



Dear Volunteer,

South Africa's Brown Hyaena Project annual letter

2008 was another great year for all those concerned with project Phiri. First and foremost, we had four amazing Earthwatch groups work with us collecting valuable data on the hyaena populations in Northwest Province, whilst at the same time life changing experiences were had, new friendships made and some amazing experiences were gained. The hospitality of Mankwe Wildlife Reserve was as incredible as ever, with Mkozi's (the cook's) 'sisters' certainly one of the most fondly devoured of the deserts. Mankwe is the hub of the project and it is one of the reasons why the brown hyaena Earthwatch project has been such a success over the years. This is largely due to the hard work of Lynne and Dougal and their staff such as Louis. Unfortunately, none of the 2008 volunteers had the good fortune to meet the driving force behind the project, Dr Dawn Scott, due to her giving birth to her second son Drew. Although Dawn was not there in person, she was certainly there in spirit behind everything that went on. Dawn has since been back out to Mankwe for the first Earthwatch team of 2009 and will be directing operations in the field on a much more regular basis from now on. In August, I had a great time with the volunteers and was grateful to the help provided by an ex-volunteer of the project Yoka who acted as our teen team facilitator. In November, we were once again joined by Dr Bryony Tolhurst from the University of Brighton. I'm sure I speak on behalf of all the project staff that all the volunteers have once again been an immense help to us and it has been an absolute pleasure to work with you all during the last year.

In terms of data and the increasing knowledge we are gaining about the brown hyaena, the project has taken another step forward. We managed to collar another individual in Pilanesberg, which takes our total now to three, and successfully continued to monitor the populations which are now beginning to yield information in annual changes in the populations which is very important for the conservation of this species. We have also started collecting DNA from the hyaena pastes with which Dr Andy Overall at the University of Brighton hopes to reveal much about the genetic variability of the animals inside and outside protected areas.

Overall our 2008 volunteers helped us to undertake the following:

- 500 km of latrine surveys recording 615 hyaena latrines!
- 46 call-ins resulting in sightings of 9 browns, 22 lions, 30 jackals and 1 caracal.
- 270km of night spotlighting encountering 3 hyaenas at Pilanesberg and 1 at Mankwe (as well as many other nocturnal species).
- 45 camera trap nights at Mankwe resulting in no photos of brown hyaenas but we will keep trying!
- Collection of at least 90 anal pastes for DNA sampling.

Earthwatch volunteers were rewarded with amazing sightings in 2008. It started with the discovery of an active Hyaena den in the Pilanesberg National Park by the January team. Volunteers were able to spend a few hours every evening watching a mother and 2 cubs interacting. It was a very special experience to watch the female grooming and suckling her young before she set off for her night of foraging. They were also treated to good lion and elephant sightings, as well as a beautiful herd of sable antelope in Kgaswane Mountain Reserve. The volunteers were also privileged to be able to feed a pack of wild dogs. The team also became professionals at pushing vehicles out of the very muddy roads as their arrival broke the drought with down pours of rain, which resulted in swollen rivers and impassable roads for the first few days.

We especially enjoyed the teen team because of their enthusiasm and never ending energy. They were by far the best team at "poo spotting" and their technical "know how" greatly benefited the project. They worked very well as a team; the perfect example of this was the effort they put in during a fire management exercise. Their rapping skills around the campfire at night were exceptional as was their ability to play the djembi drums. All of this enthusiasm was rewarded with amazing lion sightings and eventually we managed to call a brown hyaena to a few meters from the car. We also managed to re-capture Tina and remove her collar as the battery was running out. On her release, we provided her with several pieces of meat which she took one by one to the safety of a thicket which gave us some beautiful observations. We also managed to capture hyaena number 3 at Pilanesberg, a female we called Bonnie. We tracked her for four months before we removed her collar. The November team helped with the re-capture by cleaning her up. It was then a labour intensive job to build her a den out of branches and grass, where she would be able to hide in safety until she was strong enough to be released. She was released successfully back into the reserve one week later.

The second August expedition had a very difficult task of finding all the "poo " spotted by the teens. They embraced this challenge and succeeded in finding all of the latrines. Their hard work was also rewarded with some of the best sightings we have ever had. This team was left speechless when a pride of 16 lions came running in to a "call in" and lay around the research vehicle. They were also fortunate enough to see the very rarely seen black rhino and aardvark.

