

# Darwin Initiative – Final Report

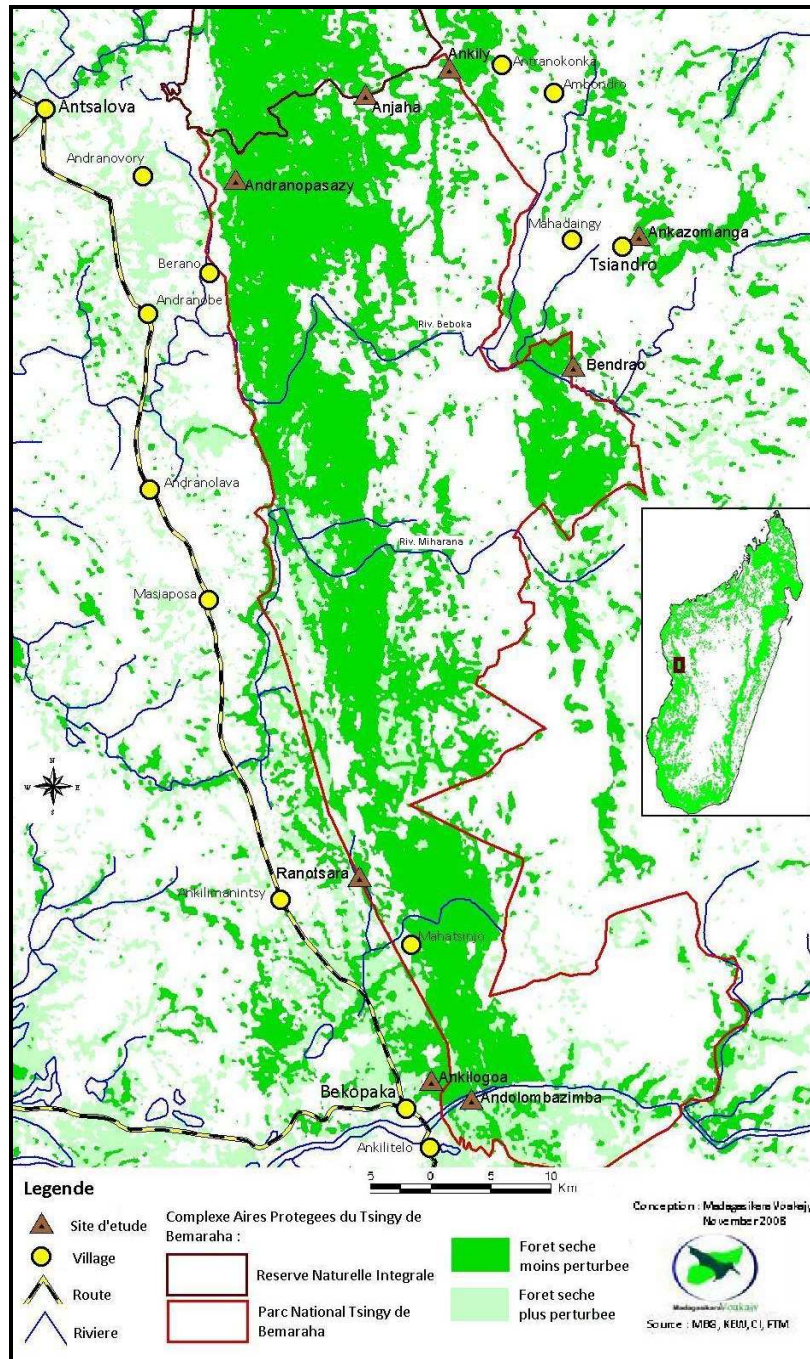
(To be completed with reference to the Reporting Guidance Notes for Project Leaders  
(<http://darwin.defra.gov.uk/resources/reporting/>) -  
it is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

## Darwin project information

Project Reference	14-006
Project Title	Conservation of small vertebrates in Tsingy National Park, Madagascar
Host country(ies)	Madagascar
UK Contract Holder Institution	University of Aberdeen
UK Partner Institution(s)	
Host Country Partner Institution(s)	Programme Bemaraha, Association Nationale pour la Gestion des Airées Protégées
Darwin Grant Value	£161,100
Start/End dates of Project	1 October 2005 to 30 September 2008
Project Leader Name	Paul A. Racey
Project Website	<a href="http://www.madagasikara-voakajy.org/en/darwin_initiative">www.madagasikara-voakajy.org/en/darwin_initiative</a> <a href="http://www.madagasikara-voakajy.org/en/bemaraha_tsingy">www.madagasikara-voakajy.org/en/bemaraha_tsingy</a>
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## 1 Project Background

The Tsingy Bemaraha National Park has impressive levels of endemism, even within the context of Madagascar's unique biodiversity. The University of Aberdeen, and its nascent Malagasy partner association - Madagasikara Voakajy, were approached by the Director of the park to provide capacity building for key personnel and to undertake priority biological surveys. The project succeeded in providing advanced training to park personnel, as well as to Malagasy students. This was complimented by an environmental education initiative that focussed on informing children about the park's endemic species. Monitoring methods for priority species are now being revised based on project recommendations.



