



Darwin Initiative for the Survival of Species

Annual Report

1. Darwin Project Information

Project Ref. Number	13/018
Project Title	<i>Building Genetic Forensic Capacity to Reduce South Africa's Illegal Trade</i>
Country(ies)	<i>South Africa</i>
UK Contractor	<i>University of Sheffield</i>
Partner Organisation(s)	<i>University of KwaZulu-Natal</i>
Darwin Grant Value	<i>Total Amount £216,581 Year 1: £85,581</i>
Start/End dates	<i>April 2004 – March 2007</i>
Reporting period (1 Apr 200x to 31 Mar 200y) and report number (1,2,3..)	<i>1 Apr 2004 – 31 Mar 2005 Annual report no. 1</i>
Project website	<i>(not yet available)</i>
Author(s), date	<i>Terry Burke, Tiawanna Taylor, April, 2005</i>

2. Project Background

This project represents a collaboration between the University of Sheffield and University of KwaZulu-Natal in South Africa and will build capacity within South Africa to address illegal wildlife trade issues through the use of DNA fingerprinting. In the absence of conclusive evidence, it has been difficult to prosecute perpetrators of illegal trade in wildlife. Traders typically rely on being able to claim that they have bred in captivity birds that were illegally removed from the wild, in order to legitimise these birds for profitable sale. DNA fingerprinting provides the necessary evidence and can prove conclusively whether birds have, or have not, been captive-bred. The availability of a reliable method will provide authorities with the incentive and ability to investigate suspected thefts. Once this facility is made available, an awareness of these techniques will deter this trade, plus media interest in this type of work will lead to a wider awareness of wildlife trade in general.

3. Project Purpose and Outputs

- The purpose of the project is to assist the conservation of wildlife by building institutional capacity for wildlife forensic DNA analysis. The project will initially concentrate on two species currently threatened by illegal trade (Cape Parrot and Blue Crane). South African MSc students are being trained to develop microsatellite markers and to undertake the investigative research required to characterise the genetic markers for forensic use. Permanent staff of the Molecular Biology Unit at the University of KwaZulu-Natal and the students will be trained in the techniques required in genetic forensic analysis, including establishing an unbroken chain of evidence, producing and analysing forensic profiles, and writing evidence statements for the authorities. Procedures will be drawn up in collaboration with appropriate authorities in South Africa (with the assistance of UK expertise) to provide protocols and guidelines. The presence of such a high profile technique will raise awareness of the illegal trade and, as seen elsewhere (United Kingdom and Australia), should prove a deterrent, reducing such activities.
- It has not been necessary to modify the outputs and plan over the last year.

4. Progress

- This project came about through the combined interests of Professor Terry Burke (TAB; University of Sheffield), Professor Mike Perrin (MRP; University of KwaZulu-Natal) and Dr Tiawanna Taylor (TT; subsequently employed to coordinate the project by the University of KwaZulu-Natal) in avian conservation, and our knowledge that illegal trade was impacting on the conservation of the Blue Crane and Cape Parrot, and that obtaining the conclusive evidence required for the authorities to prosecute offenders was difficult. TAB and TT have experience in the appropriate molecular techniques and the use of forensics to provide a tool that the authorities could utilise, and we recognised that training and capacity building at UKZN could provide such a service in South Africa.
- The project began later than originally planned, due to the later than expected announcement of funding, in May 2004. This inevitably led to a slow start, exacerbated by delays in signing the contracts between the two Universities and the subsequent transfer of funds to UKZN. Consequently, Dr Taylor in particular spent significant time coordinating the administration of the project and chasing up and progressing these matters. Delays in receiving funding meant that Dr Taylor had to postpone personal visits to the contacts in S Africa required for developing the protocols. However, the project is now well on track and we fully expect to make up for the initial delays and achieve the planned milestones during the second year.
- Contacts have been made with the appropriate government and NGO authorities in SA. These are to be expanded further over the next year and guidelines developed. These have been made by phone and email and will be followed up where appropriate in person in the coming year.
- Contacts have been made with relevant researchers and authorities in the UK from which additional information will be obtained to support the documentation to be developed in South Africa relating specifically to wildlife forensics. Visits to relevant people will be made during Dr Taylor's visit to the UK in April / May 2005.
- Two South African students commenced their MSc studies in February 2005 and are currently undergoing training and research at TAB's molecular ecology lab at the University of Sheffield. They are learning the skills and techniques required for microsatellite development and analysis and collaborating with other researchers working in the same field.

