Conserving Leopards and Monkeys in South Africa

2014 FIELD REPORT

Background Information

LEAD PI: Russell Hill
REPORT COMPLETED BY: Russell Hill & Katy Williams
PERIOD COVERED BY THIS REPORT: April 2014 - March 2015

CHANGES TO:

PROJECT SCIENTISTS: For 2014, Caroline Howlett has worked as the primate research coordinator on the project, making an invaluable contribution. From March 2015 she is replaced by Andy Allan, who will hopefully be with the project for at least 12 months.
Dear Earthwatch Volunteers

Thank you for your contribution to another busy field season. We achieved a lot this year, although the results have again presented their fair share of challenges and surprises. Our GPS collars are generating a wealth of data on the behaviour and ecology of our study animals. For our baboon population these are showing significant shifts in ranging area (largely away from the new farming areas that are being created), but for the carnivores they are continuing to highlight the risks they face and the high levels of human-induced mortality in the area. We have further confirmation of our leopard population attacking livestock, although our dietary analysis continues to detect no livestock or expensive game. This confirms the need for extensive and ongoing data sets to examine these issues since short-term data sets can be misleading. It also highlights the importance of working with communities to improve their husbandry techniques and construct adequate bomas for their livestock.

But this is just one facet of community engagement. Our Through the Lens photographic exhibition, illustrating local wildlife diversity based on our camera trap images, was fantastically received wherever it was displayed, including its appearance at the WESSA Eco-schools Limpopo Awards Ceremony in early 2015. Katy Williams published her illustrated children’s book Hyena time which was very well received in the local schools. Long-term engagement with communities is critical to our success and is an activity to which we hope Earthwatch volunteers will continue to contribute to in future.

As Earthwatch volunteers, you have processed 63,707 camera trap images, collected 28 predator scats and washed and prepared 90, assessed 1,218 trees for phenology, conducted 44 vegetation plots and collected 5 days of samango behavioural data. We also had 5 successful days teaching environmental education to school children through the Eco-schools programme. With your help we have also built 2 bomas for leopard collaring and built a large enclosure for baboon collaring. You helped us to improve the habitat at our site by removing a cattle fence, an old enclosure and over 100 plastic buckets from the bush. This is all incredibly important work that plays a key role in our research and conservation activities and we value your efforts enormously. Thank you!

Despite our achievements there is clearly still much work for us to do. 2014 continued to point towards a rise in the number of animals we were seeing with snares and many landowners are reporting this as a significant problem that is on the increase. Working with local communities to understand the uses and reasons for snaring will be central to our efforts of addressing this in future. Similarly we need to look at ways of responding to the apparent declines in leopard numbers. But we could not have achieved the understanding we have to date without the contributions of our Earthwatch teams and we are incredibly grateful for your efforts. We hope you continue to follow our work and that we might welcome you back to South Africa again in future.

Best wishes,
Russell
SECTION ONE: Scientific research achievements

TOP HIGHLIGHT FROM THE PAST SEASON
The top highlight of the year has been the general success of our community engagement and outreach activities. From the publication of Katy Williams' illustrated children’s book *Hyena time*, to the success of our *Nature Night* talks and *Through the Lens* photographic exhibition, as well as the engagement with our information display boards in the Buysdorp community, it has been a very successful year. The culminated in the SABC 3 wildlife documentary television programme 50/50 visiting the project in November 2015 to shoot two programmes on our research that aired early in 2015.

REPORTING AGAINST RESEARCH OBJECTIVES
Our project has four long-term objectives, and progress is reviewed under each objective heading.

Objective 1: Evaluating the role of the Soutpansberg Mountains in conserving flagship mammalian species
Our camera trapping grid remains one of our core activities and this continued throughout 2014 and we retain our array of 48 Reconyx Hyperfire HC500 wildlife cameras set in 24 paired camera stations within the western Soutpansberg Mountains. Downloading and monitoring of the images has been an ongoing activity and Earthwatch volunteers have processed over 60000 images in 2014. As in previous years, the photos have continued to reveal a large diversity of species within the region, with a high diversity of carnivore species in particular.

In 2014 we continued to contribute to the Endangered Wildlife Trust’s efforts to revise the Mammal Red Data List for South Africa (https://www.ewt.org.za/Reddata/reddata.html) and update population trends, threats and action plans for the conservation of all mammalian species native to South Africa. The project co-authored national red list assessments for the following species: brown hyaena, 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 and data on all mammal species recorded on our camera traps were submitted to assist with assessments of species where we were not involved in authoring the species profiles.

