



Darwin Initiative for the Survival of Species

Annual Report 2006: Ref 13/014

***Capacity building in mammal
management for Western Cape
nature reserves***

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1. Darwin Project Information

Project Ref. Number	13/014
Project Title	Capacity building in mammal management for Western Cape nature reserves
Country(ies)	South Africa
UK Contractor	Durham University
Partner Organisation(s)	CapeNature, South Africa
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Project website	http://www.dur.ac.uk/r.a.hill/zebra_conservation.htm
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2. Project Background

Traditionally, the Western Cape, South Africa, has been a region where the majority of conservation efforts have been directed at preserving the unique local flora; the Cape Floral Region is home to a diverse and sensitive flora with large numbers of locally endemic and globally threatened plant species. Large mammals are relatively rare in Western Cape reserves and as a consequence large mammal censuses are not currently a feature of CapeNature policy. Nevertheless, the Western Cape is home to a number of rare mammal species, including Cape mountain zebra (CMZ), such that the capacity for long-term monitoring is essential in developing future management programs. Planned reintroductions of large native fauna (including flagship species such as black rhino) have highlighted the need to build local capacity and methodology for sustainable mammal censusing as part of a sound management strategy. This Darwin Initiative project is working towards implementing sustainable census methodology for CMZ at De Hoop Provincial Nature Reserve (DHPNR). De Hoop is itself a high biodiversity priority since its limestone fynbos is a hotspot of endemic richness. The De Hoop CMZ population is also extremely important as it is the only population to have originated from individuals translocated from two of the original relic populations; it is thus the most genetically diverse CMZ population. In the later stages of the project, however, we aim to expand the censusing to Kammanassie and Gamkaberg Nature Reserves, the two remaining natural populations managed by CapeNature.

The project is using computer software produced by CyberTracker Conservation in South Africa. This software is specifically designed to allow non-literate users to gather large quantities of geo-referenced data from field observations for projects that range from intensive monitoring of endangered species to large-scale regional programs and long-term monitoring of ecosystems. Through assessing the suitability of this software within the framework of monitoring the CMZ population at De Hoop, the study will develop the capacity for sustainable management of Western Cape large mammal populations.

3. Project Purpose and Outputs

The project has four primary objectives:

- i) Re-establish long-term monitoring of endangered Cape mountain zebra (IUCN Endangered, CITES Appendix I) at De Hoop Nature Reserve, and to establish monitoring at Kammanassie and Gamkaberg Nature Reserves in line with IUCN (2002) recommendations for successful management of small populations.
- ii) Develop a rigorous methodology for monitoring of flagship threatened mammal species using icon-driven handheld computer technology suitable for semi-literate to illiterate conservation field staff.
- iii) Develop clear large mammal census techniques for Western Cape nature reserves for new management policy of current reserves and to develop capacity for planned development of mega-reserves and reintroductions.
- iv) Integrate outputs of established monitoring into a comprehensive database to facilitate local and regional assessment of long-term trends and local stability of populations of target species.

4. Progress

Project history: This project is now in its second year, having started in October 2004. The Project Leader had previously worked at De Hoop Nature Reserve, and it was through contacting Peter Lloyd (Specialist Scientist - CMZ) at CapeNature with a view to initiating a project on the conservation genetics of CMZ at DHPNR that the need for the project was identified. Following a 2-week trip to South Africa in November 2004 to allow the Project Officer to meet our overseas partners and visit De Hoop Nature Reserve, the Project Leader and Project Officer travelled to South Africa in April 2005 to initiate the fieldwork phase. The Project Officer has remained in South Africa for the majority of the last year training local field rangers in using the CyberTracker system and updating the photographic records of the CMZ population.

Progress over last 12 months: Progress over the last year has been broadly in line with the baseline timetable. Although the Project Leader and Project Officer didn't travel to South Africa to initiate the fieldwork phase until April 2005, 2-3 months behind schedule, the initial training in CyberTracker and in-service training was completed on schedule. As a consequence, the 1-year pilot of CyberTracker was able to begin on schedule in October 2005. Over the same period the Project Officer was able to update the photographic records for the DHPNR CMZ populations and a paper on the current status of the De Hoop CMZ population is now in preparation. Other projected project outputs, such as posters and leaflets advertising the project have also been successfully completed.