Map of Tsingy Bemaraha National Park

## 2 Project support to the Convention on Biological Diversity (CBD)

This project succeeded in raising the capacity of the primary host country partner to conserve and monitor biodiversity as well as improving ecotourism, in addition to benefitting two other Malagasy organisations. Accredited GIS training courses were completed by seven key personnel from the conservation management team in the park. This has enabled the integration of the existing equipment (e.g. GPS, computers) with data storage and map drawing. The tourist guides in the park were trained in field identification of small vertebrates as well as receiving advanced language courses. This capacity building was supported by the provision of books, CDs, cassettes to the personnel and posters to the park. Malagasy students from two universities received training in biological field techniques and sponsorship for their masters' theses. Key staff from a Malagasy association - Madagasikara Voakajy that was created during the first year (partly supported by a Darwin Follow-up), received a unique opportunity to gain experience and develop their careers. Madagasikara Voakajy has expanded considerably since 2005, mainly because of the foundation provided by this Darwin project.

There was no direct link between this project and CMS or CITES. However, this project has resulted in a closer working relationship between the University of Antananarivo and Madagasikara Voakajy. The latter organisation is the CITES Scientific (Animals) Authority for Madagascar and the former is building its reputation as a provider of conservation-relevant information on herpetofauna. In building the capacity of Madagasikara Voakajy, and supporting staff and students of the Department of Animal Biology, University of Antananarivo, this project has built the capacity of Malagasy scientists to contribute to the science-based decision making at CITES. In particular, the experience gained during this project on endemic forest chameleons has enabled Malagasy scientists to obtain new funding that deals directly with CITES.

Madagascar's CBD Focal Point changed during the lifetime of this project and this post is now held by Mrs. Laurette Rasoavahiny, who is the head of the government's protected area department within the Ministry of the Environment, Forests and Tourism. After each field mission, including environmental education and research visits, the host country partner submitted a report to Mrs. Rasoavahiny's department. At the end of the project, copies of publications, final reports and the host country partner's annual report were also sent to the CBD Focal Point, as well as to the Director of Madagascar National Parks and the Minister of the Environment, Forest and Tourism.

### **3 Project Partnerships**

The University of Aberdeen (UA) worked with four main partners during this project:

1. Association Nationale pour la Gestion des Airées Protégées (ANGAP), which is now called Madagascar National Parks

This project was based on a request from ANGAP to the UA for assistance in training staff and improving monitoring protocols. The UA stationed a post-doctoral researcher in Madagascar for 11 months of the year, based in Antananarivo, the capital city. The personnel from Tsingy Bemaraha National Park were based mainly in offices at Bekopaka and Antsalova, but some made regular visits to the ANGAP head-quarters in Antananarivo. Annual work plans were discussed with the UA representative and the park director, before detailed work schedules were developed by Madagasikara Voakajy and students from Malagasy universities. All activities were requested by the host country partner. There was no formal MOU established for the project but the work was undertaken under a protocol of collaboration between the UA, ANGAP and the University of Antananarivo. This partnership faced a major challenge when the European Union ceased its funding for the park and a series of redundancies followed. This occurred simultaneously with Air Madagascar's decision to withdraw its regular flight service to Antsalova, making transport to and from the park in the wet season all but impossible.

2. Department of Animal Biology (DBA), University of Antananarivo

The project trained and supervised two Malagasy masters students from this university department. The main strength of this partnership is the close relationship between UA staff, Madagasikara Voakajy staff and the lectures in the university. A recurring difficulty is with the DEA (= Masters) programme at DBA in that it takes an average of four years between completing field studies and the final oral defence. There was no formal MOU established for the project but the work was undertaken under a protocol of collaboration between the UA, ANGAP and the University of Antananarivo

3. Department of Biological Sciences, University of Toliara

The project trained and supervised two Malagasy masters students from this university department. There was no formal MOU established for the project but the work was undertaken under a protocol of collaboration between the UA and the University of Toliara. A major strength of this partnership during the project was the calibre and self-motivation of the two students, both of whom completed their theses before September 2008. Furthermore, one of these was later recruited by Madagasikara Voakajy as a conservation assistant with responsibility for chameleons.

#### 4. Madagasikara Voakajy (MV)

This organisation was created in 2005 by UA staff and DBA students to provide a foundation and career based for promising Malagasy biologists to conserve biodiversity. At its creation, and to this day, the organisation relies heavily on expertise that was developed during previous Darwin projects. Over the course of three years (October 2005 to September 2008) MV has steadily grown and now employs 10 Malagasy scientists full-time (nine of whom received initial training and Diplome Etude d'Approfondies [DEA] sponsorship from previous Darwin projects). The UA post-doctoral researcher directed the creation of this organisation and assisted in the development of a 5-year and 10-year vision document that maps out post creation and organisation growth, as well as the appointment of a Malagasy Executive Director. Senior Malagasy staff from MV had a close working relationship with UA personnel.