- Delays: As detailed in the half-year report, there were some unexpected administrative delays which arose due to the merger of the University of Natal with the University of Durban Westville in January 2004. This led to a delay in an agreement being drawn up between the University of Sheffield and University of KwaZulu-Natal in order that funds could begin to be transferred. This situation has now been resolved.
- One source of some matched funding: As detailed in the proposal, funding for a third South African MSc student plus equipment and consumables was sought and awarded by NRF (South African government). However, although originally informed by UKZN research office that, as an honorary research fellow at UKZN, Dr Taylor was eligible to apply for external funding this later turned out not to be the case. Dr Taylor is awaiting further developments as there appears to be some internal variation with regard to policy on this matter.
- No significant changes or enhancements have as yet been made to the project as it is still in its initial stages.

Timetable for 2005 – 2006

<i>April 2005 – August 2005</i>	<i>Students continue research and training at University of Sheffield developing microsattellites for the Cape Parrot and Blue Crane</i>
<i>August 2005 – Feb 2006</i>	<i>Students optimise microsattellites prior to analysis.</i>
<i>April 2005 – May 2005</i>	<i>Dr Taylor travels to UK for consultation with UK experts on developing guidelines for forensic fingerprinting</i>
<i>June 2005 – Oct 2005</i>	<i>Dr Taylor visits relevant people and organisations in SA for consultation on developing guidelines for forensic fingerprinting suited to South Africa’s legal requirements to draw up guidelines</i>
<i>Nov 2005 – March 2006</i>	<i>Develop draft forensic guidelines to suit SA legislation, send to SA and UK collaborators for comments.</i>
<i>Oct 2005 – Sept 2006</i>	<i>MSc students analysing microsattelite characteristics and creating genetic database of individuals.</i>
<i>Nov 2005 – Sept 2006</i>	<i>Talks and workshops with authorities and other stakeholders to disseminate information begin.</i>
<i>Sept 2005 – Nov 2006</i>	<i>Authorities asked to confirm that techniques used and laboratory standards are appropriate for forensic analysis in South Africa.</i>
<i>Dec 2005 – Jan 2006</i>	<i>Guidelines for the authorities and manuals for the field staff concerning collecting DNA evidence and its use in forensic investigations published and disseminated.</i>
<i>Dec 2005 – Jan 2006</i>	<i>Draft protocols for forensic laboratory techniques developed.</i>
<i>Mar 2006</i>	<i>Workshops and talks begin in the applications of DNA forensics to authorities and field staff.</i>

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

- n/a

6. Partnerships

Collaboration between UK and host country partner(s) over the last year – positive and negative aspects

- Advantages include that the MSc students are collaborating with a laboratory that contains much experience in this field.
- There are occasional difficulties in turnaround times with invoicing etc – but these have occurred within each organisation, as well as between, and are probably a characteristic of large organisations.
- Funds need to be converted between UK Pounds and SA Rand, and the exchange rate may alter over time, including between the time the invoice is raised and paid. However, this has to date not caused a serious problem.
- The partner organisation, University of KwaZulu-Natal, has appointed Dr Tiawanna Taylor as the local coordinator on the project. Dr Taylor was previously a visitor at the University of KwaZulu-Natal and has significant knowledge and experience relevant to both the molecular forensic and wildlife aspects of the project.