Objective 2: To assess the extent of actual and perceived human-leopard conflict and the viability of the Soutpansberg leopard population
In 2013 we published data from our research in 2008 that showed that the leopard density in the western Soutpansberg Mountains was 10.7 adult leopards per 100 km² (Chase Grey et al. 2013), one of the highest leopard population densities recorded outside of state-protected areas in Africa. More recently, however, we have been aware of the high levels of mortality in the leopard population, and in a reduction in the number leopard images on our camera traps (Figure 1). As a result, we have started to analyse the corresponding changes in population density. Our initial findings indicate that leopard density during early 2014 may have dropped to approximately 5 adult leopards per 100 km², significantly lower than the 2008 estimate. We are now in the process of determining density estimates for intervals from 2012 to 2014 to fully quantify the nature of the changes. The trends, however, suggest that levels of conflict have increased and that this is having a significant impact on the leopard population. This information is critically important from a management perspective.
Figure 1: Number of individual leopards identified in each 4-month study period 01/01/2012 and 31/08/2014, based on the camera array established in collaboration with Earthwatch.

In 2014 we were approached by Dr Guy Balme and Ross Pitman from Panthera to collaborate with South African governmental authorities to obtain reliable evidence on the population size and trends of leopards in South Africa as part of the Limpopo Leopard Project. We took responsibility for establishing a study area in the Soutpansberg Mountains and in August 2014 we set out 40 pairs of camera traps across an area of 220 km$^2$. Our surveys of this study area will continue for two months each year for the next 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. The South African government is drawing up new regulations for the leopard trophy hunting industry over 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. Results from the initial survey suggested a population density broadly in line with our mountain surveys at 5-6 leopards per 100 km$^2$, although there are some issues for us to explore emerging from methodologies differences in data treatment and cameras used. The 2015 will commence in March 2015 and this will give us a better understanding of the comparability of the data sets.
Since the start of our involvement with Earthwatch we have collected over 500 new leopard scats for analysis, with Earthwatch volunteers collecting 28 last year and washing and preparing 90 scats for analysis. During 2014 a dietary analysis of over 150 leopard scats was undertaken in Durham led by Leanne Fitzgerald, an MSc student looking at the interactions between leopard occupancy, predator and prey behaviour, and diet. The results indicated that 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. As a consequence the study showed that leopards have a clear preference for prey sized between 20 and 60 kgs (Figure 2), consistent with the preferred prey weights reported by other studies. Furthermore, these dietary preference are in part driven by patterns of activity overlap between leopards and their prey species (Fitzgerald et al., in preparation). Our analysis did not find any livestock or expensive game species present or any other carnivore species. In this respect the analysis was similar to work we conducted in 2008, which also found that leopards hunt natural prey almost exclusively, with no evidence of them incorporating livestock or expensive game species in their diets. We are considering integrating the two data sets for publication later in the year. We are also completing a paper on the mismatch between leopard diets and farmer's perceptions, although it is important to recognise that leopards do indeed take livestock and the economic losses are very real for the farmers that experience them.

Figure 2: 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.
This year the project GPS collared two adult male leopards (named O’Malley and Pimms) to increase the information we have on their ranging patterns within the mountains. These data continue to confirm that while leopards predominantly range within the natural habitat within the mountains, they do make regular forays into farming areas and come into contact with livestock. Furthermore, we have continued to confirm evidence of livestock depredation. While this is at odds with our diet analysis, it clearly highlights problems with human-wildlife conflict experience by the landowners. As a result in 2014 we hosted an educational event for the community about living with predators and invested in the construction of additional bomas within local community areas. As stated before this is also an activity we may build formally into our future Earthwatch teams. Following our successful Nature Night talks in 2013 and 2014, coupled with our Through the Lens photographic exhibition, several commercial farmers have been in touch who have encountered depredation by leopards. Community involvement is something we will look to expand further in future years.

From 2012 we started to incorporate brown hyaenas more formally into our population analyses, and deployed four GPS collars on hyaenas as part of Katy Williams’ PhD research. We were only able to locate two of these individuals again and Minimum Convex Polygon (MCP) analysis indicated one of the hyenas utilised 244 km² and the other an area of 315 km². This type of analysis does not take into account areas, which are used more intensively, and will often include areas not visited at all and we will be using more sophisticated methods determine brown hyaena home range use in 2015. The project has also collected nearly 300 brown hyaena scats, from 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 will be analysing these in 2015.