## 4 Project Achievements

### 4.1 Impact: achievement of positive impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

As in many parts of Madagascar the main threat to the forests in Bemaraha come from rural people who live around the park and who require wood and other forest products. The national park team implemented the protected areas code which prohibits unauthorised entry into, or use of, the biodiversity resources in the park by local people. A key management aim therefore is to ensure that the peripheral zones of the park, which can be exploited, are used in a sustainable way and that local communities are aware of the importance of the biodiversity. This latter point is critical to obtaining and maintaining local support for forest and animal conservation. The Melaky Region is one of the poorest and isolated parts of Madagascar; it has no road access during the wet season and there are very few towns. This project worked with children and teachers in Bekopaka and Antsalova towns, in schools there suffered from chronic shortages of teaching materials. Working with the Ministry of Education and the host country partner we organised successive events in primary schools that culminated in a week-long education initiative in the run-up to World Environment Day 2008; 202 school children (all schools in each town) participated in the initiative that consisted of messages based on a booklet that was created by the Darwin project. This contained information on the important endemic species in the area and the children were then given water-color paint sets and invited to create biodiversity masks for World Environment Day. This part of the project had a hugely positive influence because it (i) supported the host country to justify the rules that govern use of the forest (ii) helped children and teachers understand about the unique biodiversity around them (iii) provided the opportunity to raise the profile of biodiversity with visiting senior government officials (iv) has left 250 booklets on biodiversity in the Malagasy language in 7 primary schools.

This project was set within the framework of Madagascar's National Strategy for the Sustainable Management of Biodiversity, and in particular is aligned with Theme 1 Biodiversity Conservation (Objective 1: Ecosystem Conservation), Theme 2 Sustainable Use of Biodiversity (Objective 3: Ecotourism Development) and Theme 3 Reduced Pressures on Biodiversity (Objective 1: Encouraging wise-use of biodiversity at local level). Furthermore, this project contributes to the following strategic objectives set out in the plan: Capacity building, Improved monitoring.

As stated in the preceding paragraph, ecotourism is a major component of sustainable use of biodiversity in Madagascar. Although Madagascar receives relatively few ecotourists, the numbers have steadily increased annually in the last decade and Bemaraha National Park is an impressive fourth place in the list despite being closed for five months of the year. Providing tourists with an enjoyable and informative visit to the park is therefore a key priority because it brings in much needed funds for conservation and community development. This project invested significant resources in raising the capacity of the tour guides in the park and it is hoped that this will confer a long-term benefit to the sustainable use of biodiversity.

## 4.2 Outcomes: achievement of the project purpose and outcomes

Within its original project application there were five components to the overall purpose. Two of these focussed on capacity building, of Malagasy students and park personnel, and were fully achieved. Although two students from DBA are undergoing the final revisions and corrections for their theses, all four received at least three months field training followed by one-to-one supervision from UA and/or MV staff. In addition, the personnel of other Malagasy organisations received advanced professional training and on-the-job experience. The impact of these outcomes is more difficult to describe so soon after project completion. Clear impacts however can be seen in the confidence and careers of students who obtained their DEA, and one has already found employment. There was all-round positive feedback on the training programme for tourist guides but its impact is difficult to measure. The project has contributed in other ways to developing sustainable tourism, which was part of the original purpose, through recommending sensitive areas to remain off the tourist trails and producing colour posters for the park's new visitor centre. The proposed new monitoring programme has been presented to the park and will be implemented in the coming wet season. This will benefit biodiversity because current monitoring methods are not suitable for detecting changes in population size over time. Hundreds of school children participated in a Darwin education initiative, held in the week preceding World Environment Day 2008, and that became the flagship event for the Melaky Region. These children, and their teachers, gained new knowledge and insight into their local biodiversity.

## 4.3 Outputs (and activities)

We achieved all outputs, partially or completely.

### Output 1 New monitoring programme

This output has only been partially achieved because of external problems related to the loss of European Funding (anticipated) to the park and regular flights from Antananarivo to Antsalova (unexpected). Nevertheless, the main components of this output have been completed; field data were collected, analysed and published and regular updates between ANGAP and UA. The director and monitoring office of Bemaraha National Park have agreed to revise their protocol in line with our recommendations. There is no requirement for additional training for the park staff, or more resources, because the recommendations are based on the resources that are available.

### Output 2 Action plan for small vertebrates

This has not been implemented in the form expressed during the original publication because of ongoing taxonomic developments. Conservation action for the park's chameleons is outlined in a publication in *Oryx* and a report in French to ANGAP (copy sent to CBD, Madagascar). An IUCN Red List assessment for an endemic park chameleon (*Brookesia exarmata*) was sent to the Zoological Society of London who were compiling a sample of Malagasy reptiles in a project to develop the Red List Index for the Millennium Development Goals. A similar assessment has been completed for *Brookesia perarmata* by the project team. The chameleon *Furcifer nicosiai* is now known, because of this Darwin project and other funding levered during the project, to be endemic to the park. This fact, in addition to a series of new species that have been described or discovered in the park, has caused the postponement of a document that sets out the diversity of the park. The park director has agreed to wait until the most recent species have been formally described by herpetologists based overseas, and this is expected in 2009. A publication summarizing the most recent herpetofaunal surveys was written by project staff in collaboration with German biologists and Malagasy students from the University of Antananarivo. This was submitted to *Herpetofaunal Conservation and Biology* and is currently under review. The biodiversity statement document for the park will also update the IUCN Red List conservation status for the park's mammals. UA and MV staff managed the compilation and assessment of data for Malagasy bats. A key factor regarding these improvements is that they have been sanctioned, and mostly requested, by the host country partners.

