



South Africa's Scavenger Species

2011 FIELD REPORT

Background Information

Lead PI: Dr Dawn Scott

Report completed by: Dr Dawn Scott

Period Covered by this report: April to December 2011



Dear Earthwatch volunteers,

Wow what a year!!! Seven teams, 47 volunteers from all over the world. It has been a pleasure getting to know you during your time with us. Thank you to all the volunteers that spent endless hours looking for scat, spotlighting until late at night, and pulling smelly guts to camera traps, your efforts greatly appreciated by all the scientists involved and especially the scavengers that are often forgotten. Without your support and interest none of this would be possible.

We have had so many highlights this year, where to start? There has been warthog hugging, fire fighting, python rescuing, and some amazing wildlife sightings including the back-footed cat which is of conservation concern and has not been recorded in the region for a while. We have had lots of fun as well meeting all our research targets in data collection. This year we have covered over 800km of spotlighting, completed 50 camera trap locations, and cover 265km of latrine surveys, recording 570 hyena and 330 jackal latrines. The dung beetle team recorded 45 different species and collected over 1015 individuals! Louis' analysis of the radio-tracking data from the vultures has been showing just how far these birds go, with records from South Africa to Namibia and very little use of protected areas, so that is providing essential data on the ecology and conservation of these species.

So an amazing amount of work covered which all feeds into our data bases for analysis.

Other highlights for us and the volunteers have been the school education days, where we had approximately 250 children visit us this year. Volunteers, staff, and students get a lot out of their visits and we hope to continue this community involvement. Personally we have been touched by Lucy's passion to stop the rhino poaching. She helped Lynne set up a blog and has put up anti rhino poaching signs in the Natural History Museum in London. This shows that when you are passionate enough about something you can make a difference.

We wish all the teens that are embarking on their university careers all the very best, you are all incredible people and just the fact that you chose to spend your summer holiday helping a conservation project tells us that you will be successful in whatever you do. Unfortunately we will be losing Louis and Louisa from our research team in 2012. Louisa is due to complete her PhD this year and is busy analysing her data and writing up and Louis has returned to the UK after successfully completing his MSc. We will miss them both and wish them the very best in the future, but I am sure we will be hearing from them again and be keen to see the results of their analysis.

Thanks again, we hope you enjoyed it as much as we did and keep an eye out for the outputs and impacts of your involvement with our project!

A handwritten signature in black ink, appearing to read 'Lynne', with a stylized, cursive script.

Lynne, Dawn, Richard, Anja and Louis

SECTION ONE: Scientific research achievements

Top highlight from the past season

Our latest publication accepted by Biological Conservation gives some indication of the number of carnivores killed each year in the area. Overall, sixty-seven per cent of farmers use lethal control of carnivores. From 99 farmers' records of control we estimated the number of carnivores killed in the province are around 18,476 jackals, 699 caracals, 275 leopards, 137 cheetahs, and 55 brown hyenas. These figures represent six per cent of estimated leopard numbers in South Africa's 10 main sub-populations, thirty-four per cent of estimated free-ranging cheetah numbers outside of protected areas, and three per cent of estimated total population size for brown hyenas in South Africa. The effect that reported destruction rates have on the conservation status and sustainability of the many species is difficult to infer because of a lack of reliable, contemporary population estimates and local demographic data. However, the brown hyenas occur within a restricted distribution range in the South West Arid Zone of Southern Africa and the estimated global population comprises <10,000 mature individuals. A ten per cent population decline over three generations would cause brown hyenas to be re-classified as "vulnerable". Therefore, an annual provincial destruction rate of three per cent of the national population could constitute a serious threat to the species.

Reporting against research objectives

1. To determine the distribution and abundance of scavengers across the North West province and determine what factors are affecting distribution patterns using GIS analysis.

Publication of updated distribution maps and associated population estimates for carnivores in: Thorn, M. Green, M. Keith, M., Marnewick, K., Bateman, P.W., Cameron, E. Z. and Scott D.M. (2011). Distribution patterns and implications for the status of carnivore populations in northern South Africa. *Oryx*, Issue 45, Vol 4: pp 579-586.

An additional paper is being compiled on landscape effects determining presence using GIS by Michelle Thorn and a multi-species biomass and sympatric species analysis lead by Richard and Emma.

Carnivore abundance estimates are currently being analyzed by Louisa during her PhD write up and she is aiming to convert some of these analyses into publications and reports. Robert is conducting abundance and population studies on jackals, analysis will be undertaken in 2012/13.

Vulture spatial analysis has been completed by Louis for his MSC and is being converted to a publication by his co-researchers due for submission in 2012.

2. Assess and compare scavenger presence, abundance, density, diet, breeding and habitat use within different levels of protection and land use.

Louisa is undertaking analysis of comparisons of species composition, ecology, and abundance between protected and unprotected sights. Robert is undertaking wider surveys outside Earthwatch areas to gain further data on the impacts of persecution levels on jackal ecology and demography.

Dietary studies on hyenas and jackals are continuing at Nottingham Trent University under supervision of Richard.