**Objective 3: To evaluate the nature and extent of human-primate conflict within the Soutpansberg mountains**

Much of the work on this objective has continued the core activities from our previous report. Behavioural observations on habituated troops chacma baboons (*Papio ursinus*), vervet monkeys, *Chlorocebus aethiops* and samango monkeys (*Cercopithecus mitis erythrarcus*) are ongoing to assess behaviour, diet and ranging patterns in natural habitat. Earthwatch volunteers have contributed 5 days of behavioural data on one of our habituated study groups. In 2013 volunteers had also contributed to some giving-up density experiments to examine the role that human presence and trapping for collaring has on fear perceptions; the latter element of this work was published this year (Nowak et al., 2014). We will be completing the analysis of the trapping data but the preliminary analysis showed no apparent long-term effects of the activity (despite samango monkeys becoming very trap shy after a single trapping event), which is positive for our ongoing activities.

Although we deployed a VHF collar on a new vervet group in 2014, our plans to deploy further GPS collars on baboons continue to be constrained by significant challenges in successfully trapping sufficient animals. This also resulted in a number of months without a GPS collar in our main study group. Earthwatch volunteers helped us build a new capture enclosure for the year ahead. The GPS collars on baboons are particularly important to provide a comprehensive understanding of the ranging behaviour of the baboons foraging on natural vegetation since this relates to our crop-raiding investigations. Indeed the existing collars are suggesting significant range shifts over time (Figure 3), and we will look to relate these back to our phenology data in due course. Encouragingly the range shift has been away from the new farming areas on Ottosdal.
Earthwatch volunteers continued to contribute to phenological data collection focusing on 20 individual trees from 23 species every month. Earthwatch volunteers assessed 1218 trees for phenology and also conducted 44 vegetation surveys to establish the plant and food species in different habitat types within the study area. These measurements allow us to calculate food availability across the home ranges of the different primate species and so understand seasonal patterns of behaviour. Measures are also taken of habitat visibility and structural habitat characteristics to produce a more comprehensive picture of the vegetation structure at Lajuma.

During 2014 we completed a series of field trials led by a PhD student (Leah Findlay) of mitigation strategies to reduce crop losses to primates in a low-lying farming district near to the Soutpansberg Mountains. Many of the strategies highlighted the challenges of implementing mitigation on a commercial scale, but there do appear to be ways of increasing the efficacy of the guards currently employed by many farmers. However, many farmers prefer to use electric fencing which can have lethal impacts on non-target wildlife. As a consequence Caroline Howlett has tested the efficiency of a novel fencing technique for keeping baboons and other primates away from crops that was based on enclosures used for primates kept in captivity. Although only a pilot the results were positive and will hopefully offer an affordable and achievable alternative for local farmers. The results of both of these studies are being written up in 2015.
Objective 4: To evaluate and mitigate the environmental risks from land reform and land use change

This remains an element of our long-term objectives, although it has not formed a direct focus of our research activities this year. Nevertheless, the work remains embedded in many of the activities we conduct. As a consequence, while we may remove this as a formal objective in due course, the research will continue as part of our other activities.

We continued to develop relationships with two communities living at the base of the Soutpansberg Mountains, one of whom has taken back ownership of the land following a successful land claim. Ongoing activities have included working with one of these communities to improve their livestock bomas to reduce losses to predators, as well as information boards detailing some of our work. Earthwatch, and an Earthwatch Shulman award to Katy Williams, has been critical to supporting this work. We are also now in the process of submitting for publication work from Natasha Constant’s PhD, which was completed in early 2014, since this contains management recommendations and mitigation strategies for minimising stock losses to leopards in the nearby Blouberg Mountains where part of the reserve is under community management.

Our Earthwatch volunteers have been aware of a neighbouring property to our Lajuma base that has been converting natural vegetation to fields for macadamia and avocado farming over the past 2 years. While a disappointing and difficult situation, it will allow us to document in detail how land use changes can influence human wildlife conflict. In previous years volunteers have been involved in monitoring the use of the new fields by the primates as we anticipate witnessing the emergence of crop raiding in future. This year, volunteers have helped us to build new kraals for collaring additional primate groups to monitor their movements, as well as developing new fencing designs based on zoo exhibits to keep primates out of the field. All of these elements will feed into our understanding of the interplay between human-wildlife conflict and land use change.