Project achievements: The projects main achievement this year is in the training of the six field rangers and chief conservator at DHPNR. The Project Officer developed the CyberTracker routine for use of CMZ monitoring and worked closely with field staff in training them to use the system. A recent evaluation has shown this to be a great success (see Appendix 2). Over the same period we have updated and improved the photographic records and computer database for the CMZ population and these data are now ready for publication. Now that the 1-year pilot study of CyberTracker is in progress we have been able to focus on testing the various census methods, with

evaluations of the original driven route, distance methods, aerial surveys, capture-recapture and indirect dung counts all ongoing. The project is on target to achieve its original objectives.

Problems and difficulties: There have been no substantive difficulties over the course of the last year and the project has run relatively smoothly. Minor issues, such as restrictions on access to the Denel Corporation Overberg Test Range (DCOT) at certain times of year were always recognised as an operational constraint, and in general the relationship with this facility has worked well. We have also experienced a couple of minor software issues but again these have not been a major problem.

Changes to the design of project: There have been no major changes to the design of the project other than to increase the number of census methods tested in our research in response to our last annual report. In addition to including capture-recapture methods and dung counts in our assessment, we have also been able to conduct an aerial survey from helicopters and hope to repeat this again this year, possibly in conjunction with a microlight aerial survey. There are, however, a couple of potential changes that we might need to consider for next year. Foremost amongst these is the fact that the landscape at KPNR and GPNR is mountainous and quite different from that at DHPNR. As a consequence, aerial surveys are currently considered the only viable option for censusing these populations. While CyberTracker can be used in conjunction with these aerial surveys (see Appendix 3 for interim report) they may not offer substantial benefits to pen and paper. As a consequence, if our studies show aerial censuses to be the most accurate and cost-effective means of censusing CMZ and other large mammals in the Western Cape we may need to reconsider whether CyberTracker is a necessary component of this censusing effort. In turn this could have a knock-on effect for the way in which we approach the exit strategy.

Timetable for next year: The project has two main components for the coming year:

Apr – Sept 06: Completion of CyberTracker pilot study at DHPNR and assessment of techniques for censusing mammals in Western Cape nature reserves. Management plans produced and strategy for implementation of monitoring at KPNR and GPNR produced. Preparation of results for publication.

Oct 06 – Mar 07: Training seminar on use of CyberTracker to be held at DHPNR. Implementation of CMZ monitoring at KPNR and GPNR. Submission of general management plan for censusing large mammals at end of project.

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

The review of our last annual report had one primary recommendation that we expand our proposed assessment of census methodologies to include capture-recapture methods and indirect counts using dung sampling. We have taken these suggestions on board and attempted to integrate them into our work program. Although the review of census techniques is still ongoing, both methods have proved difficult to implement; capture-recapture due to the high frequency of sightings where identification is not possible while the animals are still in view and dung counts due to the apparent use of latrines by CMZ at DHPNR. These findings will be reported more fully in the review of methodologies.

The only other issue raised in the annual review was that the project web site contained only limited information and that some of the links were not operational. The web site

content has now been substantially updated and the links corrected to the new CapeNature web pages.

6. Partnerships

The collaboration with CapeNature continues to work well. Peter Chadwick has arrived as the new manager of DHPNR from KPNR where he had shown great interest in, and published articles on, Cape mountain zebra. As a consequence he has proved helpful in setting up the project on site and provided sufficient time with the field rangers during the training phase of the project. DHPNR now provides pairs of field rangers on 4 days per month to work directly on CMZ monitoring which is the level of work we requested. Mr Chadwick has also been instrumental in securing funds from CapeNature to conduct the helicopter aerial survey of DHPNR (see Appendix 3 for preliminary report). Aerial surveys are likely to be a key census methodology in the mountainous Kammanassie and Gamkaberg Nature Reserve's and this provision has been vital to the overall success of the project. As a consequence, we are more than happy at this stage with the relationship with our overseas partners.