3. Assess the frequency and availability of carrion and other potential food items inside and outside protected areas and to evaluate the levels and types of management deployed with respect to scavengers.

Carrion availability has been recorded by Louis and is continuing to be monitored across several sites. Food availability from spotlighting by-catch is also being analyzed by Louisa and Richard as part the analysis of the determinants of abundance by Louisa.

Levels of regional carnivore control have been analyzed and will be published in: Thorn, M. Green, M. Dalerum, F., Bateman, P.W. and Scott D.M. Dimensions and determinants of human-carnivore conflict in the North West Province of South Africa (Accepted Biological Conservation, 2011, due out 2012). This will be supplemented by Louisa's national questionnaire analysis which is due to be completed end of 2012.

4. To investigate the effect of mammalian community composition on dung beetle diversity.

The pilot stage has been completed and the first analysis was submitted as: James R & Rott, AS (2011) Scarabaeidae communities – patterns in dung preference and precipitation influence. Submitted to Journal of African Ecology. Grazers and browsers have been so far targeted and have shown significant differences in abundance and communities of beetles they support. 2012 will develop this to also look at carnivore faeces.

5. Promote human-wildlife coexistence through training, educational support, publicity, and promotion via a range of media.

See outputs below regarding community engagement, student support and involvement and project outputs.

Changes to research plan or objectives

With the departure of researcher Louis Phipps we have had to slightly change the vulture research on the project. The new methods have been detailed in the updated volunteer handbook for 2012. The overall project objectives have not changed but the vulture activities have had to be reduced slightly. Vulture methods are now as follows: volunteers will be trained how to carry out vulture roost counts, surveys for evidence of fatal bird-power line interactions, recording of antelope mortalities, and the use of camera traps to monitor the utilization of ungulate carcasses by scavengers. The numbers of vultures perching on electricity pylons will be counted using telescopes in the evening, and the volunteers will also search for any vultures fitted with coded wing-tags. Volunteers will also carry out walked surveys beneath power lines to record evidence of fatal collisions by vultures and other large birds. The volunteers may also search for and record details about antelope deaths to provide information about seasonal ungulate mortality and therefore the availability of food for the scavenging community. Camera traps will sometimes be placed at a carcass to monitor the diversity and abundance of different species utilizing carrion on the reserve. All of these activities will be carried out regularly throughout the year depending on time availability and the presence of carcasses during the expedition.

SECTION TWO: Impacts

Partnerships

Mankwe Wildlife Reserve - our field base and support staff. Lynne MacTavish is also in-country lead scientist for the project.

North-West Parks and Tourism Board (NWPTB) is a government agency that administers 14 protected areas, we work within several of these protected areas and are supported by their staff. Stephen Dell is part of our field team.

University of Pretoria (UOP) academic staff involved includes Philip Bateman and Frederick Dalerum, as scientific collaborators on the project. UOP also currently hosts the GIS database site for terrestrial mammals into which our data is input, run by Tim Snow.

Endangered Wildlife Trust (EWT) is an NGO with working groups in carnivore conservation, wildlife conflict, and biodiversity stewardship. We are in collaboration with them to utilise the data and extend the project to address further conflict issues. This includes vulture and carnivore work and we have been working closely with Kelly Marnewick.

Nature Conservation (NC) is a government agency that assists farmers with human-wildlife conflict. We have been working with NC to identify conflict issues and build up regional maps of species distributions in the area.

Contributions to conventions, agendas, policies, management plans

International

Papers and information are submitted to IUCN hyena specialist groups for species assessment. Information on vultures is passed on to VulPro and international databases for these species.

National or regional

Data incorporated into National Mammal GIS database for wider range management and landscape planning and the National Vulture monitoring data base.

Local

Data is submitted to North West parks board and Mankwe Wildlife Reserve to incorporate into their management plans.

Developing Environmental Leaders

Lauren Jones (Zoology BSc student, University of South Africa). Received an African Fellowship/Earthwatch Training Grant in 2010. Currently studying for a BSc in Environmental Management - Zoology (2nd year) - completed access module in 2010 with distinction in Geography.

Wikkus and Jason have been placement students at Mankwe this year from Technicon University in Pretoria and have been field team leaders for the project.

Louisa Richmond-Coggan (PhD student, Nottingham Trent University UK) - field team leader of several teams, supported with equipment and covers a wider range of sites for the project than those that can be covered with volunteers. He's leading collaring and intensive camera trapping studies.

Robert James (PhD student, Brighton University, UK) - field team leader for 2011 - has developed PhD thesis of expansion on conflict ideas and is leading on jackal side of project in 2011.

Actions or activities that enhance natural and/or social capital

Links with local schools have increased and we have up to 500 local school children visit the project every year. This year we have developed a relationship with The Holy Family School in Mogwase and we plan to invite four teams a year to Mankwe for a conservation day and to help the school set up a wildlife and environmental programme. The project helps to financially support the continued running of Mankwe wildlife reserve and all their

associated staff to support it as an educational base. The project also helps to raise North West Parks profile to attract tourists and hopefully revenue.

