Primate and Predator Project Annual Report

2016

Reviewing achievements from the partnership between Durham University, Lajuma Research Centre, the Earthwatch Institute and landowners in the Soutpansberg Mountains
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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 to:

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

This report summarises some of the project’s scientific and community based achievements of 2016.

2. Primate and Predator Data Collection

2.1 Publications

Peer reviewed publication is one outlet for the PPP’s scientific findings. Other outlets include newspaper articles, social media platforms and presentations.

In 2016 the following papers were published, or are currently in press by members of the PPP team:


Published papers are available to download from [https://primateandpredatorproject.wordpress.com/downloads/](https://primateandpredatorproject.wordpress.com/downloads/)

**2.2 Primate Data**

Our primate research is currently focused on habituated samango monkeys, vervet monkeys and chacma baboons on Lajuma and its neighbouring properties. We collect behavioural, dietary and ranging data on these species, and conduct habitat and phenological assessments in order to understand changes in food availability. We are also trying to habituate new samango and vervet troops.

**2.2.1 Samango Monkey Research**

At Lajuma Research Centre there are two habituated troops of samango monkeys - the House and Barn groups. Since February 2012 these troops have been followed from when they wake at dawn, until they settle in their sleeping sites just after dusk. Researchers collect behavioural data by scan sampling every 20 minutes, using a uniform methodological procedure developed by the PPP.

**2.2.1.1 Influence of live-capture on risk perceptions of habituated samango monkeys**

Katarzyna Nowak, Shane Richards, Aliza le Roux and Russell Hill

Live-capture of animals is a widely used technique in ecological research, and we employ it here at the PPP to mark individuals, as well as to attach GPS collars. Despite this, the effects of trapping on the risk perception of animals are not often studied. Nevertheless, since it is a widely used technique it is an important study question, particularly considering that the nonlethal effects of risk can significantly influence an animal’s behaviour and distribution. This study used a combination of experimental (giving-up densities) and behavioural (vigilance rates) measures to determine samangos perceived risk, both before and after a period of live-trapping.

Samango monkeys are ‘trap shy’ and it was predicted that trapping would lead to increased anti-predator behaviour by the monkeys (indicated by higher giving-up densities and increased vigilance rates). However, contrary to predictions, live-capture led to no changes in the samangos use of space, vigilance or exploitation of experimental food patches. These results remain relevant for research that uses periodic live-capture and highlight that different species appear to respond to trapping in distinct ways.

**2.2.1.2 Temporal and spatial associations between home range usage and local fruit availability in the samango monkey**

Sarah du Plessis

The aim of Sarah’s research was to identify any temporal and spatial associations between home range use and fruit availability in samango monkeys, to inform future conservation strategy. Such
information on resource preference and landscape features may help to direct conservation strategies in areas threatened by deforestation or habitat fragmentation.

Sarah followed one of the habituated troops of samango monkeys throughout 2015, and used the GPS location points recorded every 20 minutes to produce monthly Utilisation Distributions (UD) for the troop. Within their home range, 580 trees have been tagged, and 29 of these species are known to be eaten by primates in the area. Each month, the fruit, flower and leaf numbers are recorded from each of these tagged trees. The height, diameter at breast height (DBH) and crown diameter are also known for each tree, and Sarah used this information and data on the number and size of trees growing within each habitat to predict the number of fruits in each habitat type per month, and so map monthly fruit-availability.

Sarah then modelled the relationship between fruit availability and samango range use. She found no significant relationship between fruit availability and home range use, despite the severe drought caused by the El Niño event occurring during data collection. This finding supports previous research on samango monkeys, showing that samangos exhibit an active avoidance of high food-resource areas with high predation risks from eagles.

2.2.1.3 The impact of habitat fragmentation on the behavioural ecology and genetic variability of samango monkeys

Ed Parker

Ed has been conducting field work for his PhD at Liverpool John Moores University since 2016. Ed is interested in how the endangered samango monkey adapts to life in highly fragmented and highly seasonal environments. The Soutpansberg Mountains consist of a mosaic of habitat types, including the thin, patchy strips of mistbelt forest on the southern slopes. Samango monkeys are heavily reliant on these patches. The mountain also experiences hot, wet summers, and cool, dry winters, resulting in a wide spatial and temporal availability of food resources. Consequently, Ed is interested in how the home-range size of samango monkeys and day journey length is determined by food availability, climate and measures of primary productivity. On a finer scale, Ed is looking at how samango behaviour varies spatially within the home range, and whether they show stress-related behaviours resulting from life in a fragmented habitat.

The other aspect of Ed’s research concerns samango monkey conservation. Ed is developing samango monkey resource selection functions (RSFs) to indicate where samangos set up their home range (2nd order RSF), how they preferentially select for areas with the home range (3rd order RSF), and what influences their selection of feeding trees (4th order RSF). Finally, Ed is collecting faecal samples of troops in and around the field site at Lajuma to show how a fragmented landscape influences population genetics. These studies will highlight important resources for samangos and indicate whether forest corridors can be utilised to facilitate dispersal, both of which will help to improve samango monkey conservation management.
2.2.2 Vervet Monkey Research

A troop of habituated vervet monkeys is studied continuously throughout the year using similar scan sampling methodologies to the samango research.

