Primate and Predator Project Annual Report 2014

Reviewing achievements from the partnership between Durham University, Lajuma Research Centre, the Earthwatch Institute and landowners in the Soutpansberg Mountains
TABLE OF CONTENTS

1. INTRODUCTION .................................................................................................................. 1

2. COMMUNITY ENGAGEMENT AND COMMUNICATION .................................................. 1
   2.1 WORKING WITH YOUNG PEOPLE .................................................................................. 2
      2.1.1 Hyena time children’s book ..................................................................................... 2
      2.1.2 Environmental education ....................................................................................... 3
   2.2 NATURE NIGHT LECTURE ............................................................................................. 4
   2.3 BUYSDORP DISPLAY BOARDS ...................................................................................... 4
   2.4 THROUGH THE LENS WILDLIFE PHOTOGRAPHY EXHIBITION ............................... 6
   2.5 DOWNLOADS PAGE LAUNCHED .................................................................................... 7

3. SCIENTIFIC RESULTS AND DEVELOPMENTS .................................................................. 8
   3.1 PRIMATE DATA ............................................................................................................... 8
      3.1.1 Samango monkey research ..................................................................................... 8
      3.1.2 Vervet monkey research ....................................................................................... 8
      3.1.3 Chacma baboon research ..................................................................................... 9
   3.2 PREDATOR-PREY ECOLOGY .......................................................................................... 12
      3.2.1 Analysis of leopard scats ..................................................................................... 12
      3.2.2 Baboon – leopard interactions through collar data ............................................... 12
   3.3 PREDATOR DATA .......................................................................................................... 13
      3.3.1 Camera trapping .................................................................................................... 13
      3.3.2 Leopard GPS collaring ....................................................................................... 15
      3.3.3 Brown hyaena collar data .................................................................................... 16
      3.3.4 Human–wildlife conflict ...................................................................................... 17
      3.3.5 Brown hyaena scat analysis ................................................................................ 18

4. GENERAL NEWS AND UPCOMING RESEARCH .............................................................. 20
   4.1 INVOLVEMENT IN THE NATIONAL RED LIST ............................................................ 20
   4.2 MEDIA ATTENTION ...................................................................................................... 20
   4.3 PRIMATE RESEARCH COORDINATOR ...................................................................... 20
   4.4 CROWNED EAGLE COLLABORATION ...................................................................... 20

5. EARTHWATCH INSTITUTE INVOLVEMENT .................................................................... 20
   5.1 EARTHWATCH SUMMIT: CITIZENS FOR SCIENCE EXPOSITION ........................... 21
   5.2 SPECIAL GROUPS AT LAIUMA ..................................................................................... 21

6. DONATE TO THE PRIMATE AND PREDATOR PROJECT ................................................. 22

7. THANK YOU .................................................................................................................. 22

8. MORE INFORMATION ....................................................................................................... 23
   8.1 WEBSITES .................................................................................................................... 23

9. CONTACT US .................................................................................................................. 23

10. REFERENCES .................................................................................................................. 23
1. Introduction

The Primate and Predator Project (PPP) was established through a partnership between Durham University and Lajuma Research Centre in early 2011.

The Primate and Predator Project aims:

(i) To assess the role of mountainous regions in biodiversity conservation
(ii) To understand the behavioural ecology of predator-prey interactions focusing on diurnal primates and their predators as a model system
(iii) To evaluate the nature and extent of human-wildlife conflict within the Soutpansberg Mountains

Over the past four years the PPP has developed connections with local landowners, managers, communities, schools and organisations. Through these connections we have constantly endeavoured to build trust and share information in both directions. One of the PPP’s biggest achievements in 2014 has been stronger community engagement through a variety of mediums. This year’s Annual Report will communicate project news and developments with a special emphasis on our community engagement work.

We hope you will enjoy reading this report and sharing in our successes.

2. Community engagement and communication

‘Communication is not a luxury – not a frosting, decoration, or something sprinkled on top – but a necessity for conservation success.’ (Kareiva and Banks, 2014)

One critique of conservation scientists is that their results are not always disseminated back to the local communities that contributed to the knowledge and who could benefit greatly from receiving the final outcomes. Instead results are primarily published in international scientific journals, which are predominantly read by academics living far away. Publishing data is a valuable approach for expanding scientific knowledge and two PPP academic papers were published this year (Coleman and Hill, 2014; Nowak et al., 2014). Additionally two papers are currently in press and will be published in 2015 (Coleman and Hill, In Press; Howlett et al., 2015). However we believe that our work must be shared across multiple levels - internationally, regionally and locally – and our work aims to engage with all of these audiences. Our communication approach has reflected this diversity of stakeholders and this year we have developed creative and interesting approaches to convey our scientific results and share information about how to coexist with wildlife. Sharing the importance of the wildlife living in and around the Soutpansberg Mountains has been a real pleasure and given us an increased feeling of belonging in the local community.
2.1 Working with young people