Recently, we have been in communication with Dr Lawrence Watson of the Department of Nature Conservation at Port Elizabeth Technikon (South Africa) who has worked on the CMZ population in the Gamkaberg. There is the potential, in future, to integrate the output of our research. The Project Officer has again been invited to attend the Mountain Zebra Working Group meeting in June 2006 (at Mountain Zebra National Park) where she will present a talk on the project. This is an important forum for all of the major stakeholders working with mountain zebra and presenting at this meeting will further help to advance the objectives of this project. As a result of attending the International Mammalogy Conference in Sapporo, Japan, to present an invited talk in the equid symposium the Project Leader has been invited to join the IUCN SSC Equid Specialist Group. As a result, the project will be featured on the IUCN web site. Finally, we were approached this year by Khaki Fever Workwear with regard to sponsoring the project and CMZ conservation. The project will receive money from the sales of their Olive Epauletted Short Sleeve Shirt with the project and the Darwin Initiative advertised on the clothing tag (see Appendix 4). It is hoped that income from this advertising and donations to the project will provide additional money to support CapeNature in ensuring the long-term legacy of the project.

7. Impact and Sustainability

The Project Leader attended the International Mammalogy Congress in Sapporo, Japan, to present an invited talk on this project. As a result Dr Hill has been invited to join the IUCN SSC Equid Specialist Group and the project will be linked from the IUCN web site. Similarly, the Project Officer has been invited to present a talk on the project at the Mountain Zebra Working Group meeting in June 2006 at Mountain Zebra National Park. Within South Africa, promotional posters and leaflets (Appendices 5 & 6) have been produced for display at DHPNR and distribution at local guest houses and tourist venues. Promotion of the work by CapeNature has also resulted in contact from Khaki Fever Workwear who are now sponsoring the project and CMZ conservation through sales of their clothing. All of these elements have served to raise the profile of the project in South Africa.

Our exit strategy remains the same as that laid out in our original application. The field rangers and chief conservator will continue to work at De Hoop after the end of the

project, and are already operating independently of the Project Officer in collecting management data. As a consequence, successful long-term monitoring of CMZ at De Hoop is assured. In the final 6 months, the Project Officer will ensure that, following the training workshop, the methodology is successfully transferred to Kammanassie and Gamkaberg Nature reserves such that the monitoring program is functioning efficiently by the end of the project. This represents an extremely solid exit strategy for the continuation of this Darwin Initiative project, and will ensure large-scale monitoring of CMZ. The project will also leave a solid platform for CapeNature to develop the methodology to address their future requirements in managing large mammal populations. It is hoped that the sponsorship money from Khaki Fever Workwear will assist CapeNature in maintaining the CyberTracker units after the completion of the project.

8. Outputs, Outcomes and Dissemination

Outputs: All of the project outputs proposed for this year of the project have been achieved. Field rangers have received 4-weeks of initial training in CyberTracker followed by 5-months of in-service training (Output No. 6A/B). The Project Leader and Project Officer have spent 2 weeks and 38 weeks respectively in South Africa working on the project (Output No. 8). The DHPNR CMZ database has been updated to reflect the current population structure (Output No. 12B) and these results are now being prepared for publication. The Project Leader attended the International Mammalogy Congress in Sapporo, Japan, in August 2005 (Output No. 14B) in order to present an invited talk on the project and has subsequently been invited to join the IUCN SSC Equid Specialist Group. Finally, posters and leaflets describing the project (Appendices 5 & 6), the Darwin Initiative and CMZ conservation have been produced and placed on display in reception at DHPNR. Leaflets have also been distributed to local guest houses and tourist venues in order to further promote the project and CMZ conservation.

Dissemination activities in host country: Through the production of the posters and leaflets describing our Darwin Initiative project and the need for conservation efforts directed towards Cape mountain zebra we have been able to advertise our project widely within the Overberg region of the Western Cape. The posters have been particularly useful in informing visitors to DHPNR while the leaflets have allowed us to reach a broader audience through distributing them to local guest houses and tourist venues. Sponsorship from Khaki Fever Workwear has allowed us to advertise the project even more widely through information provided on the clothing tags. This sponsorship is anticipated to extend beyond the end of the project to provide funding for CapeNature to continue on the work.