2.2.2.1 Alarm calls as measurement for the perceived predation risk of vervet monkeys and its relationship to the vigilance-foraging trade-off

Koen Groenevelt

Fear has a major impact on prey behaviour. Animals often adapt their behaviour based on their perceived predation risk - or landscape of fear: a concept that is incorporated into the Optimal Foraging Theory (OFT). Recent studies have used alarm call rates of primate species to determine the perceived predation risk of habituated primate troops. These calls are very informative for conspecifics and can lead to predator identification, location and deterrence effect. A higher perceived predation risk is thought to be associated with various behavioural changes, but its effects on the vigilance-foraging trade-off that is found in the OFT have yet to be studied in depth.

Koen Groenevelt, a Masters student from the Vrije Universiteit, Amsterdam, studied how perceived predation risk levels alter that trade-off in vervet monkeys. First, he confirmed that this trade-off is present and that vervet monkeys show lower vigilance when they are foraging. He also showed that perceived predation risk does not affect the relationship between vigilance and foraging behaviour. This result was not expected since it was assumed the perceived predation risk measured through the use of alarm calls was a robust method to establish perceived predation risk in vervet monkeys therefore influencing other vervet behaviours.
Results indicate that this assumption might not be correct, as other factors seem to impact alarm call usage in a major way, aside predators. Dominance rank, learning, familial ties and location could all change the way vervet monkeys use their alarm calls. Koen therefore proposes that the assumption that alarm calls function as a way to determine perceived predation risk levels might be wrong, and that it should be studied more directly in order to determine its worth. Including factors described above into the assumption may give a better insight into the credibility of this assumption, before using it to study the effects of fear on other vervet behaviours.

2.2.3 Chacma Baboon Research

The PPP devised a methodology for baboon data collection based on combinations of scan samples (data are collected on all individuals sighted within a five minute period) and focal samples (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 allows us to monitor how baboons respond to significant environmental changes.

2.2.3.1 Can zoo enclosures inform exclosure design for crop-raiding primates?

Caroline Howlett and Russell Hill

Crop-raiding by wildlife is one of the major causes of human-wildlife conflict in Africa, and primates in particular are good at exploiting human-grown foods. Crop-raiding prevention is a complex issue and requires mitigation methods to be tailored towards specific species and situations. Fences provide protection for crops, but their use is often limited by the costs of construction and maintenance. Caroline tested whether a fence design typically used to prevent captive primates from escaping zoo enclosures would prevent wild primates from accessing food.
Three triangular exclosures (3 x 3 x 3 m) were built, each of a different height (2, 3 and 3.5 m) in an open bushveld area. These fences comprised of wire mesh (squares 5 cm²) and eucalyptus poles, topped with a barrier of sheet metal (1 m high, 0.5 mm thick). Each exclosure was baited with 12 oranges piled in the centre of the exclosure, beyond arm’s reach of the baboons. Animals visiting the exclosures were recorded on video using camera traps, and the fences were tested for an eight-day period.

After discovery of the exclosures and oranges, the baboons visited daily until the end of the study. Visits included baboons repeatedly circling the exclosures and active attempts to retrieve the oranges, including climbing and manipulating the fence. Manipulation involved reaching through the mesh, pulling on the mesh, moving the rocks at the bottom of the fence, and digging at the base of the fence. All fence heights proved successful at keeping baboons out. Both habituated and unhabituated baboon troops visited the exclosure, however the habituated troop spent significantly longer periods of time at the exclosures and made more attempts to manipulate the structure to gain access.

This study suggests that crop-raiding by primates can be reduced or even prevented by using relatively simple fencing based on typical zoo-exhibit designs, where a barrier is placed around the top of the fence. Time spent at the exclosures declined over time, suggesting that the baboons became increasingly aware of the inaccessibility of the food. Fences as low as 2 m can be effective at excluding baboons of all age-sex classes.
2.2.3.2 Investigating the differences between methods of behavioural data collection in social network analysis of grooming and aggression networks within a wild baboon troop

Becky Easter

An animal that receives frequent grooming and aggression lives in a very different world from one that receives very little grooming or aggression. Social network analysis allows researchers to understand the role and position of an individual within its society, through the construction of networks – visual maps of interactions – and the analysis of its centrality metrics. It has been shown that social network analyses are greatly affected by the choice of sampling method used to observe the study animals. Becky’s study aimed to understand the effect of the sampling method on the social network analyses for networks of two unambiguous social behaviours in baboon society – grooming and aggression.

Becky used data collected by the PPP over a period of five months (from April to August 2016), with behavioural observations recorded using two different methods – scan sampling and ad libitum sampling. She then constructed sociograms (network graphs) for grooming and aggression behaviours, collected using both methods of sampling, and compared them against each other.