### Output 3 Informed and trained guides

This was achieved in full and we held advanced training courses on birds, reptiles and bats that consisted of field and class exercises and led by Malagasy specialists. Complimentary courses were also provided to the guides to improve their English and French language skills in addition to raising their awareness about certain etiquette that visitors from overseas might expect from them. We encountered no major problems with this aspect of the project. However, UA and DBA recommended that two of the guides who excelled during the bird training should receive additional support, in the same manner as specialist guide in other protected areas in Madagascar. However, this suggestion was not accepted because the park prefers to offer equal opportunities to all its guides.

#### Output 4 Malagasy students trained

This project sponsored four Malagasy students, two of whom have completed their DEAs at University of Toliara and two others who are in the final stages at the University of Antananarivo. These students received training in the field and close supervision during analysis and thesis preparation. There were no major problems and although frustrating, the time taken by University of Antananarivo students on this project to complete their DEA, is normal in the department concerned.

#### **4.4 Project standard measures and publications**

See Annexes 4 and 5.

#### **4.5 Technical and Scientific achievements and co-operation**

The research component of this project was truly collaborative, and included researchers from UA, DBA as well as other overseas institutions. The majority of the scientists and students were Malagasy, the only exception being personnel from UA and a collaborative project with German herpetologists. Research findings are being processed and written-up, but some have already been published in peer-reviewed journals or used to update the IUCN Red List database.

#### **4.6 Capacity building**

Capacity was built and nurtured during this project and the host country partners were supported in a number of different ways.

1. Association Nationale pour la Gestion des Airées Protégées (ANGAP)

Capacity building focused on training the personnel of the national park to help them provide an improved service to tourists and to better manage and protect small vertebrates. The training programme was requested by ANGAP and the Darwin project financed the training courses.

2. Malagasy universities

Capacity building was provided by training graduate students as part of their DEA degrees. The main form of support was through providing the funds to conduct fieldwork, the resources in Antananarivo to facilitate thesis preparation and the presence of the UA post-doctoral researcher in Madagascar as a supervisor.

3. Madagasikara Voakajy (MV)

The organisation benefitted hugely from this project. Its senior Malagasy staff were employed for three years and used this time to develop new projects to maintain their contracts and develop new initiatives. Darwin funding was also crucial in supporting key administrative and logistical support services. The combination of improving its financing, physical resources and improving its human resources helped MV develop between 2005 and 2008. It now has an expanded herpetological conservation team and is getting involved in more challenging projects. It also feels able to offer its self as a potential host country partner in future Darwin applications. It is not easy to create an organisation from scratch in Madagascar, and is even more difficult to maintain it. The Darwin Initiative has provided crucial capacity building resources to MV and significantly assisted the development of the organisation and its personnel.

The UK partner developed its own capacity during this project, especially through its new collaboration with MV. On previous Darwin projects run by UA in Madagascar, the host country partner is rarely involved on a day two day basis and most project activities are undertaken by students on temporary assistants. With the creation of MV in 2005, the UA had an ambitious and effective host country partner which greatly assisted in the implementation of the project and liaison between ANGAP and the universities.

#### **4.7 Sustainability and Legacy**

The most durable achievement has been the elevation of Malagasy scientists and educators to a point where they feel more confident and better equipped to conserve biodiversity. There is very low turnover of guides in the national park and we are confident that the effort and resources expended on improving their natural history knowledge and language skills will endure for many years to come.

Project personnel were assimilated into Madagasikara Voakajy during 2005. These people are now engaged in new projects, many of which would never materialised without this Darwin grant. Similarly, the physical resources that were transferred are being used to support Madagasikara Voakajy and the Darwin legacy.

The partners were in regular contact before and during the project and this will not change after its completion. ANGAP is undergoing a structural reorganisation and close contact will be retained with the personnel from Bemaraha during this process. Madagasikara Voakajy has a new project, just to the south-west of the park, and envisages collaborating with ANGAP about expanding its ecotourism to include a new site where MV and the Durrell Conservation Wildlife Trust are working together. MV and DBA will continue to support ANGAP in Bemaraha with respect to biodiversity conservation. Madagasikara Voakajy is developing closer links with DBA in relation to CITES and had taken on two further DEA students from this department. Furthermore, MV is now offering six month professional training placements to students from this department.

### **5 Lessons learned, dissemination and communication**

Key lessons that we have drawn from this project is that it is more difficult to raise additional support for a single site compare to our previous Darwin projects that were taxon-focused and included a number of study areas across the island. Funding priorities within Madagascar by international donors at the time of our project focussed on the creation of new protected areas rather than supporting the existing network of parks and reserves. On the plus side, by working in a single site, the impact of the project is more concentrated and the Darwin name better known. In order for the legacy to be maintained it was necessary for key project personnel to devote considerable time in the last two years to raising additional funds. Happily, this was successfully achieved but resulted in some slippage regarding the provision of materials to ANGAP. From the point of view of the staff from the national park, this is not a major problem because Madagasikara Voakajy appears to be well established and they are confident not only of future liaison over the legacy of this project but also the development of new initiatives.

Dissemination has been targeted towards individuals and organisations with an interest in the site or certain taxa. This has primarily consisted of the park management team and conservation scientists. A more general summary of the achievements of the project are presented in the annual Madagasikara Voakajy report that is circulated to interested parties in Madagascar and elsewhere.

#### **5.1 Darwin identity**

We made every effort to promote the Darwin brand during this project. Darwin is acknowledged on all project publications and the logo positioned prominently on reports and training documents, and also on student theses if permitted by the university. In year three we held a week long Darwin environmental education event and the logo was prominent on all materials prepared for this occasion. This was a major event in the Melaky Region and attended by senior government officials. The Darwin logo was prominently displayed on a large banner, as well as prizes (trophies) that were awarded for basketball, football and cycling competitions.