2.1.1 Hyena time children’s book

Hyenas are frequently depicted in an undesirable light. Negative stereotypes about hyaenas are featured in local traditional African storytelling and Hollywood films alike. Unfortunately these can reinforce misconceptions and a lack of factual knowledge about the species can result in unjustified persecution. To address this fact Katy Williams wrote and illustrated a children’s book entitled *Hyena time* to give young readers a better understanding of the species and to promote a positive view of wildlife. The story is set in the Soutpansberg Mountains and describes how a young brown hyaena meets a human researcher and how they embark on a journey of discovery that transforms misconceptions into understanding and acceptance.

An Earthwatch Shulman Award to Katy Williams funded the production of the book, which was produced in four local languages (English, Afrikaans, Sesotho and Venda). Class sets and teacher’s guides were distributed to 10 local schools and crèches. If you are interested in buying a copy of *Hyena time* in English or Afrikaans, we are selling them for 100 rand to raise funds for the PPP. Please contact Katy Williams for more information. Contact details are at the end of this document.

Following the success of *Hyena time* and under the initiative of PPP Primate Research Coordinator, Caroline Howlett, we are planning to produce a resource for schools about baboons and crop raiding in 2015.
2.1.2 Environmental education

The PPP has been working with the WESSA Eco-Schools programme since 2011. This year all our Earthwatch volunteer teams engaged with local Eco-Schools to deliver environmental education.

We also hosted a special environmental education day for students from Mara Primary School in Buysdorp. Although the property of Buysdorp includes land in the Soutpansberg Mountains, many students had never spent time in the mountains or been exposed to the wildlife of the area. In July we brought a group of students to Lajuma Research Centre for the day. We showed them camera trap photographs of the animals, played games about wildlife, made natural art and conducted a water purity survey in the stream. The children were paired with Earthwatch and PPP volunteers from around the world, which also raised their international awareness.
2.2 Nature Night lecture

In February, we hosted Nature Night in association with two local conservation / research projects. The evening, which was free for members of the public to attend, featured a series of three lectures. Dr Sam Williams from the PPP spoke about leopard population density in the Soutpansberg Mountains. Birthe Linden from the University of Venda and the Samango Monkey Working Group discussed samango monkey research and conservation. David Pretorius from the Blouberg Cape Vulture Project shared information on the endangered Cape vulture. The evening was a great success with over 80 people attending and we are grateful to Schoemansdaal Environmental Education Centre for providing the venue.

We are planning to make Nature Night an annual event and are aiming to host it again in early 2015. Please follow our Facebook page or keep in touch via email for more information.

Figure 4: Sam Williams, PPP Research Coordinator, addresses members of the public at Nature Night.

2.3 Buysdorp display boards

We generate a large volume of images of local wildlife through our wildlife monitoring work with camera traps. Each photograph must be individually examined to determine the species present. For certain species we also identify individual animals using their distinctive coat patterns. This enables us to track animals and estimate population densities. As researchers, we gain an insight into these specific animal’s lives and sometimes develop a personal affinity with them. We wanted to test whether showing photographs and providing information about a particular named animal could help change attitudes in a local community as well.

Between February and October 2014 Katy Williams maintained two display boards in the Buysdorp community. These were situated outside of two local shops, which are frequented regularly by many community members. On a weekly basis we displayed updated printed camera trap photographs and information featuring some of the individually identifiable leopards and brown hyaenas that we
study. The known individuals were intended to act as ambassadors for sharing information on their species as a whole.

In October Katy conducted 52 questionnaires with members of the Buysdorp community to determine how the community had reacted to the boards. Interviews completed at the start of this project were used as a comparable baseline for knowledge levels and attitudes towards hyaenas and leopards.

Most of the people surveyed had seen the boards (65%). Many people stopped to look at the photos every time they visited the shops (40%). A smaller percentage of people took the time to read the information on the boards every time. Some people never read the written information and stated that this was because they were in a hurry, were illiterate or could not read in Afrikaans. Of those who viewed the boards 82% said that they liked the boards very much with 15% of people reporting that they either liked the boards a little bit or were neutral towards them. Importantly, 56% of people surveyed said that they liked brown hyaenas. This attitude was more positive than data collected before the boards were erected when the majority of respondents stated that they disliked brown hyaenas. Some people said that they did not realise that brown hyaenas live in the Soutpansberg until they saw the boards.
The area most people stated that they benefited from was an improved appreciation of nature and wildlife in general (75%). Sixty two per cent of people stated that viewing the boards changed the way they interacted with nature. Many people also said they are less scared of predators now and some said that they would no longer kill leopards or brown hyaenas. The boards also helped viewers to discuss wildlife more with friends and family. There was an overwhelming response that the boards should continue and they are especially important for the young people in the community. It was suggested that in future the boards include more information, incorporate photographs of more species and be shown at additional locations. We will explore the options for this in 2015.