Becky’s results show that sampling method significantly affects network reliability. Ad libitum sampling significantly under-reports the average number of partners individuals have in a grooming network, whilst scan sampling significantly under-represents the extent that individuals in a baboon troop are connected by aggression. Becky’s study also demonstrates the significant differences between the sexes by supporting previously cited predictions that females are central to the grooming network, while males are more central to the aggression network.

2.2.3.3

Andy Allan

Andy has been working for the PPP since February 2015 as the Primate Research Coordinator. However, in October he also registered as a PhD student with Durham University. Andy’s PhD research aims to quantify the producer-scrounger tendencies of individual baboons, and to determine how this influences the information they collect when vigilant. Specifically, Andy is interested in whether the collection of social information is compatible with collecting multiple information types concurrently (e.g., anti-predator, environmental, foreign troop presence).

Beyond this Andy is interested in exploring the individual differences in time spent vigilant and frequency of glances during foraging scenarios. For example, low ranking individuals may reduce the amount of time spent vigilant in order to increase food intake, but frequency of glances could increase (very short routine assessments of the environment) to check that a dominant scrounger isn’t approaching. Andy’s aim is to understand how these dynamics influence the information collected by each individual and its effect on their foraging success. Depending on the context, the results from this study may mean that baboons don’t always need to be actively or routinely vigilant of their environment, the act of monitoring their neighbours may allow them to detect threats efficiently. The results could therefore help explain some of the intricacies of social foraging behaviour in baboons.
2.2.3.4 Social behaviour and stress in chacma baboons

Zina Morbach

Zina arrived at Lajuma in October and is collecting data for her PhD, which she is undertaking at the University of Roehampton, UK. Zina is working on social behaviour and stress in chacma baboons, asking how social behaviour can help individuals deal with everyday stressors and why some individuals are more successful in dealing with these stressors than others. Chacma baboons are a great species to study these questions, as we already know a lot about their social behaviour and the long-term effects of their social relationships. Later on, we might be able to transfer the new knowledge of this study to other species, informing their conservation.

To investigate these questions, Zina and her assistant follow the habituated baboon troop several times a week, collecting data on social behaviours – for example, who they groom and who they fight with. Additionally, she collects faecal samples which will be analysed back in the UK at the University of Roehampton. These samples will help determine the levels of the stress-hormone cortisol within the baboons. Combining the behavioural data with the faecal samples will help determine whether age, sex, or certain social measures (like having good friends) help individuals being less stressed!
2.2.4 Vegetation Research

2.2.4.1 The relative role of three sympatric primate species in seed dispersal in the Soutpansberg Mountains

Simon Stringer

Simon arrived at Lajuma in late December to collect data for his PhD. Simon, from Liverpool John Moores University, UK, is researching seed dispersal effectiveness in the three diurnal primate species here at Lajuma. His PhD is part funded through the AESOP+ scholarship, which is a multidisciplinary and intersectorial Erasmus Mundus consortium, co-coordinated by the University Paul Sabatier-Toulouse 3 in France, and the University of the Western Cape (South Africa). AESOP+ is a partnership composed by 10 European and 8 South African university partners, as well as six additional associate members. Simon will also be collaborating with Lajuma Research Centre in different aspects of his research and is registered at the University of Venda while in South Africa.

Seed dispersal effectiveness (SDE) is a framework that aids in investigating the relative roles of seed dispersers in the community composition of forests. To investigate SDE, Simon will be following habituated groups of the three primate species, collecting data on the tree species they utilise, how they process the fruits and the seeds, and how far seeds are dispersed throughout Lajuma. In addition, Simon will be collecting faecal samples from the primates and identifying and germinating the seeds found within them. This will help determine if seeds passed through the primates’ gut are viable. Combining these methodologies will help understand the relationship between the three primate species and tree composition, as well as identify the key plant species found in the diets of the three primate species.

2.3 Predator-Prey Ecology

Another research aim of the PPP 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 and other prey species.

2.3.1.1 Leopard and baboon interactions

Alec Ayers

Alec is conducting a detailed examination of predator-prey relationships between leopards and baboons at Lajuma. He will be assessing where baboons choose to establish home ranges and where they choose to spend most of their time within their home range, and whether seasonality or leopard occurrence influence where baboons choose to range within these areas. His thesis will also assess whether the nocturnal activity of baboons change throughout the course of a night and seasonally, as a response to environmental variables such as moon brightness, day length, temperature, and wind velocity.
2.3.1.2 The effect of predator activity, weather and habitat variation on activity patterns of rock and bush hyrax in a mountainous environment

Emily Lake

During 2016 Emily completed her Master’s thesis on two species of hyrax (also known as dassies). Predator-prey relationships are multifaceted and Emily’s study aims to expand a keystone concept within predator-prey interactions: the spatial and temporal changes in a prey animal’s behaviour when there is a perceived risk of predation.