CHANGES TO RESEARCH PLAN OR OBJECTIVES

There are no significant changes planned to our objectives for the year ahead and the volunteer tasks will remain broadly in line with those for this year. Nevertheless, we are planning a review of our activities in the year ahead and objectives such as the formal focus on land use change may be phased out and replaced with other activities. As noted last year we have been discussing developing a line of research on thick-tailed bushbabies with a team from the US; this has been difficult to take forward initially but we are meeting again to discuss opportunities during 2015. Similarly we have started some work on the poorly studied hyrax species on site (which are important elements of the diet of both the carnivores and raptors) and if successful then elements of this could be expanded. More definitely we are engaging in more regular work within communities assisting with livestock husbandry; something that could be further facilitated if we are successful with our application to the Earthwatch Stakeholder Engagement Fund. Some of these elements could be introduced to the volunteer programme in future years.
SECTION TWO: Impacts

PARTNERSHIPS
This year we established a new partnership with the Limpopo Leopard Project (http://www.limpopoleopardproject.com/) run by Dr Guy Balme and Ross Pitman from Panthera (a felid conservation organisation). We will form part of a 10-yr project to provide reliable information on the population size and trends of leopards in Limpopo Province that will provide the Department of Economic Development, Environment and Tourism (LEDET) the evidence base to modify the regional trophy hunting and DCA (damage causing animal) permit system.

In 2014 we also hosted two Earth Skills Network teams along with staff members from the Earthwatch Institute and Shell mentors; the participants came from Cape Verde, Ghana, the Ivory Coast and South Africa. As a result of this partnership we were invited to submit a grant in early 2015 to the Shell Earthwatch Stakeholder Engagement Fund.

At the same time, our project continues to work in collaboration with a number of partners from previous years to maximise the potential impact and success of our research:

1. Greater Mapungubwe Network: This regional group provides and important forum for discussing issues relating to leopards (and other large carnivores) and primates with local stakeholders and for disseminating our results and recommendations. We have regularly given talks to the network and contributed to their newsletter during 2014.
2. Eco-schools, South Africa: Judy van Schalkwyk is responsible for the Blouberg-Bochum Eco-schools Node providing environmental education to teachers and schools in the region. Earthwatch volunteers contribute to the Eco-schools project through assisting with educational visits at a local school. Our Through the Lens photographic exhibit was also displayed at the WESSA Eco-schools Limpopo Awards Ceremony in early 2015.
3. South African Environmental Observation Network (SAEON): Lajuma Research Centre is an affiliated site of the SAEON network with Oldrich van Schakwyk and Ian Gaigher maintaining on-site weather stations and downloading and transmitting the data. Our project retains the on-site weather data for our use.
4. Vhembe Biosphere Reserve: Ian Gaigher is chair of the biosphere research sub-committee and as a consequence our research feeds directly into the developing research objectives for the biosphere.

CONTRIBUTIONS TO CONVENTIONS, AGENDAS, POLICIES, MANAGEMENT PLANS
• National or regional
Through our involvement as a partner in the Limpopo Leopard Project, we are working with the Limpopo Department of Economic Development, Environment and Tourism (LEDET), other scientists and partners from the hunting industry to develop an adaptive and science-based regulatory system aimed at improving sustainability and identifying conservation priorities for leopard. The project runs a website to offer scientists, hunting outfitters and members of the public the opportunity to keep up-to-date with the latest provincial regulations pertaining to the conservation and utilisation of leopard in Limpopo Province, South Africa.

• Local
The contribution to the Limpopo Leopard Project and its implications for management plans and hunting quotas in the Province also has important implications at local level. During 2014, we have trialed a series of crop-raiding mitigation techniques on commercial farms with the results presented at a baboon crop raiding workshop for local farmers in late 2014. This followed a similar workshop we ran in November 2013. Leah Findlay, the PhD student responsible for this work will be completing her thesis and providing a report and recommendations to the farmers in 2015.
DEVELOPING ENVIRONMENTAL LEADERS
All of 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 (Photos 13-15). 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. We brought a group of children to Lajuma for the day, pairing them with Earthwatch volunteers and project staff from around the world, which also raised their international awareness (see photos included). 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.

