisit this massif in November, a more suitable time for bird surveys, and also in order to collect a more comprehensive baseline of plant species.

The second expedition was run from 13<sup>th</sup>-27<sup>th</sup> November. This expedition comprised a total of 23 people from Mozambique, Malawi and the UK. A report detailing both Namuli expeditions is appended to this document (**Annex 4**).

3. To produce a technical report for Mount Namuli, including a management strategy, IUCN assessments and species recovery plans (Outputs 1-4)

A draft technical report for Mount Namuli is appended to this document (**Annex 5**). Its main findings are as follows:

Combining present and past surveys, a total of 195 plant species have been recorded to date, 80 of which are tree/shrub species. Around 40% of the plant collections from the two expeditions have been identified so far, and this forms the main basis of the list. It is estimated that further identification work will add another 200 taxa. Twelve of the plant species identified so far are thought to be endemic to Namuli or immediately adjacent areas, including two species believed to be new to science (a *Crotalaria* sp. nov., and an *Indigofera* sp. nov.). Two species previously believed to be Mulanje endemics have been found, *Senecio peltophorus* and *Lobelia blantyrensis*. This indicates both the linkages between these montane areas and also the extent of under-collection of mountains in Mozambique compared to the better-collected Malawi.

With vertebrates 62 mammals, including the endemic Vincent's squirrel have been recorded. Of particular note was the capture of the bat *Pipistrellus rusticus*, mist-netted in Manho forest at 1700m. This is the first record of this species for Mozambique, although it is known from Zomba in S Malawi.

The birds of Namuli are described in the report in Annex 3, but are also described in more detail in a separate report (**Annex 6** 'Survey of birds on Namuli Mountain (Mozambique), November 2007, with notes on vegetation and mammals'). A total of 155 bird species have been recorded on Namuli. The forests of Namuli are especially important in respect of the Namuli Apalis, *Apalis (thoracica) lynesii* (endemic to Namuli, RDB category: Vulnerable) and the Dapple-throat *Modulatrix (Arcanator) orostruthus* (Vulnerable). The latter is represented by the nominate endemic race; two other populations occur in the mountains of eastern and central Tanzania. The Namuli forests also contain significant numbers of the Endangered Cholo Alethe, *Alethe choloensis* (endemic to south-east Malawi and adjacent northern Mozambique) and of the race *belcheri* of Green Barbet, *Stactolaema olivacea*, shared with Thyolo Mountain, Malawi. Since the forest on Thyolo has been totally destroyed in recent years, Namuli has become the only refuge for this localized race. Another two bird species of conservation concern have been discovered on the mountain during this survey: the Spotted Ground Thrush *Zoothera guttata* (Endangered) and White-winged Apalis, *Apalis chariessa* (Vulnerable). The discovery of Eastern Green Tinkerbird, *Pogoniulus simplex*, is of biogeographical interest. This is an Eastern endemic previously known from only one site in Mozambique (in coastal thicket near Maputo).

Reptiles and amphibians were only surveyed briefly, but 13 were collected, including an endemic pygmy chameleon collected first by Dijkstra on the de Melo expedition in 2001, which is to be named *Rhampholeon tilburyi* (in prep.). A number of Mt Mulanje endemics such as *Lygodactylus rex*, *Notophryne*, *Strongylopus fulleborni* and *Arthroleptis francei*, were also collected thus confirming the biogeographical link between Mulanje and Namuli.

Butterflies were looked at in more detail with 106 being recorded, including two new species (*Cymothoe* sp. nov. and *Uranotauma* sp. nov.) and one new subspecies (*Neocoenyra bioculata* subsp. nov.). Also identified was a suspected new subspecies of *Papilio pelodorus*, but further specimens are required in order to determine its exact status. Of the 106 species collected, 46 are new records for Mozambique when compared to the butterfly checklist published in Butterflies of Mozambique (Cabral 2000). Species lists are given in the report.

The most important habitats for biodiversity conservation are the upland grasslands on peat and moist evergreen forest (both montane and medium-altitude). The peat grassland is not under major threat, nor is montane forest, although fire and selective logging for *Faurea wenzeliana* are having an impact, and there appears to be an increasing number of patches within the forest cleared for cultivation of Irish potato. The grasslands on the western side of the massif are grazed by domestic livestock (cattle, goats); expansion of this coupled with associated fires is helping drain the grasslands and eating into the forest. Of greater concern is the increasing destruction of medium-altitude forest and riparian forest along the main streams below 1600 m by cultivation and fire. Other significant threats are feral pigs rooting up species-rich vegetation over seepages, and heavy hunting pressure on mammals, edible species now being scarce and predators mostly absent.