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

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
6A/B	Training of 6 field rangers and chief conservator in South Africa	0	6 months			6 months
8	Project Leader in South Africa	4 weeks	2 weeks			6 weeks
8	Project Officer in South Africa	4 weeks	36 weeks			40 weeks
12B	Updated Cape mountain zebra database	0	1			1
14B	Project Leader and Project Officer attended Mountain Zebra working Group meeting	1	0			1
14B	Project Leader attended International Mammalogy Conference	0	1			1
19D	Project Leader on Teeside radio	1	0			1
	Project web site developed	1	0			1
	Display posters and leaflets created and distributed	0	1 poster 1000 leaflets			1 poster 1000 leaflets

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 schedule)	Expenditure	Balance
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The project continues to proceed on budget. There have been slight overspends on the travel and subsistence and equipment budgets but these have been offset by an under spend on the conference budget. The overspend on the travel budget has been caused by the advance booking of flights to South Africa whilst the equipment purchase relates to a digital camera that has become essential to the working of the project. These overspends will be balanced by under spends on the respective budgets next year. The under spend on the conference budget relates to the fact that the project leader was able to secure external funding to attend the International Mammalogy Congress in Sapporo Japan. This is extremely beneficial since as data are now emerging from the project that can be put towards further presentations, money remains available in the final year to attend conferences. The Project Officer is already scheduled to give a presentation at the Mountain Zebra Working Group meeting in June 2006.

10. Monitoring, Evaluation and Lessons

An important issue this year has been to identify methods through which we could assess the training progress of the field rangers involved in CMZ monitoring and their proficiency using the CyberTracker system. At the end of March we conducted an assessment of the ranger's ability to use CyberTracker using a written test where 'sightings' were created using a photograph book. Although the reserve had experienced computer problems in the run-up to the assessment, such that CyberTracker had been used only infrequently in the preceding two months, only one field ranger struggled with the task (see Appendix 2). Importantly, the other five field rangers made less than 1%

incorrect identifications confirming that the data generated by monitoring are likely to be accurate. Nevertheless, certain individuals performed better on identifying zebra and data entry than on data download, and vice versa. As a consequence it is recommended that in future field rangers work in pairs where their skills are matched. Overall, however, the assessment was positive.

The assessment of census techniques is still ongoing. A sample interim report on the helicopter aerial survey is attached (Appendix 3). Helicopter surveys are likely to be the preferred method for censusing large mammal populations, particularly in the mountainous KPNR and GPNR. Nevertheless, it is clear from this initial assessment that aerial surveys may not be as accurate as traditionally supposed. A further aerial survey and microlight survey are planned for the coming year to allow a detailed assessment of the value of these census methods. An important element, however, is that in the assessment of census techniques, censuses must not only be accurate but cost effective. At present, helicopter surveys may prove to be more cost effective than the current driven routes and this factor needs careful consideration when considering the long-term sustainability of any monitoring project.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2005/2006