Katy’s Earthwatch Shulman Award funded the display boards and the reviewing work.

2.4 Through the Lens wildlife photography exhibition

As we conduct our camera trapping work, we are constantly amazed at the species biodiversity we record and the quality of the images. The Buysdorp community had been responding extremely positively to the display board images and we believed that sharing camera trap images could have a huge impact on improving attitudes across a wider area.

Our Through the Lens wildlife photography exhibit featured 19 large canvas panels of camera trap images, which showcased the biodiversity of the region and included positive information about how people can live with and benefit from the species portrayed. The exhibit, which was free for members of the public to attend, was displayed for two weeks in Makhado Crossing shopping centre, Louis Trichardt and for three weeks in Delicious coffee shop in Alldays. It also toured a local school and environmental education programme.
One hundred and fifty people or groups of people signed the exhibit’s guestbook. Here are some of the comments people left:

“It’s amazing honestly. I didn’t know we have got such beautiful animals around. I’m glad we have got people around who can do this for us. I’m a black woman and at least I know some animals don’t just attack humans. At least I won’t be so scared of them. Good job.”

“This was incredibly wonderful. I had no idea that we had so many animals in South Africa. These are beautiful pictures.“

“Thanks a lot for this exhibition. Never had I sat down before and wondered just how many species of animals we have here. Best of luck.”

“Wonderful work you are doing. Make people more aware of these animals and how important protecting them is. Most of these animals occur on our plot 5 mins out of town. But diminishing in numbers fast! Constant battle against snares - one of the cruelest methods of obtaining ‘bush meat’.”

“Love the pictures. The beauty of our motherland. Hurray!”

Through the Lens was funded by the Earthwatch Shulman Award, and exhibition space was donated by Makhado Crossing shopping centre and Delicious Coffee Shop.

2.5 Downloads page launched

We are extremely grateful to the many people that support our work, including landowners, funders, stakeholders, and volunteers. We try to make it as easy as possible for everyone to keep up to date with our news (Like our Facebook page! Follow us on Twitter!), but recently we also launched a webpage to make it easier for people to find details of our research and download our
outputs. This includes formal outputs such as academic journal articles, PhD theses and Masters theses, and also links to more informal sources such as newspaper articles and details of coverage on television and websites. So if you ever wondered what comes of our research, head over to http://primateandpredatorproject.wordpress.com/downloads/ to find out!

3. Scientific results and developments

3.1 Primate data

Our primate research is currently focussed on habituated samango monkeys (Cercopithecus mitis erythrarchus), vervet monkeys (Chlorocebus pygerythrus) and chacma baboons (Papio ursinus) that range on Lajuma and neighbouring properties.

3.1.1 Samango monkey research

At Lajuma Research Centre there are two habituated troops of samango monkeys - the House and Barn troops. Since February 2012 the two troops of monkeys have been studied using a uniform methodological procedure developed by the Primate and Predator Project. Researchers follow the monkeys from when they wake up at dawn until they settle in their sleeping sites just after dusk and record scan sample behavioural data every 20 minutes. This data collection continued throughout 2014 to add to long-term understanding of the species.

3.1.1.1 Landscapes of fear research

In mid 2013 Durham University post-doctoral researcher, Dr Kate Nowak, tested how samango monkeys perceive their environment in relation to predation risk, also known as landscape of fear, using an experimental approach called giving-up density. The results of this research were published in July 2014 in the academic journal, Behavioral Ecology (Nowak et al., 2014). Samango monkeys from the two habituated troops felt safest foraging arboreally showing an increased level of comfort as they ascended into the canopy. When human observers were present, the monkeys consumed significantly larger quantities of the test foods indicating that a ‘human shield effect’ exists. These results call into question the neutrality of human observers working with habituated primates (Nowak et al., 2014). The results from this research, as well as earlier work by Dr Ben Coleman published in Animal Behaviour in 2014 (Coleman & Hill, 2014) were presented by Dr Russell Hill at the International Society for Behavioral Ecology (ISBE) in New York in August 2014.