The hyrax, a small African mammal, plays an integral role in rocky habitats as a key food source for many predators. The purpose of the study was to test the impact of predation on hyrax using giving-up density (GUD) experiments to establish a landscape of fear. However, due to the absence of interaction from the hyrax with the GUD experiments, a camera trapping protocol was implemented to collect behavioural data on hyrax instead. Emily tested a number of conclusions made within the scientific literature about hyrax, including their classification as a diurnal species, the potential for nocturnal activity and the impact of predation on the diel cycle. Behavioural plasticity with respect to seasonal and environmental changes was also explored, including the extent to which the hyrax displays behavioural thermoregulation.

Bush hyrax

Hyrax showed nocturnal activity, with 8.4% of activity occurring within the dark hours of the 24-hour period. However, predation pressure may be limiting their nocturnal activities in the Soutpansberg Mountains. Hyraxes were also significantly impacted by environmental variables. Activity increased with temperature in all four seasons and rainfall had an immediate effect of reducing activity. Emily also showed that hyrax demonstrate site-specific activities, consistent over time but location-variable.

Emily’s study presents a novel methodology for studying hyrax and has highlighted new information on this understudied species that could have far reaching implications for future studies on hyrax and their predators.
2.4 Predator Data

2.4.1 Camera Trapping

2.4.1.1 Leopard densities in the Soutpansberg Mountains

The conservation status of carnivores is becoming increasingly dire, particularly for larger-bodied species, and the leopard is no exception. Leopards are listed as Vulnerable on the 2016 Global Red List Assessment and there are very few studies that track changes in their population densities, or their threats, particularly outside of state protected areas. The population trends of leopards were so uncertain that leopard trophy hunting was banned in South Africa in 2016 whilst further data was collected. Thanks to our camera trapping efforts we are able to provide assessments on the trends in a population of leopards within the Soutpansberg Mountains, as well as determine the threats to this fluid population.

In order to determine how the leopard population density in the western Soutpansberg is changing over time, the PPP has been continuously monitoring leopard density over an area of approximately 6,000 hectares since 2012. We use an array of 46 camera traps in static locations to photograph leopards, which are then identified on an individual basis using their unique spot pattern. The locations and dates at which different individuals are photographed are used to estimate the population density using spatially explicit capture recapture models. This has allowed us to estimate the density of leopards and assess the population structure six times per year over a period of four years.

The results suggest that the leopard population density in the Soutpansberg Mountains was average compared to other sites in 2012 at 6.55 animals per 100 km$^2$. However, this population has steadily declined by 44% to 3.65 animals per 100 km$^2$ by 2016. The decline appears to be driven by a reduction in the number of adult females, with sub-adults also declining. The high mortality rates were mostly due to illegal human activity. As such we recommend maintaining the ban on trophy hunting in zones such as the Soutpansberg Mountains, where leopards are in decline, as well as continuing research to address the causes of these declines.

![Trends in population density of leopards from 2008 to 2016 within the Soutpansberg Mountains. Population density has been declining at 8% per year since 2008.](image-url)
2.4.1.2 The Limpopo Leopard Project

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 Limpopo Province. They are surveying almost 30 different sites across Limpopo, Mpumalanga and KwaZulu Natal using camera traps. In 2014 Panthera asked the PPP to collaborate with them to establish an approximately 200 km² study site in the Soutpansberg Mountains, named the Luvhondo site, which will record data for two months each year for a decade. The data we collect is used to directly inform leopard management strategies, and ensure that these are sustainable in the long-term.

Between August and October 2014, 31 leopards were photographed. At least one leopard was detected on the majority of the 40 camera stations (93%). Capture-recapture models estimated leopard density at between 5 and 6 leopards per 100 km². Between February and April 2015, 23 leopards were photographed. Between 2014 and 2015 there was a turnover rate of 30% (i.e. 30% of individuals in 2015 were new). Leopard density in 2015 was estimated at just under 5 leopards per 100 km².

The 2016 grid was conducted between 10 March and 30 April. During this period, 26 leopards were photographed at 90% of the camera stations. This included one sub-adult, 3 adults of unknown sex, 14 adult females and 8 adult males. Five of these adults are believed to be over seven years of age, which is an indication of a healthy population. Leopard density in 2016 was estimated at just over 8 leopards per 100 km². Although there has been an increase in leopard density from 2015 to 2016, unfortunately these results are for the Luvhondo study site only – in the rest of Limpopo the leopard population continues to decline. The prolonged drought in the area may be a cause of this increase. Droughts create favorable conditions for predators due to the poor condition of prey and increased scavenging opportunities. This means that the increase may not continue into 2017 – the next survey will shed some more light on this matter.

Philip and Ross Pitman from Panthera busy setting up the 2016 Panthera camera grid.
We are very grateful to all the landowners who support this project and we look forward to working with them again. We have already just started our 2017 survey, so more data to come soon!