The biological linkages between the various montane areas in N Mozambique and S Malawi are shown, suggesting a coordinated approach to conservation would be beneficial. The main conservation issues for Namuli are outlined, along with suggestions for its conservation and management.

#### *4. To run a training workshop on the development and implementation of ecological monitoring programmes (Output 5)*

Remote sensing studies have been carried out on both Chipero and Namuli to date. The imagery and information associated with these studies has been made available to all project partners and these data, applied to ecological monitoring, formed the basis of the training workshop in November in Mozambique (**Annex 7**). The aim of this workshop was to train a team of professionals in Mozambique in Remote Sensing theory and the practical use of image processing software (Erdas Imagine) within Kew's methods for vegetation mapping.

To provide this training in context and to ensure that all participants had the minimum GIS knowledge required, sessions on the basics of GIS were conducted along with introductory talks on the Darwin Initiative Project and examples of the work done so far.

As a result of the workshop, two of the participants from our partner institution (IIAM) were trained in the use of Erdas Imagine, and in Kew's methods to generate vegetation maps. These two people will be able to take over from Kew with the Remote Sensing work needed in the remaining montane ecosystems sites. Support will still be given from RBG Kew, but the GIS unit at IIAM is in a position now to produce vegetation and land cover maps from a combination of satellite images and field data and to provide the remote sensing support needed in the project.

The rest of the participants work for institutions in Mozambique directly involved in conservation or related environmental fields. This workshop has provided the opportunity to create a team of local professionals, who will bring the latest remote sensing technology to other organisations in country.

Feedback from the workshop showed that 60% of the participants were already familiar with the software but found Kew's vegetation mapping methods extremely useful and applicable to their field of expertise. The remaining 40% were not familiar with remote sensing and found this workshop a valuable first approach to GIS and remote sensing

#### *Additional activities*

Our project partners IIAM in Mozambique have been approached by a development NGO, Aquifer, who are interested in the sustainable conservation of Mount Namuli. Jonathan Timberlake has written a proposal outline for them (see **Annex 8**). We hope that this will result

in the establishment of a conservation project on Mount Namuli involving our Mozambican government partner, IIAM, and local communities.

A poster on the project was presented at the AETFAT Congress in Cameroon, and also at the Systematics Association Conference in Aug 2007 in Edinburgh. An illustrated article on the project was published in Kew Magazine (**Annex 9**), and the project featured in Kew's Annual Review. In addition, a paper has been submitted to the journal Ostrich and accepted (**Annex 10**). The project is now on Kew's website: ([www.kew.org/science/directory/projects/DarwinMozambique.html](http://www.kew.org/science/directory/projects/DarwinMozambique.html)).

### **3.2 Progress towards Project Outputs**

*Output 1: Ecological monitoring programmes (EMPs).* EMPs have been established on Mounts Mulanje, Chipirone and Namuli to date. The studies carried out on these mountains will form a baseline against which to measure future changes and the effectiveness of conservation and management strategies.

*Output 2: IUCN red data listings for threatened species.* Detailed information has been gathered on the status of rare and threatened species on all the mountains surveyed thus far (Mulanje, Chipirone, Namuli). These data will be used to produce IUCN species assessments at the end of the project when the status of these species is known across the montane archipelago.

*Output 3: GIS biodiversity database.* All the survey and specimen data collected on the expeditions is geo-referenced and entered into a Geographical Information System (GIS). The project partners are actively developing and using this GIS to monitor trends and to formulate conservation and management strategies.

*Output 4: Management strategies, including species recovery programmes.* The Chipirone and Namuli technical reports each make recommendations for the management of these mountains. These recommendations are largely based on the findings of the expeditions, but also incorporate knowledge gained from the implementation of similar management strategies on Mount Mulanje. This experience of implementation is a vital component of this project, and part of the rationale for involving MMCT in this cross-border initiative. Many of the recommended management strategies will have implications for species recovery but in addition, individual species recovery plans will be produced together with IUCN species assessments near the end of the project when all the mountains have been surveyed.