3.1.2 Vervet monkey research

In mid-July we placed a radio collar on an adult female vervet monkey from a small troop based on Lajuma. The collar has enabled our team of research assistants to find the troop and habituate them to the presence of human observers. After several months of following the vervets they have become habituated to our presence and allow us to stay with the troop. This troop is now part of our on-going primate data collection. Every month we aim to collect at least eight full days of data on the vervet monkeys. We gather scan sampling data and take GPS points throughout the day to understand behaviour and map the troop’s home range.
3.1.3 Chacma baboon research

The Primate and Predator Project devised a methodology for baboon data collection based around a combination of scan sampling (data are collected on all individuals sighted within a five minute period) and focal sampling (data are collected on a particular individual’s activities during a ten minute period). Long-term data collection allows the PPP to understand seasonal feeding, ranging and behavioural activity, and also allow us to monitor how baboons respond to significant environmental changes such as clearing fields for crops.

3.1.3.1 A change in baboon ranging behaviour

Since March 2013 a female baboon from the habituated troop has worn a GPS collar, which collects GPS data hourly during the day. These data enable us to accurately map the troop’s home range. Prior to applying the first GPS collar, researchers at Lajuma were only able to gather ranging information by following the baboons. For a number of years the troop heavily occupied areas on Lajuma and properties to the east. However in the past year the troop shifted significantly further to the west, spending less time on Lajuma and almost never returning to the eastern edge of the property (Figure 9). We suspect that this may correlate with the development of crop farming, the loss of natural habitats and an increase in human presence on the eastern side.
Figure 9: Adaptive LoCoH analysis of the baboon troop home range from a) March 2013 – February 2014; b) July – December 2014. Deeper red areas are more intensively used. As study progressed the troop began using eastern areas less intensively (Ottosdal, Bergplatz) western areas more intensively (Onlmoet, Diepkloof and Buysdorp).
3.1.3.2 2D:4D digit ratios in baboons and the effect on dominance, aggression, interest in infants, affiliation and heritability

Some of the behavioural variation between individual baboons of the same sex can be attributed to differences in exposure to sex hormones before birth. Male sex hormones, or androgens, have masculinising and defeminising effects on morphology, brain, and behaviour of animals. Individual differences between the lengths of the second and fourth fingers (2D:4D ratio) represent variation in the levels of androgen a foetus is exposed to in the womb and can be used as an index to measure prenatal androgen effects. Between February and June 2012 Caroline Howlett investigated the relationship 2D:4D ratio and baboon behaviour at Lajuma. The dominance rank amongst female baboons was strongly correlated with the 2D:4D ratio. Individuals with low 2D:4D ratios often exhibited a high rank, lower submission rates and increased aggression. Interest in infants and the rate of affiliative behaviours was not linked to 2D:4D ratios. This may be due to a stronger connection with ovarian hormones. This research also suggested that 2D:4D ratios is linked between mother and infant pairs, indicating a heritable basis. Her findings were accepted for publication this year (Howlett et al., 2015).

3.1.3.3 Crop raiding mitigation fencing

Caroline Howlett is testing the efficiency of a novel fencing technique for keeping baboons and other primates away from crops. Inspired by enclosures used for primates kept in captivity, we hope that this approach may offer an affordable and achievable alternative for local farmers. Variations of the fence are being tested experimentally and results will be made available next year. This research is linked to research conducted by Leah Findlay on commercial farms near the Soutpansberg Mountains for her PhD. Leah’s thesis will be completed in 2015.

Figure 10: Crop raiding baboon (photo: Leah Findlay)
**3.2 Predator-prey ecology**

One of the project’s research aims is to investigate predator-prey relationships. We use a myriad of methods to achieve this including scat analysis, experimental approaches, interacting baboon and leopard collars, and behavioural observations of primates.

**3.2.1 Analysis of leopard scats**

Leanne Fitzgerald is completing her Masters thesis with Durham University, which focuses on leopard diet and activity in the western Soutpansberg Mountains. Leanne analysed camera trap images and scat samples collected over the past several years. She analysed 162 leopard scats to determine the diet of leopards. The majority of the scats contained just a single prey species, with 22 different prey species identified overall. The most commonly consumed prey item was bushbuck with bushpig the second most common prey species. Baboon, common duiker, rock dassie, yellow-spotted dassie and vervet monkey were also common in the scat. The study did not find any livestock or expensive game species present or any other carnivore species.

Data were also examined by grouping the 22 consumed species into size categories showing a preference for prey sized between 20 and 60 kgs.