Collaboration with similar projects in South Africa and other links

- Dr Taylor has made contact and links with a number of projects in the host country, including government authorities dealing in wildlife trade and permits, a TRAFFIC/DANIDA-funded project aimed at updating and training some organisations in biodiversity legislation and two other researchers who have undertaken some forensic work in respect of the illegal trade, plus other researchers in similar fields
- Internationally: contact has been made with organisations involved in tracking trade in wildlife and detecting illegal trade, e.g. CITES & TRAFFIC.
- Nationally: we are in contact with a number of government departments within the different provinces of South Africa, and NGOs including working groups for the two species that the project is targeting.

7. Impact and Sustainability

- Dr Taylor has been in contact with several endangered-species working groups, NGOs and government organisations to make them aware of the project. These organisations have expressed interest in the potential of DNA fingerprinting to address illegal trade issues.
- There is increasing interest in this work from within South Africa and Dr Taylor has been contacted by a number of bodies.
- Molecular Biology Unit: Further to the half-year report, it is still undetermined whether the University is to lease the MBU facility, in which this project is to be ultimately based, to the not-for-profit organisation that hopes to undertake research and development of projects aimed at building capacity in biotechnology-based services. The potential impact if this were to proceed is that most of the appropriate staff to be trained in forensic skills would work for the new organisation, rather than UKZN. Such an outcome is likely to be positive, as the not-for-profit company has expressed an interest in assisting the development and expansion of the forensic service to cover a wider range of biodiversity. This has the potential to enhance the longer term prospects for the project, providing a more substantial platform in which to situate the end-product of the Darwin Initiative Project.

- In case of a negative outcome at the MBU facility, we have examined and consulted informally other potentially suitable outlets in which to situate the final project, including a government body that is already using forensic genetics, to ensure that there will be a suitable platform from which the markers can be used, whatever the outcome, and that a satisfactory exit strategy will be available.

8. Post-Project Follow up Activities (max 300 words)

n/a – this is the first year of this project.

9. Outputs, Outcomes and Dissemination

Project Implementation Timetable & Project Outputs for May 2004 to April 2005

Original Planned Outputs	
MSc students selected	2 South African MSc students were, awarded bursaries, and have commenced their training and research
Legal requirements for forensic work within South Africa examined to determine where further information is required to draw up guidelines and techniques.	Contacts have been made with the appropriate authorities. This was delayed until the funding was transferred to enable travel for consulting with the appropriate people.
Students travel to UK to develop microsatellites for the Cape Parrot and Blue Crane in collaboration with University of Sheffield.	Students are currently in the UK developing the markers at TAB's laboratory at the University of Sheffield. This was later than originally planned due to delays in the agreements being drawn up with the University of KwaZulu-Natal, plus the fact that Jan-Dec is the South African academic year, when most students are available to begin MSc studies.
Consultation with UK experts on developing guidelines for forensic fingerprinting (FFS and wildlife bodies)	Dr Taylor is currently in the UK consulting with the appropriate authorities and researchers
Develop draft forensic guidelines to suit SA legislation, send to SA and UK collaborators for comments.	These have been delayed, however literature is being collected and will be reviewed. Contacts have been made with the appropriate government organisations and authorities, including the South African National Accreditation System (SANAS) responsible for the accreditation of forensic DNA facilities.
Students optimise microsatellites prior to analysis.	The start was delayed but is in progress and is unlikely to present a problem over the long term.
TAB in South Africa 1 week	Visit will take place in the latter period of the year after the students have returned to SA.
MSc and/or UK staff in SA will attend conferences to present findings (n=4+)	Not applicable until results have been obtained. Dr Taylor has attended a number of workshops.
Amount in value to be funded from other sources included in-	see Table 1 – in-kind salaries and office and laboratory space

kind which must be quantified > £135k	
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- o No public dissemination activities have been instigated as yet.