*Output 5: Trained personnel.* Seven people were trained in remote sensing techniques applied to ecological monitoring on a three day formal course held in Maputo in November 2007. Training was given by a Kew specialist supported by her Malawian and Mozambican counterparts. Informal training in survey, identification and specimen collection was given by 3 Kew and Birdlife experts on the May Namuli expedition, and by 5 Kew and Birdlife experts on the November expedition. 15 different Mozambicans and Malawians benefited from this training on the expeditions.

## **Standard Measures**

**Table 1 Project Standard Output Measures**

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Total planned from application
6A	Number of people received other forms of education/training	29	22			51	16
6B	Number of training weeks provided	3	5			8	Not specified
8	Number of weeks spent by UK project staff on project work in the host country	3	5			8	Not specified
9	Number of habitat management plans (or action plans) produced for Governments, public authorities, or other implementing agencies in the host country		2			2	5
10	Number of individual field guides/manuals to be produced to assist work related to species identification, classification and recording	2	1			3	5 (combined)
11B	Number of papers to be submitted to peer reviewed journals		1			1	Not specified
12A	Number of computer based databases to be established and handed over to the host country		1			1	1 (combined)
13A	Number of species reference collections to be established and handed over to the host country(ies)	400	400			800	Not specified

14A	Number of conferences/seminars/ workshops to be organised to present/disseminate findings	2	1			3	5
14B	Number of conferences/seminars/ workshops attended at which findings from Darwin project work presented/ disseminated.		2			2	Not specified
15A	Number of national press releases in host country(ies)		1			1	Not specified
17A	Number of dissemination networks to be established	1				1	Not specified
New - Project specific measures							

In Table 2, provide full details of all publications and material produced over the last year that can be publicly accessed, eg title, name of publisher, contact details, cost. Mark (\*) all publications and other material that you have included with this report.

**Table 2 Publications**

Type *	Detail	Publishers	Available from	Cost £
(eg journals, manual, CDs)	(title, author, year)	(name, city)	(eg contact address, website)	
Magazine	*Mountain mission. J. Timberlake. Kew magazine, Winter 2007. pp48-49.	RBG Kew, London	www.kew.org	See Annex 9
Journal	*Spottiswoode, C.N., Patel, I.H., Hermann, E. &	Ostrich (South Africa)	Submitted for publication	See Annex 10



	Bayliss, J. Threatened bird species on two little-known mountains (Mabu and Chipero) in northern Mozambique.			
--	---	--	--	--

### **3.3 Progress towards the project purpose and outcomes**

We are making good progress towards our project purpose - to gather information and develop tools and skills to enable the monitoring and management of biodiversity loss in montane ecosystems in SE Africa. We have developed an effective network of conservation practitioners in the UK, Malawi, Mozambique and South Africa. In addition, we have developed methodologies for biodiversity assessment, and produced tools such as rare plant field guides for the mountains we have surveyed so far (Mulanje, Chipero and Namuli). We have also carried out formal training workshops on plant identification techniques and the use of remote sensing in ecological monitoring. The three expeditions we have run have enabled the delivery of hands on training in field assessment techniques to a wide range of people. The information we have gathered on Mounts Mulanje, Chipero and Namuli is novel and of great potential utility in monitoring and managing the biodiversity on these mountains. This ranges from information on forest intactness (and threats) to population data for rare and threatened species. All of this information is digital, and easily accessible via a Geographical Information System.

### **3.4 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits**

Our next tasks involve setting up EMPs on two more mountains – Mchese (Malawi) and Mabu (Mozambique), producing management strategies for these areas, and then synthesising all the information and knowledge that we have in order to produce species assessments, species recovery plans and an overall strategy for managing the biodiversity of the SE African montane archipelago in a coherent and sustainable way.

## **4. Monitoring, evaluation and lessons**

We continue to learn from our experiences as this project progresses. This is manifest in the changes that we have made to the original programme. We have had to move expeditions around according to phenology and logistical issues such as accessibility and the weather. We have also modified our target mountains from the original list of five mountains in Mozambique (Namuli, Chipero, Mabu, Inago and Cucutea) to four mountains in Mozambique and Malawi (Chipero, Namuli (two expeditions), Mchese and Mabu). These changes are largely the result of our reconnoitre work enabling us to differentiate and prioritise the areas of highest diversity. An encouraging feature of the project continues to be the feedback we have received from experts who have received specimens collected by the team, and participation on expeditions by experts in different fields. Currently, the focus is on collecting as much baseline information as possible, but our methodology will continue to evolve, via monitoring and peer review from our users. These are, primarily, foresters, conservationists and botanists employed by the Governments of Mozambique and Malawi, other international biologists and ultimately policy makers.