![Image](image.png)

*Figure 11: Bar chart showing the percentage frequency of occurrence (blue) and relative biomass consumed (red) for each of the four prey size categories; >60kg, 20-60kg, 5-20kg and <5kg.*

**3.2.2 Baboon – leopard interactions through collar data**

Two more habituated baboons were collared this year. These collars communicate with the leopard GPS collars to provide information on areas where predation interactions or attempts occur. This information allows us to map out risky areas for baboons. We are able to determine which time of day leopards come into proximity (around 100 m) with baboons and which habitats are used during predation attempts. The proximity collars within the baboon troop provide information on how the troop reacts to potential predation events. Interactions between the baboon troop and two collared
leopards were recorded on 88 days between 08/07/2013 and 03/07/2014 (Table 1). Nocturnal proximity events are assumed to be caused by leopards moving towards baboons, while diurnal events are possibly due to baboons moving towards leopards.

Table 1. Number of days in which proximity between baboon and leopard collars was recorded. Diurnal events were recorded between 05:00 and 19:00, and nocturnal events were between 19:00 and 05:00.

<table>
<thead>
<tr>
<th>Leopard</th>
<th>Diurnal</th>
<th>Nocturnal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB</td>
<td>34</td>
<td>36</td>
<td>57</td>
</tr>
<tr>
<td>Jenny</td>
<td>21</td>
<td>34</td>
<td>44</td>
</tr>
</tbody>
</table>

This investigation will be continuing into 2015 when we hope to expand our sample size further by collaring five more baboons from an additional troop, and several more leopards.

3.3 Predator data

3.3.1 Camera trapping

3.3.1.1 Leopard densities in the Soutpansberg Mountains

Since mid 2011 the PPP has been camera trapping in the western Soutpansberg Mountains. Through this work we have accumulated a large database of information on leopard sightings.

Data from 2008 concluded that leopard density in the western Soutpansberg Mountains was 10.7 adult leopards per 100 km² (Chase Grey et al. 2013). This is one of the highest leopard population densities recorded outside of state-protected areas in Africa.

More recent data are currently being analysed by the PPP Research Coordinator, Sam Williams. His initial findings indicate that leopard density during early 2014 may have dropped to approximately 5 adult leopards per 100 km². This is significantly lower than the 2008 estimate. In order to ascertain whether this is the result of a constant decline or fluctuating populations, Sam is in the process of determining density estimates for intervals from 2011 to 2013. Our basic data do suggest there has been a steady decline in the number of individual leopards viewed on a monthly basis between 2012 and the end of 2014 (Figure 12) indicating that a corresponding decline in population density is likely.
3.3.1.2 The Limpopo Leopard Project and hunting policy

South African governmental authorities are keen to collaborate with researchers in order to obtain reliable evidence on the population size and trends of leopards in South Africa. Dr Guy Balme and Ross Pitman, researchers from Panthera (a felid conservation organisation), are working with the authorities on the Limpopo Leopard Project, which aims to determine the population trends of leopards across the Limpopo Province. They are surveying multiple sites across the province using camera traps, and they recently asked the Primate and Predator Project to collaborate with them to establish a study site in the Soutpansberg Mountains. The survey will continue for two months each year for a decade, and the data we collect will be used to directly inform leopard management strategies, and ensure that they are sustainable in the long term.

In August 2014 we set out 40 pairs of camera traps across an area of 220 km². We checked the cameras every two weeks until mid October to replace the rechargeable batteries and download the images. We are extremely grateful to the landowners that have granted us access and support for this important project, which we hope to repeat in 2015. The results will complement our current analyses examining leopard population trends in the Soutpansberg. The South African government is drawing up new regulations for the leopard trophy hunting industry across the next few years, which includes new changes to the permit system and a ban on hunting female leopards. Our results will advise on the success of these new policies and inform suggested permit numbers based on scientifically determined population estimates.
3.3.2 Leopard GPS collaring

This year the project GPS collared two adult male leopards named O’Malley and Pimms (Figure 14). We would like to extend our thanks to the landowners who supported this work on their land, namely Ian Gaigher, Stephan and Marianne Fick, and Emmie and Jan Crafford.

The GPS collars we use on leopards and brown hyaenas stay on the animals for 455 days and then they drop off automatically. When the collar reaches day 455, a small pyrotechnic charge is fired and the pin holding the collar is released. We do not have to recapture animals a second time, which is less stressful for the animals and much easier for us. Recovered collars can be recommissioned for future usage at about half the price of buying a new unit.

Sometimes though recovering the collars is not a simple process. If a collared animal moves out of the area, we cannot pick up the signal to track the collar. The batteries on some of our collars have failed before the drop off date, which makes collar recovery near impossible. Luckily recovering a
collar is not the only way to recover the important data. With the leopard, baboon and brown hyaena collars we can download GPS data, activity data and interaction data using a UHF (ultra high frequency) receiver. We try to download regularly throughout the collar’s life so we do not risk losing all the data if we are unable to collect the collar at the end. The leopard collars have an additional mechanism, which helps us to receive data. When a leopard moves into an area with cell phone reception they send text messages listing half of their GPS points to our base station.