2.4.1.3 Meso-predator release of caracals amongst a declining leopard population

Sandi Monger

One of our 2016 predator assistants from Liverpool John Moores University is working with our camera trap data to discover whether the decline in the local leopard population has resulted in an increase in the caracal population. She has just returned home to carry out her data analysis, and will send us her results as soon as she is done. Keep an eye out in the next annual report for her findings.

2.4.2 GPS Collars

2.4.2.1 Suitable leopard habitat

In order to explore the factors limiting the Soutpansberg leopard population in greater detail, we have used data from 8 GPS collared leopards to explore the parts of the mountains that appear most suitable for leopards based on where we obtain GPS fixes. The analyses highlight that the forested habitats are important for the leopards, as are those with denser vegetation, which means that the summer slopes are critically important to the species. Furthermore it is obvious that the low-lying farming areas are relatively unsuitable for leopards, such that dispersal out of the mountains is difficult. Indeed it is the farming and community areas on the boundaries of the mountains that represent the greatest sources of human induced mortality, and as a consequence it is where we have been investing our engagement effort.

2.4.3 Brown Hyena

2.4.3.1 Human-brown hyena relationships and the role of mountainous environments as refuges in a postcolonial landscape

Katy Williams

Humans and brown hyenas frequently interact within a shifting landscape of conflict and cohabitation, yet the social and biological dimensions of these relationships, particularly in montane environments, are rarely studied. Katy’s PhD thesis investigated how attitudes and perceptions towards brown hyenas varied between different socio-economic groups within a postcolonial framework, and how these perceptions related to brown hyena occupancy, density, spatial ecology and diet. Katy used a combination of interviews, participant observation, camera trapping, GPS telemetry and scat analysis for her data collection.

Members of three socio-economic groups ascribe acceptable behavioural and geographic expectations to predators. Violation of these expectations by predators strip power from people and reduce acceptance levels towards them. Regaining power and mimicking concepts of colonial domination over land were key themes in human-predator relationships. Although the brown hyena’s elusive nature and people’s strong abhorrence towards leopards partially protects hyenas from attracting attention as a problem animal, anthropogenic threats still abound. The most important factor determining brown hyena occupancy was avoiding human activity. Despite
due to their large home ranges (95 km$^2$ – 170 km$^2$) and dietary adaptability, brown hyenas occupied 79% of the area surveyed.

Brown hyenas have a varied diet, which includes 48 different species. All signs suggest food acquisition through scavenging. This finding is corroborated by a high overlap with leopard diet. With lower human activity and plentiful scavenging opportunities, mountains provide a safe haven for brown hyenas. A robust brown hyena density of 2.56 – 3.63 per 100 km$^2$ occurs in the Soutpansberg Mountains. Recommendations to promote coexistence with hyenas include greater education about brown hyena ecology and their ecosystem services, non-lethal conflict mitigation, and the inclusion of people from diverse socio-economic backgrounds in conservation.

![Brown hyena](image.png)

**3. Community Engagement and Conflict Resolution**

**3.1 Community Engagement**

**3.1.1 Relationship Building**

With the renewal of the Earthwatch-Shell Stakeholder Engagement Fund we were able to sustain the role of Philip Faure as the Community Engagement Officer. In order for conservation engagement to be successful, there needs to be trust between the involved parties. Philip acts as a first point of contact with local stakeholders, and has been busy building relationships with many farmers and landowners over the past 18 months. As expected, some relationships take time to develop, with some landowners often suspicious of conservationists. Nevertheless, by engaging with the local landowners and stakeholders through helping with *Farm Watch* (security), and farm and anti-poaching patrols, Philip has been able to build rapport with numerous landowners. Philip advertises his human-wildlife conflict mitigation call-out services through social media, regular farm visits, and newspaper articles.

Throughout 2016, Philip has established connections with various stakeholders including farmers, government conservation officials, educators, headman and leaders from the local rural villages.
(including the King of Kutama village), and the general public. In the first year of Philip’s role, he met 338 different stakeholders within the region. Now, almost approaching two years, he has met even more stakeholders, but more importantly, has built on existing relationships and gained more trust and credibility from key stakeholders.

Philip has also been busy setting up and presenting the PPPs Living in Harmony exhibition. The exhibition involved a competition for artists to submit artwork that raised awareness for sustainable agricultural practices and local people living in harmony with wildlife, focusing on leopard conservation. We had more than 50 entries, of which 20 were printed and displayed.