In July, a team of volunteers and staff from the Los Angeles Zoo joined our Earthwatch team. Many of the 17 and 18-year-old participants were planning to study in related fields such as veterinary sciences at university, and they were all extremely engaged with the programme. In 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 project staff. We felt everyone learnt a lot and gained experiences which will be applicable in their developing careers in conservation.

In October we contributed towards two Earth Skills Network teams led by staff members from the Earthwatch Institute and Shell in offering 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.

Finally we were able to invite 6 community fellows onto our September team as part of the Chesonis Community Fellow Program. All were school teachers or staff engaged with the WESSA Eco-Schools programme, but many had little direct experience of wildlife. Given the constraints on teacher time, and the difficulty with teachers being away from their schools for more than one week, the community fellows were not able to stay for the full team. But the experience was nevertheless incredibly rewarding for the fellows, our research team and the international Earthwatch volunteers and was important in strengthening our long-term relationship with Eco-Schools.

ACTIONS OR ACTIVITIES THAT ENHANCE NATURAL AND/OR SOCIAL CAPITAL
Our impact in this area has continued build on the activities of previous years. We continue to receive increasing contact from local communities and private landowners who need help to protect their livestock from predation, specifically by leopards. We respond to these calls with visits to farms to meet the farmers and suggest sustainable solutions where we have the resource available, and have applied to the Earthwatch Stakeholder Engagement Fund to build on these initiatives. Our proposed activities will engage with the commercial farmers and traditional community farmers and so we aim to build significantly on the small-scale successes we have had to date. Nevertheless these have been important in raising our profile in the area and increasing the requests we have for assistance.

In 2014, Earthwatch volunteers helped us to improve the habitat for wildlife in the region by removing a old cattle fence and an old enclosure from properties where farming had been a previous land use. We also removed over 100 plastic buckets from the bush that had been left behind by researchers not related to our project.
CONSERVATION OF TAXA

1) Leopard (*Panthera pardus*)
   a. Regionally threatened. Ecologically and culturally significant; Listed as Near Threatened by the IUCN Red List of Threatened Species
   b. Previous studies have suggested that this area has the highest density of leopards on private land in Africa (10.7 per 100km² in 2008: Chase Grey et al. 2013). Our current analyses show a significant reduction in the number of leopards photographed in the mountains (Figure 1), with preliminary population estimates now at 5-6 leopards per 100km²). These results are supported by a high turnover rate in individual leopards, a high mortality rate from our collared animals, all of which indicates instability in the population. Through our increasing involvement with communities we are trying to reduce human-wildlife conflict, with educational and outreach activities to support this work. Our partnerships with Panthera and LEDET will also allow our data to be used in informing future hunting quotas in Limpopo Province.

2) Brown hyaena (*Hyaena brunnea*)
   a. Regionally threatened. Ecologically and culturally significant; Listed as Near Threatened by the IUCN Red List of Threatened Species
   b. There are between 5,000 and 8,000 individuals remaining in the wild worldwide and the population is known to be declining (Wiesel et al., 2014). Little is known about the species in mountainous environments and locally we have no information on the numbers and the trends thus far. We will produce our first density occupancy estimates for the species in 2015.

Our focus is not restricted to these two species, however, and long-term goal is to obtain detailed information on the status of a range of species of local conservation concern: caracal (*Caracal caracal*), civet (*Civettictis civetta*), large spotted genet (*Genetta tigrina*), pangolin (*Manis temminckii*), aardvark (*Orycteropus afer*), bushbuck (*Tragelaphus sylvaticus*), red duiker (*Cephalophus natalensis*) and giant rat (*Cricetomys gambianus*). This will allow us to monitor population trends and examine strategies to conserve and restore species recorded as experiencing significant population declines due to human activity. Our 2012 discovery of wild dogs (*Lycaon pictus*; IUCN endangered) and cheetah (*Acinonyx jubatus*; IUCN vulnerable) highlight the significance of mountainous regions in providing dispersal corridors for some of Africa’s most endangered carnivores. A recent study has suggested the reclassification of samango monkeys (*Cercopithecus mitis erythrarchus*) in the mountains to *C. albogularis schwarzi* (Dalton DL, Linden B, Wimberger K, NupenLJ, Tordiffe ASW, Taylor PJ, et al. (2015) New Insights into Samango Monkey Speciation in South Africa. PLoS ONE 10(3): e0117003. doi:10.1371/journal.pone.0117003), which could increase the conservation significance of the primates in the mountains.