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

Responses to queries in the Year 1 annual review:

- We can confirm that an MoU between Kew and IIAM was developed and signed in October 2006
- The revised and updated logical framework is appended (**Annex 2**).
- We can confirm that the National Herbarium is engaged through FRIM, and that the Herbarium has been represented on both expeditions to date.
- Our overspend on the 'Others' budget line last year was primarily due to unforeseen GIS software costs for our African partners. In addition, postage costs were higher than expected due to the necessity of using courier services rather than the postal service, which is unreliable for urgent or valuable items. We therefore had to use the 'Others' budget for these purposes.

## **6. Other comments on progress not covered elsewhere**

As well as the individual technical reports, we would like to synthesise all of our survey findings into one publishable volume at the end of the project. This would enable us to combine our recommendations for conservation of species and habitats into one strategy for the whole montane archipelago. This will, however, require additional funding, which we are pursuing.

## **7. Sustainability**

The sustainability elements of this project are:

The data that we collect and the tools we produce, which will in most cases be the most thorough baseline information available on the biodiversity of these important habitats. This information is the basis of future monitoring of biodiversity trends, and is of sufficient species level detail to measure quantitative changes in biodiversity, and develop appropriate management strategies;

The people that we train. The skills that we are sharing in biodiversity assessment and monitoring will enable our Mozambican and Malawian counterparts to carry on this work after the project finishes. In addition, participation in a programme like this engenders a sense of ownership and responsibility for the future of the areas that we are assessing.

The network that we establish. Our current network comprises more than 20 individuals from many different disciplines. This network will not only expand, but is very likely to endure well beyond the life of the project in multiple forms, based on the personal and professional relationships established through this project.

The recommendations that we make. We fully expect that the recommendations that we make regarding the conservation and sustainable use of the biodiversity we describe will be taken seriously by the Government of Mozambique. At the very least, those recommendations, which will seek positive outcomes for biodiversity and people, will go on public record. At best, many of them will be implemented.

## **8. Dissemination**

Presentations on the project have been made in Mozambique and Malawi, including to the Governor of Milanje district in Mozambique. All reports will fully acknowledge Darwin support, and display the Darwin logo. Likewise, all scientific papers acknowledge Darwin support. The RBG Kew website includes details on this project:  
([www.kew.org/science/directory/projects/DarwinMozambique.html](http://www.kew.org/science/directory/projects/DarwinMozambique.html))

## 9. Project Expenditure

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

Item	Budget (please indicate which document you refer to if other than your project application)	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (eg postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others (maps, audit)			
Salaries (J. Bayliss & J. Timberlake)			
<b>TOTAL</b>			

Highlight any agreed changes to the budget and explain any variation in expenditure where this is +/- 10% of the budget.

The variation in the budget occurred in two areas:

- 1) Travel and subsistence. This was due to high demand for participation on the expeditions from both project partners and international experts.
- 2) Others. £183 was spent on acquiring historical maps of Mozambique – an unforeseen but important expense. £103 was spent on an audit of project finances.

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

The ecological monitoring programmes that have been established on Mounts Chipirone and Namuli are the first such comprehensive surveys carried out in the Mozambican montane archipelago. The data gathered is unique in its breadth and depth, reflecting the value of well-organised, multidisciplinary studies. We have documented forest extent and intactness; species lists for plants, birds, mammals, reptiles and insects; endemic taxa; species new to Mozambique; taxa new to science; and threats to habitats and species. This approach is resulting in the construction of an impressive baseline against which to measure future trends, impacts and management strategies.

[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: 2007/08

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
<p><i>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</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</p> <p>To gather information and develop tools and skills to enable the monitoring and management of biodiversity loss in montane ecosystems in SE Africa</p>	<p>Ecological Monitoring Programmes in operation.</p> <p>Management strategies for focal areas.</p> <p>Protection through increased awareness, knowledge and status.</p> <p>Trained personnel.</p>	<p>Baseline assessment methodology developed.</p> <p>Baseline assessment carried out on Mt Namuli</p> <p>Considerable new knowledge on biodiversity of Mt Namuli gathered, and made accessible.</p> <p>33 personnel trained in GIS, plant identification and baseline survey techniques</p>	<p>Further development of methodology</p> <p>Assessments to be carried out on Mounts Mchese and Mabu</p> <p>New methods and knowledge to be developed for other areas</p> <p>Further training as appropriate</p>
<p>Output 1.</p>	<p>Repeatable field-based plant and bird surveys carried out on 5</p>		