The November expedition was able to get involved in a brown hyaena darting and the removal of Bonnie's collar. This hard working team also assisted the management of Mankwe to remove snares set by poachers. This team experienced one of the most breathtaking moments I have ever had at night. We found ourselves surrounded by the breeding herd of elephants. They were so close we could hear their breathing and rumbling stomachs; there was a sharp intake of breath as one of the matriarchs pressed her head against the windscreen and the rubbed herself against the side of the vehicle. Eventually the herd moved off and we were just starting to recover when we came across 2 huge male lions running down the road towards us. They too ran so close that we could hear their heavy breathing as they ran past.

In 2009, we will be running 5 teams and continuing our monitoring as well as methodological comparisons. This year we have a new PhD student, Louisa Richmond-Coggan from Nottingham Trent University, joining the project and she will be continuing to collar and monitor hyaena in the region to compare their behaviour and habits inside and outside Pilanesberg. We also hope to collect more DNA samples so that we can look at the genetic structures of the two populations.

From Dawn, Lynne and myself, I'd like to thank all of you for your amazing contribution to our project. Without you, none of this important work would be happening. We hope to have our first publication ready for submission in early 2009 so you can see that all your hard work

has helped us to understand about the ecology and surveying of this species. The insights that we gain will have lasting impacts on the future survival of brown hyaena in the area.

Best wishes and stay in touch!

A handwritten signature in black ink, appearing to read 'R. Yarnell', written in a cursive style.

Dr. Richard Yarnell

EARTHWATCH INSTITUTE ANNUAL FIELD REPORT

Project title: South Africa's Brown Hyenas

Date completed: 26th February 2009

Completed by: Dr. Dawn Scott

Period covered by this report: Jan 08 to Nov 08

Reporting on research objectives

1. Provide a summary of progress this year towards each of the objectives stated in your most recent research proposal. If work has not yet started on some of these objectives, state when you will start to work on them.

Please note these are our overall project objectives and Earthwatch volunteers don't collect data on all of them directly, but the work Earthwatch volunteers do are incorporated into several aspects of the project.

Objective 1: Design a rapid assessment method for surveying brown hyenas by comparing and validating a range of different field survey methods used to determine presence (detection), abundance, and monitor population trends.

This objective is near completion. Recently we have submitted three scientific papers regarding aspect of this objective: one on comparing methods in high and low density areas; one on camera trapping methodology for detection; and another on trialing application of methods to develop occupancy models for the region.

R.W.Yarnell, M. Thorn, E. Stone, and D.M. Scott: Evaluation of survey techniques for brown hyaenas (*Hyaena brunnea*) in South Africa. Submitted to Wildlife Research.

Thorn, M., Scott, D., Green, M., Bateman, P., Cameron, E. & Yarnell, R. Comparative performance of sign surveys, spotlighting, camera trapping and audio playbacks in a landscape-scale carnivore survey. Submitted to Journal of Wildlife Management.

Thorn M., Scott, D.M., Green M., Bateman P., Cameron E. (2009) Camera Trapping as a Means of Estimating Brown Hyaena Occupancy. South African Journal of Wildlife Management. Accepted.

There are still potential developments within this objective. One of the issues raised is accuracy of methods rather than precision. Hence we are hoping to tie in more accurate estimates of densities with methods to compare accuracy. In light of our findings we are developing and trialing other survey methods such as intensive camera trapping for mark recapture analysis to obtain population estimates and drag baiting methods. Work on refining methods to improve accuracy is continuing with Earthwatch teams. Methods are also being employed to determine effectiveness of population trend monitoring.

Objective 2: Assess and compare brown hyena presence, abundance, density, diet and habitat use within areas of different levels of protection and land use.

To investigate habitat use and ranging behaviour, we are using radio-collars and also assessing diet in different areas. We have had three collars on animals at Pilanesberg and collars on animals at Madikwe GR and other game reserves, and the data collection is ongoing. We have been applying for grants to obtain more collars and have been successful at securing funding for six more collars. In 2009, it is hoped 4-6 more collars will be fitted and

further data on habitat use, ranges and ecology will be collected. We are hoping our Earthwatch volunteers will assist us in collecting these data. The dietary analysis has been undertaken by a student at the University of Pretoria and we are waiting to see the report.

Objective 3: Determine brown hyena threats to livestock, both actual and those perceived by landowners, and assess the extent of hyena 'control' through socio-economic based questionnaires.

In 2008, 99 landowners' questionnaires were completed in the northwest province by our PhD student. The data are currently under analysis and will be available for interpretation May 2009. We are hoping these data will identify issues that will enable us to develop and modify this project aim to assess other issues regarding brown hyaena ecology and conservation, and to integrate some of these issues into methods that Earthwatch volunteers can engage with collecting data on.