![Living in Harmony exhibition displayed at the University of Limpopo.](image)

We held a public vote on our Facebook page to decide on the three winning pictures, which you can see below. The winners received a package of PPP goodies. The exhibition has so far been displayed at the SAWMA annual conference, in the Makhado Crossing mall in Louis Trichardt and at the University of Limpopo. Next year you’ll be able to view the prints in Alldays, at the Delicious café.
First place: Charith Pelpola

Second place: Virginnia Potter

Third place: Marion Schon
3.1.2 Environmental Education

In addition to all this community engagement, Philip has designed and distributed over 100 anti-snaring posters, printed in a range of local languages, and visited several schools to teach children about the impacts of snaring. He has collaborated with Judy van Schalkwyk of WESSA EcoSchools to develop a drama, which is now used at various schools to advocate anti-snaring. Alongside this anti-snaring campaign, Philip also visits local schools to teach children about biodiversity and promote conservation. Last year, 975 environmental education booklets for children, which were written and illustrated by a PPP researcher, were printed and distributed to local schools as part of the environmental education programme. The booklets tell the story of a baboon and how farmers can mitigate against crop losses by this baboon. A colouring-in book fundraised and designed by the Dalton High School Wildlife Club was also printed and distributed during 2016 as another medium to advocate anti-snaring. Both Philip and Judy distributed these books. The colouring book tells the story of a little bird that got stuck in a snare and needed the children’s help to be released.

Getting local children excited about environmental education.

3.1.3 Nature Night 2016

On January 29th we hosted Nature Night, a public lecture evening. We started Nature Night in 2014 as a way to share our scientific findings and other local researchers’ work with the community. The evening proved to be very popular, with a great turnout of 87 people in attendance. It was fantastic to see so many students from local schools and universities, as well as other members of the community getting excited about conservation.
Results from the PPPs brown hyena research was discussed by Katy Williams, and two guest speakers from the University of Venda presented their research – Professor Peter Taylor on bats and Dr Stefan Foord on spiders. All the evening’s talks were about species that are generally a bit unpopular (hyenas, spiders and bats), so it was great to change opinions and help members of the public become more interested in these species. Many thanks go to Schoemansdal EEC for providing the venue. We look forward to hosting the night again next year and hope to see you there.

3.2 Conflict Resolution

3.2.1 Human-Predator Conflict Resolution

3.2.1.1 Predator-proof boma building

Philip has invested considerable time in building relationships with farmers, attending farmers markets (where he sometimes established an information stall) and offering to run workshops. Rather than formal workshops, many of the rural communities have simply asked for practical demonstrations of methods to improve animal husbandry, particularly in boma building. As a consequence, we have undertaken a series of demonstrations for individual farmers and their farm staff in response to requests for assistance. Some of these activities have been very successful and have allowed Philip and our project to establish good relationships with farmers in the Kutama communal area and the Kranspoort community. Follow-up conversations with farmers who attended demonstrations suggest that those who now have bomas on their farms have not lost any cattle to predators after the bomas were built. Farmers have also expressed that they no longer use poison or other lethal methods as a result. During 2016, Philip and the PPP team, along with other visitors to the project, built more than 10 bomas for the local community.
Philip showing farmers from the Kranspoort community videos of a leopard unable to get inside a boma they had worked together to build. The team had come across a calf attacked by a leopard on their way to running the demonstration so a predator was known to be in the area. This was very effective in helping the farmers understand the effectiveness of bomas.

3.2.1.2 Livestock guardian dogs

Philip has been advocating the use of Anatolian livestock guarding dogs (LGDs) in the area as a means to mitigate livestock losses from predators. We have also started collaborating with the Endangered Wildlife Trust (EWT) carnivore and LGD project, which will soon be managing property in the Soutpansberg Mountains close to Lajuma. As a result, there will be people on the ground that can actively assist with LGD placements and check-ups. During 2016, Philip placed LGDs with two farmers. We continue to ask for help from farmers in the area experiencing problems with carnivores to take part in further research, which should commence at the end of 2017. This research aims to determine the impacts of LGDs on local wildlife. Farmers who allow us permission to camera trap and study how wildlife interact with the LGDs will receive an LGD free of charge, as well as the veterinary and food costs for their first year. Working in partnership with these farmers and their neighbours, we will assess perceptions of the value of LGDs and how their use changes livestock management practices and reported stock losses. Coupled with information from other studies, we will determine the financial benefits of LGD ownership and work with our ambassadors to disseminate this information to the farming community, with the aim to increase the long-term adoption of LGDs.
Livestock guardian dog with her cattle herd.

3.2.1.3 Density analysis on leopards in the Platjan area

Last year, Philip was the recipient of the 2015/16 Earthwatch Shulman Award. The award was originally going to be used to conduct a large-scale camera trapping survey, focused on the predators involved in human-wildlife conflict. However, due to a number of stolen, vandalised and broken camera traps, the camera grid had to be terminated. Instead, Philip will now conduct a camera trapping survey in the Platjan area, to assess the density of leopards there. The farmers in this area have approached Philip and specifically asked for this data on leopards, so this turns out to be a great opportunity to help and engage with these farmers. The camera survey will go ahead in 2017.

3.2.1.4 Wildlife deaths from snaring continue

Philip continues to take visiting group and our own assistants out to local farms to conduct snare sweeps. This activity involves searching an area for snares and removing them when found. During 2016, Philip and his teams removed more than 100 active snares. Unfortunately, our efforts are not always enough, and during October we failed to save a local leopard from a snare.