Ecological Monitoring Programmes	mountains: Mts Mulanje, Namuli, Chiperoone, Mabu and Mchese by project end.	
Activity 1.1 Ecological Surveys		Second survey carried out on Mount Namuli in May and Nov 2007
Output 2. IUCN Red Data Listings	Determination of species-population information. Conservation assessments for all threatened species entered into GIS.	
Activity 2.1. Red Listing		Species and population information gathered for plants, birds, mammals, reptiles and insects on Mt Chiperoone. Conservation assessments will be made at the end of the project when the whole study area has been surveyed.
Output 3. GIS biodiversity database	All field data to go into GIS throughout project. Design and publish GIS online by end June 2008. Database also available on CD.	
Activity 3.1. GIS mapping and database		All field data from Mounts Chiperoone and Namuli are electronic, and entered into a GIS that incorporates species information, specimen data, vegetation information and remote sensing imagery.
Output 4. Management strategies, including species recovery programmes, developed.	Management strategies produced for 5 mountains; recommendations presented to users and government implementation agencies. Identification of threatened species, threats, along with management	

	recommendations to ensure recovery.	
Activity 4.1. Management strategies developed		Recommendations have been made for the conservation of biodiversity on Mounts Chipirone and Namuli. These will be developed further, based on the results of the forthcoming surveys, and will be used to produce a management plan for the Mozambican/Malawian montane archipelago.
Output 5. Trained personnel	At least 6 Malawian/Mozambican nationals trained in each of plant identification, field survey techniques, and EMP development by June 2008.	
Activity 5.1. Training Workshops		Seven Malawian and Mozambican personnel were trained in remote sensing GIS techniques as applied to ecological monitoring in Maputo in November 2007. A further 15 Mozambican/Malawian scientists received informal training in survey, identification and specimen collection techniques on the two field trips.

## Annex 2 Project's full current logframe (revised at request of year 1 reviewer)

OUTPUTS	ACTIVITIES
1. Ecological monitoring programme	1.1 Carry out plant and bird inventory work in each of 5 montane areas.
	1.2 Carry out basic vegetation survey in each of 5 montane areas. Establish baselines.
	1.3 Assess & document main conservation threats for each site & across study areas.
	1.4 Prepare collection field guide to endemic & threatened plant species across study sites.
	1.5 Prepare technical reports of findings (historical & current) for each montane area.
2. IUCN Red Data listings	2.1 Determine & assess status of endemic, rare & threatened plant species for each study site and across area.
	2.2 Determine & assess status of endemic, rare & threatened bird species for each study site and across area.
	2.3 Carry out conservation assessments for selected species across N Mozambique / S Malawi area using GIS.
	2.4 Submit conservation assessments to IUCN for incorporation into global RDL
3. GIS biodiversity database	3.1 Establish GIS for study areas in Maputo & Kew; populate with basic data.
	3.2 Enter all field data (vegetation, collections) into GIS.
	3.3 Produce and make available GIS data on CD and on-line.
4. Management strategies & species action plans	4.1 Document threats, issues & potential conservation interventions for each massif.
	4.2 Develop species management plans for endemic & threatened plant & bird species across 5 study sites.

	4.3 Carry out advocacy at District, Provincial & national levels on biodiversity significance of montane areas and for implementation of appropriate conservation interventions
	4.4 Present main findings & recommendations to users and government implementation agencies.
5. Training personnel	5.1 Training of at least 6 Mozambique/Malawi nationals in plant identification.
	5.2 Field training of at least 6 Mozambique/Malawi nationals in plant collecting, vegetation survey & bird survey.
	5.3 Training of at least 4 Mozambique/Malawi nationals in remote sensing analysis & GIS techniques.



## **supplementary material (optional)**

**Annex 3: Chiperoone Technical Report**

**Annex 4: Namuli expedition report**

**Annex 5: Namuli technical report - draft**

**Annex 6: Namuli bird report**

**Annex 7: Remote sensing workshop report**

**Annex 8: Namuli conservation proposal**

**Annex 9: Kew magazine article**

**Annex 10: Ostrich paper (Spottiswoode et al.)**

### ***Checklist for submission***

	Check
Is the report less than 5MB? If so, please email to <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> putting the project number in the Subject line.	
Is your report more than 5MB? If so, please advise <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> 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.	