Table 1. Project Outputs (According to Standard Output Measures)

Code No.	Quantity	Description
14B	1	TT attended a Cape Parrot Working Group workshop
23	2	Time and salaries of staff TAB & MRP provided in-kind. Support staff at University of Sheffield provided in-kind.
23	1	Office space and use of facilities will be provided in-kind by UZKN

Table 2. Publications

Type *	Detail	Publishers	Available from	Cost £
(e.g. journals, manual, CDs)	(title, author, year)	(name, city)	(e.g. contact address, website)	

[No publications have been produced as yet.]

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10. 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 schedule)	Expenditure	Balance

10. Monitoring, Evaluation and Lessons

- At this stage of the project no major outputs or outcomes have occurred. The two South African students have begun their training and are beginning the development of the microsatellite genetic markers that will be used to detect illegal trade. This stage is being monitored through regular (at least monthly) meetings between TAB, the visiting students and the relevant host laboratory staff. There will be some time before this will be completed and subsequent outputs can be monitored.
- The main lesson learnt from this year's work is that setting up and managing a project of this kind, involving two universities and multiple collaborating bodies, requires a very significant investment of staff and PI time. Both TAB and Dr Taylor invested significantly in setting up and chasing people with regard to the required contracts and financial requirements needed to get the project running. This was delayed due to insufficient prior preparation due to the uncertainties of receiving the award. Additionally, the University of Natal merged with another University (Durban-Westville) to become the University of KwaZulu-Natal in January 2004. Following this, many staff and administration positions and responsibilities, particularly involving people required to make decisions on the project, were changed.

11. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum)

n/a

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2003/2004

Project summary	Measurable Indicators	Progress and Achievements April 2003-Mar 2004	Actions required/planned for next period
<p>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> • The conservation of biological diversity, • The sustainable use of its components, and <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>			
<p>Purpose</p> <p>Endangered Cape Parrot and Blue Crane protected through institutional capacity building at the University of Natal, with wildlife genetic forensic techniques developed to enable claims of captive breeding to be confirmed or refuted in order to detect illegally caught wild birds</p>	<p>Microsatellites developed</p> <p>MSc students trained</p> <p>Forensic methods developed</p> <p>Illegal trapping reduced</p> <p>Number of captive birds processed for database</p> <p>Successful prosecutions</p>	<p><i>(report impacts and achievements resulting from the project against purpose indicators – if any)</i></p> <p>Microsatellites are currently being developed</p> <p>MSc students are undergoing training</p>	<p><i>(report any lessons learned resulting from the project & highlight key actions planning for next period)</i></p> <p>Complete the development of microsatellite markers</p> <p>Collate forensic methods</p> <p>Increase awareness of project with authorities</p>
<p>Outputs</p>		<p><i>(report completed activities and outcomes that contribute toward outputs and indicators)</i></p>	<p><i>(report any lessons learned resulting from the project & highlight key actions planning for next period)</i></p>
<p>Microsatellite markers</p>	<p>Number and utility of microsatellites developed</p>	<p>MSc students started research</p> <p>Microsatellite currently being developed</p>	<p>Delays in start-up</p> <p>Students continue research and training</p>
<p>Protocols and Guidelines for forensic analysis</p>	<p>Manuals produced for laboratory and authorities</p>	<p>Contact with relevant parties made</p> <p>Literature and other information currently being collected</p> <p>Visits being made to UK relevant</p>	<p>Visit relevant SA authorities</p> <p>Being collating information into document form</p> <p>Visits being made to SA relevant</p>

		authorities and researchers	authorities and researchers
Wider awareness of methods to detect illegal trade (public/authorities)	Number of talks, publications posters and media presentations	Presentation made to Cape Parrot Working Group Contact made with relevant authorities Advising other groups on use of DNA in investigation	Further presentations Develop website and public awareness publications
Two MSc students trained in research and analysis	MSc theses and scientific papers produced	MSc students are undergoing training at Sheffield	MSc students to continue research
Dissemination of results	Interim reports, scientific and popular papers		

Note: Please do NOT expand rows to include activities since their completion and outcomes should be reported under the column on progress and achievements at output and purpose levels.