On Sunday 16th of October, a team of volunteers visited the Medike Mountain Sanctuary to conduct a snare sweep in a forested area near the Sand River. A total of seventy-five active snares were taken from the bush. Amongst the snares we found two bush buck carcasses, the remains of a juvenile baboon, and a jar of poison hidden away in the brush. The dense concentration of snares suggests this is not subsistence poaching, but instead points towards a larger bushmeat-trade syndicate operating in the area.

The following day, a grim discovery was made of a leopard carcass close to the area of the snare sweep. The carcass was freshly skinned, with numerous dog tracks and footprints surrounding the scene. Coagulated blood around the neck and throat confirms that an illegal snare was the cause of death. LEDET Environmental Compliance and Law Enforcement as well as the South African Police Service are currently investigating the incident.
Freshly skinned leopard carcass found at Medike Mountain Sanctuary.

Wire snaring is a popular harvesting method for bushmeat, given that snares are inexpensive, effective, and easy to obtain, set and conceal. Snares are non-selective and can inflict significant by-catch (i.e. killing animals not intended for consumption). Unfortunately, the impact of snaring on our local wildlife is difficult to quantify due to the secretive nature of bushmeat poaching. Landowners often don’t know about snares on their land and poachers often move away from an area abandoning active snares. Snaring can especially impact large carnivore populations, such as the leopards in the Soutpansberg Mountains, because they are wide ranging (have a high probability of running into an abandoned snare), occur in low densities (have large territories), and are long-lived (only reaching sexual maturity after 2 years of age).

The general public can help by removing snares when found in the field and by reporting incidents of poaching directly to LEDET. In addition, landowners can get their employees to do a monthly snare sweep on their properties to remove any snares. The PPP have conducted several snare sweeps and removed hundreds of snares from the Soutpansberg Mountains. If you would like assistance from us please contact Philip. Additionally, if you have any questions with regards to our schools outreach, human-wildlife conflict mitigation or community outreach efforts, or if you would like to make a donation to one of our community projects (whether raising funds for LGDs, school supplies or fencing materials for boma building), then please do not hesitate to contact Philip. Philip can be reached at wildlife.help@durham.ac.uk and through phone or SMS on +27 (0) 718418361.
3.2.2 Human-Primate Conflict Resolution

3.2.2.1 An interdisciplinary evaluation of wildlife crop raiding on commercial crop farms in Limpopo Province, South Africa

Leah Findlay

Understanding and addressing conflict between farmers and wildlife due to crop raiding is of increasing conservation concern. Crop raiding impacts farmers’ livelihoods, reduces tolerance to wildlife and often results in lethal methods of retaliation. Working in partnership with commercial crop farmers, Leah’s thesis was conducted in Blouberg Municipality, South Africa. Using systematic behavioural observations, camera trapping techniques, vegetation transects, interviews and a workshop, this research adopts an interdisciplinary approach to examine farmers’ perceptions of nature, behaviour of primates, and crop damage by other wildlife to understand the nature and extent of crop raiding. This information was used to develop and evaluate effective and locally appropriate deterrents to wildlife crop raiding.

The farmer-baboon relationship is complicated and filled with ambiguity. Farmers are happy to see baboons in the wild, but on the farm baboons are not welcome. High population numbers and the inability to control baboons are particular concerns for commercial farmers. Baboons were the dominant raiders, whose rates of raiding were influenced most by natural food availability. Vervet monkey raiding was also frequent and was influenced by the presence of baboons on the farm. In addition to primates, 18 other wildlife species were observed within crop fields. Farmers’ perceptions of crop raiding animals were influenced by duration of raiding, average group size and overlap between farmer activity and crop raiding. Farmers underestimated crop loss to wildlife, but were able to accurately estimate where most damage occurs.

In light of these results, Leah conducted mitigation trials testing various crop raiding deterrents. The use of bells as an alarm system was not effective at alerting field guards to the presence of vervet raiders, as vervets were able to cross the fences without ringing the bells. Motion-activated sounds were effective at reducing baboon raiding for a short time, but baboons soon habituated. Electric fencing was effective at keeping most wildlife out of crop fields. The information obtained throughout the thesis was used to provide recommendations to commercial crop farmers to reduce crop raiding by wildlife.

4. Visiting Groups

4.1 Earthwatch Institute

4.1.1 Conserving Leopards and Monkeys in South Africa

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. During 2016 we hosted three Earthwatch teams. Sadly these will be the last teams we host on this project, but we will continue working with Earthwatch into the future on other projects.
4.1.2 Community Fellows

During 2016, we received funding to invite two more local ‘change makers’ to join our Earthwatch teams as Community Fellows. The 2016 community fellows were both students. Tumelo Mamabola joined us from the University of Venda where he is a third year student studying zoology and botany. Tumelo was a keen member of the group, often teaching the others (and us!) about local culture, including giving us a full rendition of the South African national anthem during the African quiz night. Tumelo has since been back to the PPP in late 2016 to help out Philip with some of his camera trapping work.