Project summary	Measurable Indicators	Progress and Achievements April 2005-Mar 2006	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 • The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 			
Purpose			
To produce sustainable capacity for large mammal management in Western Cape nature reserves through development of icon driven computer software	i) Re-established monitoring of CMZ at DHPNR, new monitoring implemented at KPNR and GPNR, and a general increase in large mammal censusing ii) Operational icon-driven computer software for use by field rangers iii) Effective management plan for censusing of large mammal populations in Western Cape provincial nature reserves	(i) Monitoring of CMZ re-established at DHPNR. (ii) CyberTracker software developed for CMZ monitoring and in use at DHPNR (iii) Assessment of census techniques ongoing at DHPNR for monitoring large mammal populations in Western Cape nature reserves.	The coming year is the final year of the project and the key actions for this period are: (i) to complete the assessment of census techniques and prepare for publication and incorporation into management plan (ii) implement sustainable monitoring at KPNR and GPNR
Outputs			
Increased capacity for mammal surveying and management through staff training	8 field rangers trained in data collection at DHPNR; field rangers act as trainers for staff from other reserves	DHPNR field rangers trained in CyberTracker with progress examined through assessment (Appendix 2)	Field rangers work best in pairs. Training seminar for KPNR and GPNR planned for Oct 2006
Enhanced and updated CMZ monitoring and records	Complete population records for DHPNR and DCOTR conservancy	CMZ population records complete for DHPNR and DCOTR conservancy. Paper on current status of DHPNR CMZ population to be submitted for publication in May 2006.	Current DHPNR CMZ population has male-biased sex ratio; implications for CMZ conservation to be assessed.
Management plan for mammal surveys and conservation in Western Cape provincial nature reserves	Report on census techniques Recommendations to WCNCB management on future policy	Assessment of census techniques ongoing (sample interim report on aerial surveys enclosed)	Completion of assessment of census techniques and writing of management plan for CapeNature mammal surveys

APPENDIX 1: LOGICAL FRAMEWORK

<i>Project summary</i>	<i>Measurable indicators</i>	<i>Means of verification</i>	<i>Important assumptions</i>
<p><i>Goal:</i></p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve</p> <ul style="list-style-type: none"> • the conservation of biological diversity, • the sustainable use of its components, and • the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 			
<p><i>Purpose</i></p> <p>To produce sustainable capacity for large mammal management in Western Cape nature reserves through development of icon driven computer software</p>	<p>i) Re-established monitoring of CMZ at DHPNR, new monitoring implemented at KPNR and GPNR, and a general increase in large mammal censusing</p> <p>ii) Operational icon-driven computer software for use by field rangers</p> <p>iii) Effective management plan for censusing of large mammal populations in Western Cape provincial nature reserves</p>	<p>i) DHPNR management reports, CMZ database</p> <p>ii) Software adopted by WCNCB available from CyberTracker conservation</p> <p>iii) Peer reviewed publications (copies to Darwin initiative); management plan available from WCNCB</p>	<p>CyberTracker continue free software development</p> <p>Continued cooperation from DCOTR</p>
<p><i>Outputs</i></p> <p>Increased capacity for mammal surveying and management through staff training</p>	<p>8 field rangers trained in data collection at DHPNR; field rangers act as trainers for staff from other reserves</p>	<p>Field survey reports</p> <p>DHPNR management reports</p> <p>KPNR and GPNR management reports</p>	<p>Current field ranger levels maintained at DHPNR</p>
<p>Enhanced and updated CMZ monitoring and records</p>	<p>Complete population records for DHPNR and DCOTR conservancy</p>	<p>CMZ database available in enhanced electronic format</p> <p>Peer reviewed publications (copies to Darwin initiative)</p>	<p>Continued cooperation from DCOTR</p>
<p>Management plan for mammal surveys and conservation in Western Cape provincial nature reserves</p>	<p>Report on census techniques</p> <p>Recommendations to WCNCB management on future policy</p>	<p>Peer-reviewed publications (copies to Darwin initiative)</p> <p>Management plan available from WCNCB</p>	
<p><i>Activities</i></p> <p>Training programs</p>	<p>Activity Milestones (Summary of Project Implementation Timetable)</p> <p>Yr 1: Initial game ranger training (Apr 05) followed by in-service training with field ranger feedback at DHPNR (May 05 – Oct 05); Yr 3 field ranger led training seminar at Potberg for rangers from KPNR and GPNR (Oct 06)</p>		
<p>Software development</p>	<p>CyberTracker software developed for CMZ monitoring at DHPNR by Sep 04; field tests and development to produce final version by Oct 05</p>		
<p>Field research</p>	<p>Yr 1: Monitoring re-established for CMZ at DHPNR with long-term records updated in enhanced digital format by Oct 05; Assessment of CyberTracker software and census techniques completed by Oct 05; Yr 2: Pilot study of CyberTracker software on DHPNR CMZ completed by Oct 06; Yr 3: Introduction and assessment of CMZ monitoring and management plan at KPNR and GPNR from Nov 06</p>		