These prizes were supplemented by Darwin badges and pens supplied by DEFRA to the host country partner.

There remains a low understanding about the Darwin Initiative in Madagascar and valuable opportunities to promote its work were lost when the British Embassy in Antananarivo was closed in 2005. During the project, one of the Madagasikara Voakajy staff members was awarded a Darwin Scholarship to study for an MSc in the University of East Anglia.

## **6 Monitoring and evaluation**

The Darwin logframe has undergone a number of changes in style since the original application was submitted in 2004. There seven original outputs in the 2004 application to DEFRA and nine associated indicators.

### 1. Ecological monitoring programme

We collected a large amount of baseline data on both the presence and absence, as well abundance, density and habitat use of priority taxa. Lower level progress indicators were not identified in the original logframe so progress made towards this output was not adequately captured. The final indicator, of new protocols implemented, was useful however as it highlights the slippage regarding this part of the project.

### 2. Action plans for small vertebrates

The data that we collected in the field were used to synthesize conservation action documents for key species, although not in the format that was originally intended. Conservation publications were cited as indicators and this seems reasonable with hindsight.

### 3. Informed and trained guides

Guides were assessed on their knowledge of the training subjects before each capacity building events and the general improvements subsequently were used as measure of assessing the success of the training. Ideally, the guides should receive regular training and assessment but this is not part of the current system used by ANGAP.

### 4. Trained Malagasy students

Field and office-based training was given to students who received sponsorship to complete their DEA thesis at a Malagasy university. Evaluation of this occurred throughout the project by UA and DBA staff, with representatives from both institutions making field visits with the students. Indicators in the original application only reflected the end point (i.e. thesis submission) and a new system has been developed by host country partners and UA to monitor the progress of each stage of the training (i.e. proposal, design, preliminary report, first draft, final draft and public defence).

### 5. Education programme for guides

This overlaps with #2 above

### 6. Endemic reptile key

A guide book to the reptiles and amphibians of Madagascar was produced in the Malagasy language during 2007 - we therefore produced a booklet on the endemic vertebrates of the park, with children as the target audience. We also produced a short booklet in French for guides and park staff on the key herpetofauna in the park.

### 7. GIS training for ANGAP

This was achieved through an accredited course in Antananarivo and indicators were adequately identified in the original application.

### 8. Media coverage

The national and local media covered various aspects of this project but it was not always possible to obtain copies of the radio broadcasts.

### 9. Project website



This was superseded by the Madagasikara Voakajy website in which pages are devoted to the Darwin Initiative and this project. Future indicators in this respect should include the number of updates on project pages per year.

There was no internal or external evaluation of this project although all Darwin projects (past and present) were evaluated by a DEFRA-appointed consultation as part of the CBD Island Biodiversity Theme. During the evaluation, representatives from UA, DBD and ANGAP were all interviewed in person. After completion, UA received very positive feedback but was recommended to develop a closer link with government. It is not easy to develop closer links with government *per se* in Madagascar, but rather this is a relationship that builds over time. As a new organization and a small one compared to international NGOs, Madagasikara Voakajy has taken a few years to become known in Antananarivo. Its profile within government is now much higher than it was a few years ago mainly because of projects to create new protected areas during which its staff and ministry personnel have worked closely. Darwin projects would benefit from more evaluations.

### 6.1 Actions taken in response to annual report reviews

There were no major issues raised during the annual reviews. However, attention was drawn early on the role of the University of Antananarivo and the fate of Darwin Trainees, post-project. Two professors from the University of Antananarivo accompanied us in the field, to supervise students and train guides. The issue of what happens to Darwin Trainees at project-end is very important. Madagasikara Voakajy was created to provide previous Darwin Trainees with a career base and was able to exploit a niche in the environment sector in the country. It is not feasible to expect all students who receive training to also obtain employment in the host country partners but it is pleasing to note that Raphali Antsimanarilafy conducted his field study in 2006 in Bemaraha, obtained his DEA in 2007 and was then recruited by Madagasikara Voakajy in September 2008.

## 7 Finance and administration

### 7.1 Project expenditure

<i>Original budget items</i>	<i>Requested funds</i>	<i>Expenditure</i>
Salaries (Aberdeen)		
Salaries (Madagascar)		
Office running costs		
Travel & subsistence		
Printing		
Conferences etc.		
Capital equipment		
Training courses		
Fieldwork supplies		
Landrover parts/tyres		
Audit cost		

#### **TOTAL**

There are some differences in the expenditure compared to the original proposal. As explained in annual reports, the additional funds that were levered to support the attendance at international conferences enabled us to cover the rising living costs and fuel costs. Significant costs associated with Malagasy personnel, paid as per diems for field missions, are expressed under *Travel and Subsistence*, thus explaining the under-spend in salaries.

## **7.2 Additional funds or in-kind contributions secured**

The main host country partners, ANGAP, provided £1,000 towards the costs of producing six colour posters on the fauna of Bemaraha National Park for its new visitor centre. We obtained additional funding for Christian Randrianantoandro's participation in the 2007 Society for Conservation Biology conference in South Africa where he presented a poster on results from this project. The majority of the additional funding that we raised during the project was for an expanded chameleon conservation initiative in western Madagascar. Because the original plan was to complete this project in three years, it felt more appropriate to develop new funding opportunities elsewhere in Madagascar, using the expertise that was created and nurtured during the project.