Priscilla Mokgawa joined us from the University of Limpopo, where she is carrying out her Masters on parasitology with Dr Ali Halajian. Priscilla is keen to learn conservation skills that she can take back to her rural community, and she reported that attending the Earthwatch programme has helped her to do this. Thanks to Pam Chesonis for once again funding this valuable opportunity.
4.1.3 Earth Skills Network

In October we once again hosted two Earth Skills Network teams. Staff members from both the Earthwatch Institute and Shell came to Lajuma to lead a dynamic programme based around developing business management skills for managers of protected areas and conservation NGOs. The participants of the course came from South Africa, Zimbabwe, Zambia, Angola, Ghana and Kenya, and even PPP members of staff were kindly invited to join in some of the sessions. These programmes were a great success, with all participants taking back extra knowledge on how to better manage their conservation areas. We look forward to welcoming them back in 2017.

4.2 International School Visits

4.2.1 Bainbridge High School

Brad Lewis and Jason Uitvlugt from Bainbridge High School, near Seattle, USA, returned to Lajuma once more with a group of high school students. Brad has been involved with the PPP since 2013 when he volunteered with Earthwatch together with Jason. The pair were inspired to bring their students to South Africa to assist the PPP and since 2014 this expedition has become an annual opportunity. Plans are already in progress for the group to return again in 2017.

4.2.2 Calverton High School

Brian Sprit and his wife Tomi-Lyn, another duo that visited Lajuma during an Earthwatch project, have also been inspired to bring their own group to Lajuma for a two week visit. Plans are underway for their visit in 2017, and we look forward to welcoming the group here.

4.2.3 Durham University

Once again Durham University Anthropology undergraduates visited Lajuma and the PPP on their 3rd year field trip. Students spent time both at Lajuma, conducting giving up density (GUD) experiments on samango moneys, and on a homestay down in the local village of Indermark, getting involved in daily life. The students were also required to conduct an interview with a member of staff at Lajuma, and Philip and his conflict work proved very popular with the students.

5. General News

5.1 Departures from Lajuma

Brad Lewis left Lajuma in April 2016 after fulfilling a sabbatical year at the PPP. He assisted with statistical analysis, especially of leopard densities, helped supervise research assistants’ projects, and assisted with visiting groups.

After five years of running the PPP, Dr Sam Williams and Katy Williams left with their son Finn. Sam continued to write up data from the project into academic papers, many of which have been published this year, and more will come in 2017. Katy completed writing her PhD thesis, which will be available to the public very soon.

The PPP would like to thank Sam and Katy for all their hard work over the years, and Brad for his significant contribution towards our work. We wish them all the best in their new adventures.
4.2 Arrivals at Lajuma

In June 2016 Dr Leah Findlay replaced Sam and Katy as the Research Coordinator. Leah gained her PhD through Durham University as part of the PPP, focusing on human-primate conflict on commercial farms.

5. Contact Us and Donate

5.1 The PPP can be contacted at:-

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)63 146 0118

5.2 More information about PPP can be found at:-

- Project website: http://community.dur.ac.uk/r.a.hill/primate_and_predator_project.htm
- Project blog: http://primateandpredatorproject.wordpress.com/
- Click to the downloads page to find all our publications: http://primateandpredatorproject.wordpress.com/downloads/
- Facebook page: https://www.facebook.com/pages/Primate-and-Predator-Project/168026853274442?ref_type=bookmark
- Earthwatch project page: http://www.earthwatch.org/exped/hill_research.html
- Project YouTube channel: http://www.youtube.com/channel/UCp6R2F0SePk_9kEcMdvV0bA
- Twitter: @PrimatePredator
- Instagram @primate_predator

5.3 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. Thank you so much to all the individuals and organisations that offered PPP financial support in 2016.

If you would like to donate towards the project please follow these instructions:

Visit https://www.dunelm.org.uk/donations/make-a-donation. Under “Donation Information” select “Other” enter the amount you would like to donate. In the “Comments” section write in “Primate &
6. Thank you

We are extremely grateful to the many people that support our work, including landowners, funders, stakeholders, and volunteers.

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

- Professor Ian Gaigher
- Jabu and Bibi Linden
- Kyle Stuart
- Oldrich and Judy van Schalkwyk
- Brad Lewis
- 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, Diepkloof, Goro, Koedoesvlei, Kranspoort, Leshiba, Llewellyn, Louisville, Ontmoet, Ottoshoek, Ottosdaal, Sigurwana, Tolo, Uniondale and Vierfontein
  - Peter Breedveld of Sigurwana and Tolo for making access possible for our camera trapping grid
- The volunteer research assistants who helped with data collection this year
- Durham University postgraduate students who conducted fieldwork at Lajuma
  - Emily Lake
  - Alec Ayers
  - Katy Williams
- The veterinarian and dog handler who helped with darting and collaring
  - Dr Adrian Tordiffe
  - Gavin Lipjes
- The Earthwatch Institute and our Earthwatch volunteers