CONSERVATION OF HABITATS

The conservation of habitats is not a specific focus of our project although the maintenance of local habitats and the broader ecoregion is critical to our conservation objectives. Alien vegetation is listed as a threat to the habitats within the Soutpansberg Mountains and we continue to incorporate invasive species removal work (focusing on eucalyptus, loquat and guava) in our Earthwatch teams.

ECOSYSTEM SERVICES

Whilst important, an ecosystem services perspective is not a formal component of our project. In the long-term, however, we do anticipate contributing to reductions in livestock losses to predators in certain areas, and to reductions in crop losses to primates in other regions. Through our research on the conservation significance of the Soutpansberg Mountains we could also enhance the ecotourism potential of the region, particularly in the context of the Vhembe Biosphere Reserve.
CONSERVATION OF CULTURAL HERITAGE
This is not an element of our project, although on the recreational day we do support local artisans who run a culture project. Much of our research work, however, particularly that of PhD students such as Julia Chase Grey (2011), Natasha Constant (2014), Leah Findlay (ongoing) and Katy Williams (ongoing) seeks to understand the cultural dimensions of animal conservation.

IMPACTING LOCAL LIVELIHOODS
The project has employed local people on a temporary basis as translators and these individuals can act as gatekeeper to local communities. As a consequence of the presence of our research assistants and Earthwatch teams, eight local people are hired at the research centre on a permanent basis as cleaners, gardeners and handymen.

LOCAL COMMUNITY ACTIVITIES
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 primarily read by academics. Whilst academic publishing is important for us, 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 (Figure 4). 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.

---

**Figure 4:** Examples of how the PPP has shared research outcomes and conservation information across international, national and local levels in 2014
Between February and October 2014 Katy Williams maintained two display boards in the Buysdorp community (Photo 7), funded by an Earthwatch Shulman award. 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. Katy conducted 52 questionnaires with members of the Buysdorp community in October 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 couldn’t 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.

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, again funded by an Earthwatch Shulman award, was free for members of the public to attend, was displayed for two weeks in Makhado Crossing shopping centre (see Photos 8-12), Louis Trichardt and for three weeks in Delicious coffee shop in Alldays, who both donated the space free of charge. It also toured a local school as part of an environmental education programme, and was displayed at the Eco-schools Limpopo Awards Ceremony in early 2015.

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!”

We will continue similar programmes of engaging with local communities in 2015, since we feel they are essential to our long-term success.
DISSEMINATION OF RESEARCH RESULTS

In review:


In preparation:


• Howlett, C. & Hill, R.A. (in preparation) The efficacy of zoo enclosure designs for excluding primates from farming areas in South Africa. EARTHWATCH ACKNOWLEDGED

• Williams, S.T., Williams, K.S., & Hill, R.A. (in preparation) Sharp declines in of a harvested leopard population within the EARTHWATCH ACKNOWLEDGED

Scientific peer-reviewed publications

We have a downloads page where the majority of our project outputs can be accessed: http://primateandpredatorproject.wordpress.com/downloads/


Grey literature and other dissemination

THESSES:

PRESENTATIONS:
We have made a number of informal presentations by Sam Williams, Katy Williams and Caroline Howlett at the Greater Mapungubwe Network meetings.


POSTERS:

ANNUAL REPORT:
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 (can be downloaded here):

MEDIA:
In November the SABC 3 wildlife documentary television programme 50/50 visited our project to film to episodes about our work in the Soutpansberg Mountains. They can be viewed here:

- https://www.youtube.com/watch?v=z6HpCW4s9Fc&feature=player_embedded
- https://www.youtube.com/watch?v=1Hk1d6AuXvg&feature=youtu.be


SOCIAL MEDIA:
- Project website: www.dur.ac.uk/r.a.hill/primate_and_predator_project.htm
- Blog: http://primateandpredatorproject.wordpress.com/
- Facebook: http://www.facebook.com/pages/Mammal-Conservation-in-South-Africa/168026853274442
- You can find us on Twitter @PrimatePredator
SECTION THREE: Acknowledgements, Funding and Appendices