## **7.3 Value of DI funding**

DI funding was key to basing a UA post-doctoral research in Madagasikara Voakajy to manage the project and oversee the creation of the new organisation. Before Madagasikara Voakajy existed, the previous group of Malagasy biologists consisted entirely of bat specialists and it was therefore considered advisable to extend the new organisation's remit. The availability of DI funding allowed Madagasikara Voakajy to quickly recruit two herpetologists – something that would have been very difficult to have done otherwise. The success of Madagasikara Voakajy since 2005, across all of its projects, is due in large part to DI funding. Similarly, for ANGAP, DI funding provided resources and opportunities for which they had a pressing need but not budget. DI funding was probably less crucial to the Malagasy universities, but in contrast was of major importance to the four students from these institutions who received the sponsorship.

## Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements
<p><b>Goal:</b> To draw on expertise relevant to biodiversity to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</p> <ul style="list-style-type: none"> <li>• The conservation of biological diversity,</li> <li>• The sustainable use of its components, and</li> <li>• The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</li> </ul>		<p>Improved capacity of park's personnel to monitor, map and conserve priority species; better services provided to ecotourists</p>
<p><b>Purpose</b> To conserve the small vertebrates of Tsingy Bemaraha National Park by training Malagasy students and guides in fieldwork surveys, leading to the implementation of a new monitoring program, prioritised conservation action and sustainable tourism activities</p>	<p>Ecological monitoring programme tested and running by yr 3</p> <p>Levels of tourism controlled in sensitive habitats/caves by yr 2</p> <p>Improved ability of tour guides to educate park visitors</p> <p>Most threatened species identified (yr 2) and conservation action implemented (yr 3)</p>	<p>Ecological monitoring programme for chameleons and bats tested and running for the latter group.</p> <p>Tourism plans at high priority cave shelved in light of recommendations from the project</p> <p>Significant improvement in tour guides ability to educate park visitors</p> <p>Increased capacity of park staff to handle GPS data</p> <p>Results from this project, and from others, are leading to the discovery of new endemic species in the park and being incorporated into a revised species action plan for the park.</p>
<p><b>Output 1.</b> Ecological monitoring programme implemented</p>	<p>Data collection</p> <p>Monitoring manual</p> <p>Papers (4) submitted</p>	
<p>Activity 1.1 Collection of data on chameleon abundance with ANGAP and assessment of existing monitoring methods</p>		<p>Joint study trips through the project.</p> <p>Revision to existing monitoring presented to ANGAP. Two peer-reviewed papers published.</p>

Activity 1.2 Collection of data on bat occupancy in caves on tourist circuits		Joint monitoring visits to bat caves each year
Activity 1.3 Collection of data on rodent habitat use		Joint studies on habitat use of endemic rodents in two seasons.
<b>Output 2.</b> Action plans for small vertebrates	Action plans published	Conservation actions for chameleons outlined in publication and technical reports Conservation actions for other herpetofauna outlined in publication (submitted) and technical reports Updates prepared and submitted for use on the IUCN Red List.
Activity 2.1. see 1.2, 1.3, 1.4		
<b>Output 3 (and 5).</b> Informed & trained guides + education programme for guides	Attendance at training sessions and courses	
Activity 3.1 Guide training (fauna)		High attendance at training sessions during 2006 and 2007 by guides and park staff. Evident improvement during the week long courses on reptiles, birds and bats.
Activity 3.2 Guide training (languages)		High attendance at training sessions during 2006 and 2007 by guides and park staff. Evident improvement during the week long courses on speaking English and French.
<b>Output 4.</b> Malagasy students trained	Students graduate Malagasy supervisors visit Attendance at training sessions and courses	

Activity 4.1 Student training		Four students from Malagasy universities received training and sponsorship. Two supervisors made field visits to their student. Two students have graduated.
Activity 4.2 GIS and GPS training courses		Students were trained in GPS and GIS – all participants completed the accredited courses and received certificates.
<b>Output 6. Endemic reptile key</b>		
Activity 6.1 Data and photo collection		Natural history information collected and distribution maps produced. Additional photos were obtained from international specialists.
Activity 6.2 Booklet production		Two different booklets produced, one in Malagasy for schools and one in French for guides.
<b>Output 7. ANGAP senior conservation staff trained in GIS and data analysis</b>	Attendance at training sessions and courses	
Activity 7.1 GIS and GPS training courses		Guides were trained in GPS and GIS – all participants completed the accredited courses and received certificates.
<b>Output 8. Media coverage</b>	TV and radio broadcasts	Project staff completed a number of interviews for the local radio station ( <i>Radio Tsingy</i> )
<b>Output 9.</b>	Project website	Information about the project is featured on the Madagasikara Voakajy website.