BB is a male leopard we collared in mid 2013. The expected drop off date for his collar was mid-August 2014, however despite many attempts to track him with the UHF receiver and to communicate with his collar via SMS, the last data we could get was several months prior. We still photographed BB on our camera traps wearing his collar regularly so we suspected that the reason we were not receiving data was that the collar’s battery had stopped working prematurely. If this was the case finding the collar was going to be impossible. Leopards cover huge areas and walk in places that people do not frequent. Finding a collar that is not emitting a signal would be akin to finding a needle in a haystack. To our complete surprise, we found the needle. The day the collar was due to fall off we received a phone call from the owner of Ontmoet, a nearby farm. His worker had discovered a collar on the road next to the remains of a bushpig kill. Finding it was an amazing stroke of luck and we are indebted to our neighbour, Leon Oosthuizen, for returning it to us.

Another of the leopards that we collared and one collared brown hyaena wore collars were released in December 2014. We believe that these collars may be challenging to recover, either due to suspected malfunction or the sheer distance that brown hyaenas move. If you or anyone you know finds a collar on their land, please contact us immediately. We will be very grateful for its return!

3.3.3 Brown hyaena collar data

In 2013 four brown hyaenas were GPS collared to determine home ranges in and around the Soutpansberg Mountains and to look at how they utilise or avoid different land use types. Unfortunately we were only able to locate two of these individuals again and this was only achieved by flying in a helicopter from the air. Thank you to Jannie Moulman, Eugene Couzyn and the Bateleurs for providing and piloting the helicopters, and providing the financial support required.

Using Minimum Convex Polygon (MCP) analysis (a statistical method) which measures the total area an animal uses, one of the hyaenas utilised 244 km² and the other used an area of 315 km² (Figure 15). This type of analysis does not take into account areas, which are used more intensively, and will often include areas not visited at all; therefore we will be using more sophisticated methods determine brown hyaena home range use in 2015.
The home range of one of the hyaenas seemed to be bounded by natural and manmade barriers. A fast moving road marked the northern edge of his boundary and a river lay at the eastern edge. The other collared hyaena had a core home range, which included two fast moving tar roads. The data suggest that she crossed these roads on a regular basis while the other individual avoided tar roads. We will formally examine road usage and the human impact on hyaena ranging next year. The two collared hyaenas were active from 18:00 to 07:00 with 20:00 to 02:00 as their most active period. Based on 368 nights of data, the average linear distance moved by one of the hyaenas on a night was 17.3 km and the maximum distance recorded in one night was an amazing 37.7 km.

### 3.3.4 Human-wildlife conflict

Unfortunately despite the project’s increase in community engagement, a lot of work is still required to help mitigate human-predator conflict in the area. Humans killed Bill, one of the collared brown hyaenas, in April 2014. In February 2014 the PPP responded to a call for help from a farmer in Buysdorp whose fencing had washed away in the rains. He was concerned that without this barrier, his calves would be targets for leopard predation. The PPP team worked with local people to build a new kraal. There have been no calf fatalities on this farm since the construction was completed.
Another local community, Kranspoort, have turned to the PPP for help with their on-going struggle to protect their livestock from leopard predation. The PPP has been involved with trying to help reduce leopard conflict in Kranspoort since 2013. This year the problem persisted at kraals that the PPP had not previously helped develop. We are currently monitoring problem kraals using camera traps and talking to herdsman about protective fencing ideas. In early 2015 we hope that we will be able to fund some impenetrable fences to safeguard the calves for the community.

3.3.5 Brown hyaena scat analysis

By conducting a literature search we found 12 published studies that examined the dietary contents of brown hyaena scats. The majority of this research was conducted in desert environments such as the Namibian coast or the Kalahari. The average number of scats sampled per study was 135 with 26 as the minimum published sample size (Stuart and Shaughnessy, 1984) and the largest sample size was 383 scats (Mills and Mills, 1978).

As part of Katy Williams’ PhD on human-brown hyaena relationships, the PPP has collected 289 scats, which have been definitively identified as brown hyaena. These scats were collected both within the mountains and on the flat land to the north and south, making it the first comparative brown hyaena dietary survey between these types of habitats and across varied land use types. We are continuing to collect scats and are hoping to acquire an additional 100 samples, which would make this piece of work the largest sample ever examined. Katy is especially interested in collecting more scats from areas found on the flat land near to the Soutpansberg Mountains. If you have samples on your property (see Figure 17 for identification tips) and would like to contribute to this study, please follow these instructions:

1. If you have a GPS, you can complete the below instructions. If you do not have a GPS, but you have samples for collection, please contact Katy Williams so she can come and collect the samples directly (contact details are at the end of this document).
2. Place all scats that are grouped together in a pile into a ziploc plastic bag. If there are multiple small piles of scats, collect each pile in separate bags.