Objective 4: Attempt to determine brown hyena density in the northwest province by occupancy analysis and undertake GIS analysis to look at spatial patterns in an attempt to determine source and sink areas.

Using data from a range of sources so far we have presence/absence data from approximately 150 sites across the North West Province. This is comprised of data from surveys, regional surveys, occasional reports, questionnaire data and data from our collaborators. 99 sites have been surveyed by questionnaires and field surveys undertaken in 50 sites across the region. These data have allowed us to calculate a density estimate for the northwest province. This information should be available in the next few months. In 2009, we are hoping to start to use these data sources to develop a more detailed map of distribution in the North West province and, from this, start to investigate spatial patterns in occupancy and abundance. We are hoping this will be ongoing but in some format for dissemination in 2010. We are also looking at modifying the questionnaires for Earthwatch volunteers to undertake at cattle and game auctions and markets to get more data on distribution and threats.

Objective 5: Through genetic analysis investigate the possible consequences of isolation between populations inside and outside protected areas, to determine their viability.

In 2008, we secured a Peoples Trust for Endangered Species grant to collect DNA samples for genetic studies and funds for lab analysis. DNA analysis can help us understand the relatedness of animals from different populations, determine if certain protected areas have isolated populations, and the possible impacts of isolation on population viability. The aim of the DNA analysis is to firstly refine the technique to work on brown hyenas. To date, there are no specific markers for brown hyenas so we have been utilizing spotted hyaena markers to try to get them to work. So far, Dr Andy Overall (our collaborating geneticist) has managed to get eight markers working. The second aim of the DNA analysis is to see if we can get DNA from other samples other than blood and tissue, i.e. pastes, hair or faeces. We have eight tissue or blood samples from five sites in the region. Approximately 90 pastes from animals at PNP and faecal samples from three sites. We have also been trying to obtain further DNA from biopsy darting although this is proving difficult. Progress is slow but it is looking promising and we hope to get results by the end of 2009. We will continue to collect samples for DNA analysis.

Objective 6: Promote human-wildlife coexistence through training, educational support, publicity and promotion via a range of media

The project has engaged in a wide range of publicity through a range of media. We have had several film makers, photographers and journalists on site with us during expeditions.

'Walking with Purpose' By Huw Williams in Travel Africa Summer 2008

Oral presentation at the Mammal Society Conference in Easter 2008, audience approx 250

Royal Geographical Society Talk, London Oct 2008, audience approx 200

This year has also seen us busy with analysis and writing and so far the group has submitted three papers for scientific review (see above).

In January 2009, we have planned a talk for the regional Northwest parks board and project collaborators to give an update on the project.

We have also submitted two articles for Pilanesberg News – awaiting publication.

Project development

1. If you have removed or modified your original objectives please explain why below. See the objective report above.

Objectives were modified last year. This year we have not modified the objectives but we will be changing the objectives in 2009/2010 in light of new findings in the data analysis and as our objectives are met.

2. What logistical or scientific challenges have you encountered in the past season and how will you address these during the next field season?

As we are attempting to answer questions, we are finding new ones and ideas for development and expansion, as with any good scientific investigation! As all three PI's are in different locations we are having to develop a communication strategy and arrange annual or biannual meetings for us all to catch up. In January 2009, we arranged a project meeting to update and review the project as well as using this opportunity as a meeting with our main collaborators and disseminate our first three years' findings. This was essential for the projects productivity and development. As the Earthwatch activities fit into wider project objectives we are using postgraduate students to fulfill other project aims that can't be met by volunteers due to logistical and health and safety constraints. However, we are developing ideas to enable full engagement and utilization of volunteers to maximize data collection and not compromise their experience. They are essential for the overall success of the project so we need to ensure their support where possible. Data on the ecology and movements of species and also the genetic analysis requires further funding as field work costs that are covered by Earthwatch are just one aspect and the field work would be less useful without the extensive amount of work that goes on outside of expedition time.

Non-technical summary of results

1. Give an account of the data collected and results (inputs and data) for the period covered by this report, mentioning any emerging trends.

Our 2008 volunteers helped us to undertake the following:

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- 46 call-ins resulting in sightings of 9 browns, 22 lions, 30 jackals and 1 caracal.
- 270km of night spotlighting encountering 3 hyaenas at Pilanesberg and 1 at Mankwe

(as well as many other nocturnal species).

- 45 camera trap nights at Mankwe resulting in no photos of brown hyaenas but we will keep trying!