## Annex 2 Project's final logframe, including criteria and indicators [from original log framework]

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"> <li>the conservation of biological diversity,</li> <li>the sustainable use of its components, and</li> <li>the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</li> </ul>			
<p><b>Purpose</b></p> <p>To conserve the small vertebrates of Tsingy Bemaraha National Park by training Malagasy students and guides in fieldwork surveys, leading to the implementation of a new monitoring program, prioritised conservation action and sustainable tourism activities</p>	<p>Ecological monitoring programme tested and running by yr 3</p> <p>Levels of tourism controlled in sensitive habitats/caves by yr 2</p> <p>Improved ability of tour guides to educate park visitors</p> <p>Most threatened species identified (yr 2) and conservation action implemented (yr 3)</p>	<p>Field surveys, data collection and student theses</p> <p>Tourist questionnaires</p> <p>Signed attendance sheets during on-site training courses</p> <p>Posters and booklets disseminated</p> <p>Priority species identified and subject to field studies</p> <p>Involvement of Malagasy students and their supervisors</p>	<p>TBNP continues to receive in-country funds to support core-activities</p> <p>Guides attend classes and field workshops</p> <p>Park staff are made available</p> <p>Availability of students and teachers</p>
<p><b>Outputs</b></p> <p>1 Ecological monitoring programme implemented</p> <p>2 Action plans for small vertebrates</p> <p>3 Informed &amp; trained guides (18)</p> <p>4 Malagasy students</p>	<p>1 Data collection</p> <p>2 Monitoring manual</p> <p>3 Papers (4) submitted</p> <p>4 Action plans published</p> <p>5 Students graduate</p> <p>6 Guide book</p>	<p>E-copies of certificates, publications, reports, photographs, theses made available to DEFRA.</p>	<p>Park management receptive to recommendations and make appropriate improvements to undertake interventions as required</p>

<p>trained</p> <p>5 Education programme for guides</p> <p>6 Simple key to endemic reptiles</p> <p>7 ANGAP senior conservation staff trained in GIS and data analysis</p> <p>8 Media coverage</p> <p>9 Project website</p>	<p>published</p> <p>7 Malagasy supervisors visit</p> <p>8 Attendance at training sessions and courses</p> <p>9 TV and radio broadcasts</p>	
<p><b>Activities</b></p> <p>Tour guide education programme</p> <p>ANGAP conservation staff and Malagasy student training programme</p> <p>Field test followed by implementation of monitoring protocol</p> <p>Surveys of two other Tsingy sites</p> <p>Annual workshops</p> <p>Publicity and dissemination</p> <p><b>Activity Milestones (Summary of Project Implementation Timetable)</b></p> <p>Yr 1: Herpetofauna surveys, cave surveys, guide training courses (language, reptiles and bats), four Malagasy students recruited to join the project</p> <p>Yr 2: Survey of Belitsaka forest outside of the park, endemic rodent study, student graduation, GIS and GPS training for guides and students, guide training courses (languages and birds), poster production, dissemination of the results at an international conference, scientific paper published</p> <p>Yr 3: Production of booklets, student graduation, scientific paper published, prominent environmental education initiative, reports disseminated within Madagascar</p>		

## Annex 3 Project contribution to Articles under the CBD

### Project Contribution to Articles under the Convention on Biological Diversity

Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use		Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	20	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	20	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation		Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity		Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	30	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	30	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.



<b>Article No./Title</b>	<b>Project %</b>	<b>Article Description</b>
16. Access to and Transfer of Technology		Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information		Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Other Contribution		Smaller contributions (eg of 5%) or less should be summed and included here.
Total %	100%	Check % = total 100

## Annex 4 Standard Measures

Code	Description	Totals (plus additional detail as required)
<b>Training Measures</b>		
1a	Number of people to submit PhD thesis	1 Radosoa Andrianaivoarivelo is a PhD candidate at the University of Antananarivo and staff member at Madagasikara Voakajy.
2	Number of Masters qualifications obtained	2 Diplôme d'Etude Approfondies
3	Number of other qualifications obtained	21 GIS (4+7) GPS (4) Questionnaire design (1) Computer skills (2) Web site/html (1) Pensions course for administrators (1) NGO financial management (1)
4c	Number of postgraduate students receiving training (not 1-3 above)	1 Radosoa Andrianaivoarivelo on genetic analysis of his fruit bat samples, collected at Bemaraha National Park and other sites, at Henry Doorly Zoo, Omaha, US.
4d	Number of training weeks for postgraduate students	48 Field work (8 weeks x 4 students) Analyses/writing (4 weeks x 4 students)
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification (i.e. not categories 1-4 above)	5 Malagasy biologists Christian Randrianantoandro, Hanta Julie Razafimanahaka, Andrinajoro Rakotoarivelo and Roma Randrianavelona Malagasy administrator Mhy
6a	Number of people receiving other forms of short-term education/training (i.e. not categories 1-5 above)	527 Tourist guides (19) National park staff (7) School teachers (19)

Code	Description	Totals (plus additional detail as required)
		School children (479) Education ministry staff (3)
6b	Number of training weeks not leading to formal qualification	744 Malagasy biologists (3 yrs x 4 people) Tourist guides (5 wks x 19 people) National park staff (5 wks x 5 people) School teachers (2 wks x 19 people)
7	Number of types of training materials produced for use by host country(s)	7 Modules for teaching in primary schools (3) Booklet on small vertebrates for use in primary schools (1) Bats, reptiles and birds for national park guides (3)
<b>Research Measures</b>		
8	Number of weeks spent by UK project staff on project work in host country(s)	Paul A. Racey (10 weeks) Richard K. B. Jenkins (88 weeks)
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	1 Chameleon plan for Bemaraha National Park
11a	Number of papers published or accepted for publication in peer reviewed journals	4 (+ 1 in review) Oryx (2008) Conservation Genetics (2008) Amphibian-Reptilia (2007) Madagascar Conservation and Development (accepted) Herpetological Conservation (review)
13b	Number of species reference collections enhanced and handed over to host country(s)	1 Department of Animal Biology, University of Antananarivo
<b>Dissemination Measures</b>		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	3 Work sessions with UK and host country partner personnel to discuss results and plan activities <sup>1</sup>
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project	2