3. Use a permanent marker to write the date collected, the GPS coordinates and the altitude in metres on the bag.

4. Contact Katy to organise collection. Bags of collected scats do not need to be stored in any special way.

Hairs from the scats are extracted and with careful precision, they are turned into microscope slides (Figure 18). A large percentage of the scats collected thus far have been prepared for microscopic examination thanks to Katy Williams, Hannah Birrell, Philippa Goff, Liam Thomas, Carrie Dunford and Erin Williams.

Figure 17: Brown hyaena scat is often white and consists of several small, heavy, roundish balls (left). Hyaenas will frequently defecate in a latrine (right). Each pile of scats found at a latrine should be bagged independently.

Figure 18: Transforming hairs extracted from brown hyaena scats into microscope slides (Photo: Philippa Goff).
4. General news and upcoming research

4.1 Involvement in the national red list

In 2014 the Endangered Wildlife Trust consulted with scientific experts to revise the Mammal Red Data List for South Africa (https://www.ewt.org.za/Reddata/reddata.html). The Red List is a compilation of assessments on all native mammalian species with a specific focus on population trends, threats to the species and action plans for conservation. These assessments are used to classify animals into threatened categories such as critically endangered, endangered, vulnerable or non-threatened categories. This information informs government policy and protection measures.

Primate and Predator Project staff co-authored national red list assessments for the following species: brown hyena, leopard, red duiker, samango monkey, vervet monkey and mongoose species. Our information on brown hyaenas was also included in the IUCN Red List of Threatened Species update. Data on all mammal species recorded on our camera traps were submitted to assist with assessments of all species.

4.2 Media attention

In November the SABC 3 wildlife documentary television programme 50/50 visited the Primate and Predator Project. They filmed an insert about the PPP’s work at Lajuma and our connection with local communities. Some of the footage was aired at the end of December 2014 and the second half of our story will be aired in early 2015. The programme is shown on Sundays at 19:30 on SABC 3 so keep watching.

4.3 Primate Research Coordinator

Since March 2014 Caroline Howlett has filled the role of PPP Primate Research Coordinator. Sadly she will be leaving the project in March 2015 to return to the UK and seek a PhD opportunity. The team at Lajuma will miss her and wish her all the best for her future. A new primate coordinator will hopefully be joining the project in February 2015 to try to fill Caroline’s boots.

4.4 Crowned eagle collaboration

In 2015 the Lajuma Research Centre and the PPP will begin collaboration with the University of Venda to investigate crowned eagle (Stephanoaetus coronatus) diet and movement. These data, which will be primarily led by Dr Stephen Evans of the University of Venda, will help develop a greater understanding of predator-prey ecology in the Soutpansberg and especially in relation to the understudied predation risks that primates face from airborne predators.

5. Earthwatch Institute involvement

The PPP hosts an Earthwatch Institute project called ‘Conserving leopards and monkeys in South Africa’. Several times throughout the year volunteers from around the world work with the PPP for 12 days at a time. Their involvement helps us to achieve our research aims and financially supports the project. Since March 2011 we have led 21 groups.
5.1 Earthwatch Summit: Citizens for Science Exposition

In November 2014 PPP Principal Investigator, Dr Russell Hill, participated in the Earthwatch Summit: Citizens for Science Exposition in Cambridge, Massachusetts, USA, contributing a public lecture, workshop presentation and poster to the event. His topics included “Leopard stories: Conflict and conservation in the Soutpansberg Mountains”, “Engaging the local community to strengthen project outcomes” and “Human-wildlife conflict in the Soutpansberg Region of South Africa”, with the content covering much of the research detailed in this report. Earthwatch and its volunteers remain one of our most important international supporters.

5.2 Special groups at Lajuma

In July a team of volunteers and staff from the Los Angeles Zoo joined our Earthwatch team. Linda Duttenhaver has been providing an incredible opportunity for student volunteers, zoo magnet students and supervising staff from the zoo to join Earthwatch teams for several years. Through this grant, zoo volunteers and students have joined Earthwatch teams all over the world from Thailand to the Amazon and now South Africa. This opportunity gives young people who have a passion for wildlife the chance to experience field research and ecology first hand. Many of the 17 and 18-year-old participants are planning to study in related fields such as veterinary sciences at university. This year the Los Angeles Zoo group selected our project to work with and had a fantastic time taking part in our research.