In addition we have at least 90 anal pastes for DNA sampling. This is being worked on in the lab and we are making good progress toward establishing genetic markers for brown hyaenas for future analysis of further samples we collect. Volunteers also helped us to recover and care for one of our previously collared animals that had been injured in an encounter with another animal and were also involved in poo analysis! Outside of data collection, they helped with anti-poaching patrols looking for snares and assisted with fire and game management. We have data now from three collared animals in PNP with preliminary ranges from 150 to 450km², giving us more insight into their activity and movements.

Data Summary 2008

Latrine Data

Site & Team	KM driven	No. of BH latrines	Frequency of latrines
PNP			
January	77.5	18	0.23
August 1	68	269	3.9
August 2	68	(+151 scats & 21 lats)	
November	92	149	1.62
Mankwe			
January	14	0	0
August 1	65	9	0.14
August 2	20	1	0.05
November	65.7	6	0.09
Kgaswane			
January	11.5	2	0.17
November	18.4	10	0.54
Totals	500	615	

Spotlighting Data

Site & Team	KM driven	BH	J	Li	G	ST	SH	C	P	D	SpH	WH
PNP												
November	90.6	3	6	2	5	16	11	1				
Mankwe												
January	27.7		1		2		2					
August 1 & 2	122	1	5		1	23	39			2	1	1
November	30		6		1	2	3	1	1			
Totals	270.3	4	18	2	9	41	55	2	1	2	1	1

Where: BH = Brown Hyena, J = Jackal, Li = Lion, G = Genet, ST = Steenbok, SH = Scrub hare, C = Caracal, P = Striped polecat, D = Duiker, SpH = Spring hare & WH = Warthog.

Call-in Data

Site & Team	No.	BH	J	Li	C
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PNP					
January	15	5	4	1	1
August 1	12	4	8		
August 2	9		10	21	
November	-				
Mankwe					
January	4		1		
August 1	2		2		
August 2	2		4		
November	2		1		
Totals	46	9	30	22	1

Camera trapping November 2008:

Mankwe: 45 nights = 0 hyenas!!!

2. How do these data contribute to achieving **conservation impacts?** (e.g. actions based on results, management plans, site protection)

All data and publications will be passed on to the IUCN and Northwest Parks and Tourism Board.

The questionnaire data will help us to identify and quantify the levels of persecution of brown hyenas in an unprotected area and identify the current threats in the region.

All data from across the region will allow us to develop higher resolution distribution maps for the species.

Population estimates for the region should allow us to refine geographic population estimates and determine if the current conservation status is correct.

Some of the data from the project have already been included in the recent update of the IUCN status of brown hyenas:

Wiesel, I., Maude, G., Scott, D. & Mills, G. 2008. *Hyaena brunnea*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. <www.iucnredlist.org>.

The Northwest Parks and Tourism Board is continuing to support the work of the project and several parks have approached us to expand our surveys to provide more information on this species for conservation action.

The genetics will hopefully inform us of the viability of populations inside protected areas and if any action on maintaining this viability is necessary to ensure their long term survival.

3. What is/ are the **significance/ benefits** of your research at the following levels?

- Local (to the area of the research site)

Locally, the project is helping to inform landowners of carnivore conservation issues and highlighting the limited economic impact that brown hyena have on livestock in the region. We are also helping the Northwest Parks and Tourism Board to gain an idea of how many brown hyena and other carnivores exist within their parks in the region and how important their populations are to the overall conservation of the species.

- National / Regional

The data will be used by the IUCN Hyena Specialist Group to enhance their population estimates for the region and help them more accurately gauge the threat to this species throughout its range.

- International

The project is hoping to review the status of brown hyenas in South Africa and their current threats which will be able to be compared with other areas of its range to draw some wider conclusions for the species. Many of the issues are applicable to other carnivore species across wider ranges and therefore can have international applications.

Communication of results

Please list all dissemination outputs for the period covered by this report, or outputs soon to be released, for the categories below.

Printed:

Scientific Papers submitted:

R.W. Yarnell, M. Thorn, E. Stone, and **D.M. Scott**: Evaluation of survey techniques for brown hyenas (*Hyaena brunnea*) in South Africa. Submitted to Wildlife Research.

Thorn, M., **Scott, D.**, Green, M., Bateman, P., Cameron, E. & **Yarnell, R.** Comparative performance of sign surveys, spotlighting, camera trapping and audio playbacks in a landscape-scale carnivore survey. Submitted to Journal of Wildlife Management.