<sup>1</sup>

<b>Code</b>	<b>Description</b>	<b>Totals (plus additional detail as required)</b>
	work will be presented/ disseminated.	Society of Conservation Biology, Annual Conference, 2007 Student Conference on Conservation Science, 2008
19c	Number of local radio interviews/features in host country (s)	4
<b>Physical Measures</b>		
20	Estimated value (£s) of physical assets handed over to host country(s)	£12,900 including a motorcycle, computers and small mammal traps
23	Value of additional resources raised for project	£36k Chameleon conservation CLP £17k Chameleon conservation CES £4k Chameleon conservation CI £8k Chameleon conservation CS £2k Ecotourism study VWF £6k Colour posters ANGAP £1k
<b>Other Measures used by the project and not currently including in DI standard measures</b>		
	Additional funding raised by UK partner support follow-on activities or new projects elsewhere that contribute to the legacy of this project	Madagasikara Voakajy IUCN SEPG (£46k) Maurice Laing Foundation (£19k) Rufford Small Grants (£10k) Conservation International (£50k) Wildlife Conservation Society (£11k) International Foundation for Science (£12k) University of Aberdeen IUCN Sir Peter Scott Fund (£11k) National Geographic Fund (£22k) Disney Wildlife Conservation Fund (£32k) British Ecological Society (£14k)

## Annex 5

## Annex 5 Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Journal*	Roost site characteristics of sympatric dwarf chameleons (genus <i>Brookesia</i> ) from western Madagascar. Randrianantoandro, J.C.; Randrianelona, R.; Antsimanarilafy, R. R., Elisoa; F.H., Rakotondravony, D.; Jenkins, R. K.B.	BRILL, Leiden.	<a href="http://www.ingentaconnect.com/content/brill/amre/2007/00000028/00000004/art00016">http://www.ingentaconnect.com/content/brill/amre/2007/00000028/00000004/art00016</a>	13.00
Journal*	Identifying important areas for the conservation of <i>Brookesia</i> dwarf chameleons in Tsingy Bemaraha National Park, Madagascar. Randrianantoandro, J.C.; Randrianelona, R.; Antsimanarilafy, R. R., Elisoa; F.H., Randrianasolo, M., Ravelomanantsoa, H., Rakotondravony, D.; Jenkins, R. K.B.	Cambridge University Press, Cambridge.	<a href="http://journals.cambridge.org/action/displayAbstract;jsessionid=87FA6B7EB7B7E74A94772A5601409002.tocmat1?fromPage=online&amp;id=2450744">http://journals.cambridge.org/action/displayAbstract;jsessionid=87FA6B7EB7B7E74A94772A5601409002.tocmat1?fromPage=online&amp;id=2450744</a>	14.00
Journal*	Andrianaivoarivelo, A. R., Shore, D. G., McGuire, S. M., Jenkins, R. K. B., Ramilijaona, O. R., Louis, E. E., Brennan, R. A.	Springerlink	<a href="http://www.springerlink.com/content/g0250768mu787t30/offerings/?p=ec78fb39f44945b5b715e3da6e8fb534&amp;pi=0">http://www.springerlink.com/content/g0250768mu787t30/offerings/?p=ec78fb39f44945b5b715e3da6e8fb534&amp;pi=0</a>	17.00

## Annex 6 Darwin Contacts

Ref No	14-006
Project Title	Conservation of small vertebrates in Tsingy National Park, Madagascar
<b>UK Leader Details</b>	
Name	Paul A. Racey
Role within Darwin Project	Leader based in UK
Address	School of Biological Sciences, University of Aberdeen, Aberdeen, ABDN 2TZ
Phone	
Fax	
Email	
<b>Other UK Contact (if relevant)</b>	
Name	Richard K. B. Jenkins
Role within Darwin Project	Post-doctoral biologist based in Madagascar during the project
Address	60, Heol Goffa, Llanelli, UK
Phone	
Fax	
Email	
<b>Partner 1</b>	
Name	Christian Randrianantoandro
Organisation	Madagasikara Voakajy
Role within Darwin Project	Managed herpetological surveys
Address	B. P. 5181, Antananarivo, Madagascar
Fax	
Email	
<b>Partner 2</b>	
Name	Hery Lala Ravelomanantsoa
Organisation	ANGAP
Role within Darwin Project	Director of Bemaraha National Park, primary host country partner
Address	Ambatobe, Antananarivo, Madagascar
Fax	
Email	
<b>Partner 3</b>	
Name	Daniel Rakotondravony
Organisation	Department of Animal Biology, University of Antananarivo

Role within Darwin Project	Student supervisor
Address	B. P. 906, Department of Animal Biology, Faculty of Science, University of Antananarivo, Antananarivo, Madagascar
Fax	
Email	