Figure 19: Earthwatch volunteers from the Los Angeles Zoo at the waterfall on Lajuma.

In 2013 two teachers from Bainbridge High School in Seattle, USA, joined an Earthwatch team. They were inspired by their trip and were determined to offer their students a similar opportunity. In August 2014 the first group of students from Bainbridge High School came to Lajuma and had an incredible experience. The teachers are already planning their return trip for 2015.
In October we contributed towards two Earth Skills Network teams. Staff members from the Earthwatch Institute and Shell worked with PPP staff to lead a dynamic programme based around developing business management skills for protected areas managers. The participants came from Cape Verde, Ghana, the Ivory Coast and South Africa.

This December we led an Earthwatch team for six emerging scientists from across Africa. Participants came from South Africa, Madagascar and Kenya. The group took part in data collection and received training sessions on scientific theory and methodologies from PPP staff members. Everyone learnt a lot and gained experiences, which will be applicable in their developing careers in conservation.

6. Donate to the Primate and Predator Project

The important work we are doing to protect primates, predators and the biodiversity of the Soutpansberg Mountains is not possible without on-going funding. If you would like to donate towards the project please follow these instructions:

Go to the Durham University website (http://www.dur.ac.uk/), click on “Alumni”. When the page opens, click on “Donate” on the left-hand-side. This will open a page, on which they should click on “Other areas of support”. When the page opens, click on “Other areas of support”, and on the “Designation” drop-down box click on “Other” and write in “Primate & Predator Project – Dr R Hill”.

7. Thank you

The Primate and Predator Project is extremely grateful to the following people for their support:

- Professor Ian Gaigher
- Oldrich and Judy van Schalkwyk
- Kyle Stuart
- The landowners in the Soutpansberg Mountains who allow us to work on their land or offer support in other ways
  - Owners, families and staff of Amatola, Bergplaas, Bergtop, Buysdorp, Calitzdorp, Diepkoof, Goro, Koedoesvlei, Kranspoort, Leshiba, Llewellyn, Louisville, Ontmoet, Ottoshoek, Ottosdaal, and Sigurwana, Tolo and Uniondale
  - Peter Breedveld of Sigurwana and Tolo for driving research assistants to check camera traps
- The landowners who assisted the brown hyaena project’s camera trapping research
- Jannie Moulman, Eugene Couzyn and the Bateleurs for donating time and money to help search for collared brown hyaenas and leopards from the air
- The volunteer research assistants who helped with data collection this year
  - Nicolas Guillod, Mira Kajanus, Carson Young, Kaja Helsing, Katie Dobson, Elliot Lustig, Grace Kennedy, Sophie Tuppen, Morgane Costes-Thiere, Shannon Finnegan, Noeks Cilliers, Raphaella Heeson, Rebecca Burlaud, Kasim Rafiq, Leigh West, Tessa Chesonis, Sime Luketa, Hannah Birrell, Philippa Goff, Onnika Oosterbosch, Erin Williams, Zoe Melvin, Liam Thomas, Ryan Scott, Larissa de Clauser, Maelle Lemarie, Carrie Dunford, Josh Canepa and Natasha Coutts
- The veterinarians who helped with darting and collaring
  - Dr Adrian Tordiffe and Dr Cheri-lee Wilson
- The Earthwatch Institute and our Earthwatch volunteers

8. More information

8.1 Websites

Project website: [http://community.dur.ac.uk/r.a.hill/primate_and_predator_project.htm](http://community.dur.ac.uk/r.a.hill/primate_and_predator_project.htm)


Facebook: [https://www.facebook.com/pages/Primate-and-Predator-Project/168026853274442?ref_type=bookmark](https://www.facebook.com/pages/Primate-and-Predator-Project/168026853274442?ref_type=bookmark)

Earthwatch project: [http://www.earthwatch.org/exped/hill_research.html](http://www.earthwatch.org/exped/hill_research.html)

You can find us on Twitter [@PrimatePredator](https://twitter.com/PrimatePredator)

Primate and Predator Project YouTube channel
[http://www.youtube.com/channel/UCp6R2F0SePk_9kEcMdvV0bA](http://www.youtube.com/channel/UCp6R2F0SePk_9kEcMdvV0bA)

9. Contact us

Sam and Katy Williams

Primate and Predator Project
Lajuma Research Centre
PO Box 522, Louis Trichardt (Makhado), 0920, South Africa

Email: primate.predator@durham.ac.uk

Phone: +27 (0) 710557559 or +27 (0) 833087027

10. References