Conservation of Taxa

Brown hyena (*Parahyaena brunnae*), IUCN “Near Threatened” status – populations maintained and hopefully enhanced. IUCN 2008 conservation assessment status input, plus recent submission of new distribution maps and population assessment estimates for the region to be published in 2010/early 2011. Information on genetics will help to enhance genetic diversity. Importance and size of population at PNP assessed to ensure incorporation into future management plans to maintain this population.

Conservation of Habitats

Our monitoring work helps to provide essential data for continued protection and management of the national parks and wildlife reserve in which we survey and provide data.

Ecosystem Services

It is important that the landscape of South Africa maintains both its cultural integrity and its biodiversity. Ecotourism is a very important source of revenue in South Africa, so it is important that biodiversity is maintained. This work is helping to identify best practices in farming to ensure both the continuation of sustainable grazing cultures and biodiversity. Enhanced tolerance of scavengers within farmlands by highlighting their importance in ecosystem functioning and enhancing biodiversity will help restore and maintain ecosystem function.

Impacting Local Livelihoods

The project helps to financially support the continued operation of Mankwe Wildlife Reserve and all their associated staff, to support it as an educational base, and provide revenue for the numbers of visitors to the area. The project also helps to raise North West Parks research profile to attract tourists and hopefully revenue for the park.

Local community activities

Links with local schools have increased and we have up to 500 local school children visit the project every year. We work with at least 10 different landowners regularly for monitoring and have had connections in terms of questionnaires and surveys with over 200 now nationally and locally. We provide research talks to North West parks so that we can

feedback the results on the project and attend national discussion conference forums on wildlife management where possible.

Dissemination of research results

Scientific peer-reviewed publications

Earthwatch Acknowledged on all the following papers:

Thorn, M. Green, M. Dalerum, F., Bateman, P.W. and Scott D.M. Dimensions and determinants of human-carnivore conflict in the North West Province of South Africa. (accepted *Biological Conservation*, 2011, due out 2012).

Thorn, M. Green, M. Keith, M., Marnewick, K., Bateman, P.W., Cameron, E. Z. and Scott D.M. (2011). Distribution patterns and implications for the status of carnivore populations in northern South Africa. *Oryx*, Issue 45, Vol 4.: pp 579-586.

Thorn, M., Green, M. Bateman, P.W., Waite, S. and Scott, D.M. (2011) Brown hyenas on roads: Estimating carnivore occupancy and population size using spatially auto-correlated sign survey replicates. *Biological Conservation*, Vol 144 (6): 1799-1807.

Pilot data from preliminary studies submitted to: James R & Rott, AS (2011) Scarabaeidae communities – patterns in dung preference and precipitation influence. Submitted to *Journal of African Ecology*.

Grey literature and other dissemination

Scott, D.M., Yarnell, R. McTavish, L. , Phipps, L. , James, R. & Rott, A. *Recycling services provided by South Africa's scavengers*. Oral presentation. International Association of Landscape Ecology UK Conference, September, 2011.

Scott, D.M., Yarnell, R. McTavish, L. , Phipps, L. , James, R. & Rott, A (2011). *Recycling services provided by South Africa's scavengers*. In Proceedings of the 18th Annual meeting of the International Association of Landscape Ecology UK Chapter

Richmond-Coggan, L. *Brown hyaena home ranges based on GPS telemetry data*. Spatial Ecology and Conservation Conference University of Birmingham, September 2011.

SECTION THREE: Anything else

Project funding

Additional funding is received from the University of Brighton and the University of Nottingham in terms of associated PhD student funding for Louisa Richmond-Coggan and Robert James. It is approximately \$45,000 to support a PhD student over three years, hence an additional \$90,000 worth of funding. We have applied for the Neville Shulman Award (unsuccessful) and are planning to submit a Whitley award next year to support the educational element of the project.

Acknowledgements

Carnivores: Thanks to Mankwe Wildlife Reserve and Northwest Parks Board and all their staff for all their support in maintaining the project. Thanks to Louisa, Rob, Pennt, Lauren, and the entire field staff at Mankwe for their input into the project. Thanks to Louis for data base maintenance and Michelle for data analysis into publications and linkages with EWT and UOP in terms of cross data collation. Thanks to all the school teachers who help arrange the school trips and the children who come and engage with the project. Thanks to all the landowners for access to their land for jackal and hyaena surveys and their input and support. Finally thanks to Lynne without whom the project would not exist and not continue to be successful she really is the foundation of the whole project.

Vulture project: Thanks to Dougal, Gill, Lynne MacTavish, and all of the field staff at Mankwe Wildlife Reserve for their hard work in maintaining the magical wildlife reserve and in running the project. Without their passion for conservation, this project would not be possible. Thanks to Kerri Wolter, who is a co-researcher and co-author for the vulture tracking research, and to her organisation VulPro, for providing training and financial assistance. Thanks to The Leverhulme Trust for sponsoring Louis Phipps, and Eskom for providing funding for GPS tracking devices. Thanks to everybody else for their support.