Thorn M., **Scott, D.M.**, Green M., Bateman P., Cameron E. (2009) Camera Trapping as a Means of Estimating Brown Hyaena Occupancy. South African Journal of Wildlife Management. Accepted.

'Walking with Purpose' By Huw Williams in Travel Africa Summer 2008

Academic dissertations:

MSc dissertation, University of Pretoria SA by Nick Ball submitted 2008 (Nick was trained in methods by us before applying techniques at another NP). Earthwatch acknowledged

Digital:

Website up and running

Meetings and conferences:

Oral presentation at the Mammal Society Conference in Easter 2008, audience approx 250 by R. Yarnell

Royal Geographical Society Talk, London Oct 2008. Audience approx 200 by D. Scott

Project Phiri Update, Northwest Parks Board, South Africa Jan 2009. Audience approx 60 by D.Scott & R. Yarnell.

Educational Opportunities

1. Does your project directly or indirectly involve the following groups in your research topic?

- Local communities – Yes

The project engages with local farmers, land owners, parks authority and conservationists in the region. We have many collaborators across the region and also have game rangers involved in our field work and Earthwatch.

- Students – Yes

We have a student from the University of Pretoria doing parallel surveys at Madikwe NP. We also currently have two PhD students and an MRes student working with the project: one on widening the survey area and investigating landowner perceptions; the second looking at ecology and ranging behavior; and the third looking at DNA and the impact of isolation on population viability.

We have also helped students from the local technical college be involved with the survey work and complete study reports on our methodologies. We also take NW Parks students with us during our field work to train them in survey techniques.

- Early career scientists - Yes

We currently have two PhD students involved with aspects of the project.

- Other groups Yes – conservation NGO's

We collaborate with conservationist in local government, and several NGO's including Northwest Parks and Tourism Board, wildlife reserves, wildlife sanctuaries, and small local wildlife groups.

2. How does your research help these groups better understand and act towards the conservation of a sustainable environment? (Please provide specific examples of any activities you are aware of.)

In the future, the project hopes to provide a better understanding of the ecology of brown hyenas inside and outside protected areas. It also hopes to highlight the threats and needs of the different populations for better husbandry and conservation.

Northwest Parks and Tourism Board will receive the first estimates of brown hyena on their reserve and use the data for monitoring and management purposes.

University of Pretoria is keen to establish joint students and to be involved with the joint publication of results. They are assisting us with training students and hopefully future conservationists.

We data-share with DeWildt Cheetah Sanctuary on landowner questionnaires for their own monitoring purposes and have access to the use of survey equipment to expand the study into areas of conservation concern directly relating to their own on-going projects and are keen for collaborative projects in future.

Mankwe Wildlife Reserve will receive the first estimates of brown hyena on their land and use the data for monitoring purposes. They have also helped us to identify other potential threats to the species that haven't been documented before.

3. Has your project contributed to the completion of Masters' or PhD theses or degrees, or other educational research findings?

This project has led to the completion of one Masters' thesis in 2008.

We currently have one masters student from University of Pretoria working on an aspect of brown and spotted hyena interactions in Madikwe GR, one PhD student who is jointly with University of Pretoria and University of Brighton, and another PhD student who is jointly with University of Pretoria and Nottingham Trent University.

Our PhD student Michelle Thorn has now completed her field work and is due to write up her thesis by July 2009. We have a new PhD student starting in 09, Louisa Richmond- Coggan. Both their work has and will help us achieve our overall project objectives.

Other

We are continuing to apply for grants to support the wider aspects of the project. In 2008, we secured a £5,000 Peoples Trust for Endangered Species grant to support sample collection and lab analysis for the genetics investigation. We also secured PhD funding through Nottingham Trent University to investigate the ecology and ranging behaviour of brown hyaenas in more depth.

Acknowledgements

We would like to thank Lynne Levitt, Dougal McTavish, and Louis Phipps, as well as all the support staff at Mankwe Wildlife Reserve. Stephen Dell, Mike Crowther and Peiter Leitner at Pilanesberg National Park, and all other park wardens and landowners who have granted us permission to conduct surveys on their land. Dr Bryony Tolhurst for scientific support during the November team. Michelle Thorn, Lauren Esterhuizen, Louisa Richmond –Coggan and Nancy Baker. We would like to thank our collaborators at the University of Pretoria, and De Wildt Cheetah Sanctuary. Peoples Trust for Endangered Species for a grant to expanding our DNA studies and finally we would like to thank Earthwatch and all Earthwatch volunteers for their support and effort throughout the last year.