PROJECT FUNDING
Earthwatch funding has again been critical to our project this year and is a major factor in our success. We are incredibly grateful for the enormous work that goes on behind the scenes in securing support for our project and particularly the contribution from the Chesonis Community Fellow Program. Katy Williams completed the research associated with her Earthwatch Shulman Award in 2014 and the funding was incredibly valuable in promoting community engagement. We have applied to the Shell Earthwatch Stakeholder Engagement Fund to further this work. In March 2014 we received a further $15,000 from a private donor towards project equipment and fuel costs and the association with Earthwatch is undoubtedly a factor contributing to the continued offer of these funds. Durham University also contribution £14000 to project costs and studentship fees. Two Leverhulme Trust project applications, one potentially focussed on developing a new line of research on thick-tailed bushbabies, are now planned for submission in 2015.

ANYTHING ELSE
We repeat the comments we make at this stage in all of our previous annual reports. Our relationship with Earthwatch is exceptionally important to our project and it would be impossible for us to maintain the scope of our current research activities without Earthwatch’s involvement and the contributions of the volunteers. The underwriting that Earthwatch has helped to provide, as well as the relationships with the Chesonis Foundation and the Shell groups are all invaluable and massively appreciated. We that our association with Earthwatch will be a very long-term relationship since we are confident that the partnership has the potential to lead to significant conservation outcomes, particularly in relation to managing human-wildlife conflict.

ACKNOWLEDGEMENTS
• The Earthwatch Institute and our Earthwatch volunteers
• The landowners in the Soutpansberg Mountains who allow us to work on their land or offer support in other ways
  o Owners, families and staff of Amatola, Bergplaas, Bergtop, Buysdorp, Calitzdorp Diepkloof, Goro, Koedoesvlei, Kranspoort, Leshiba, Llewellyn, Louisville, Ontmoet, Ottoshoek, Ottosdaal, and Sigurwana, Tolo and Uniondale
  o 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
  o Nicolas Guillod, Mira Kajanus, Carson Young, Kaja Heising, Katie Dobson, Elliot Lustig, Grace Kennedy, Sophie Tuppen, Morgane Costes-Thiere, Shannon Finnegan, Noeks Cilliers, Raphaela 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
  o Dr Adrian Tordiffe and Dr Cheri-lee Wilson
Photo 1: Students receive copies of Hyaena Time. (Credit K Williams)
Photo 2: Students receive copies of *Hyaena Time*. (Credit K Williams)
Photo 3: Students receive copies of *Hyena Time*. (Credit K Williams)
Photo 4: Students receive copies of *Hyaena Time*. (Credit K Williams)
Photo 5: Teachers receive copies of *Hyaena Time*. (Credit K Williams)
Photo 6: Volunteers at Eco-schools. (Credit K Williams)
Photo 7: Katy Williams and the Buysdorp display boards. (Credit K Williams)
Biodiversity, noun: the number and types of plants and animals that exist in a particular area or in the world generally, or the problem of protecting this.

From aardvarks to zebras, northern Limpopo has an impressively high level of mammalian biodiversity. Many of these animals are rarely sighted or photographed due to their shy nature or nocturnal habits. The Primate and Predator Project (PPP), based at Lajuma Research Centre in the Soutpansberg Mountains, has been able to peak through the lens into the world of our native mammals using motion sensitive cameras. The cameras take photos whenever anything moves in front of them, day or night.

Between April and August 2014 Durham University PhD student and PPP Field Team Leader, Katy Williams, set up 20 cameras across almost 10,000 km². The cameras were placed along the top of the Soutpansberg Mountains and to the north and south of the mountains to capture brown hyena activity. All cameras were set up on private land, which ranged from timber plantations to cattle farms, ecotourism destinations to game farms. Although the aim of the study was to determine brown hyena density and distribution, the study also captured a total of 52 different species of wild mammals and 18 different bird species.

The Primate and Predator Project team were amazed by the number of species found and from an artistic point of view, the beauty and intimacy of these photos. The number of species we photographed pales in comparison to the total number of mammalian and avian species recorded in this area.

We hope you enjoy this exhibition and will help to protect the incredible biodiversity of this region for future generations.

The exhibit was funded by the Earthwatch Shulman Award 2013 / 2014. Thanks to Tessa Chesonis, Shannon Finnegan, Sophie Tuppen, Oldrich van Schalkwyk, the landowners who supported this research and to the exhibition venues.

Photo 8: Through the Lens photographic exhibit. (Credit K Williams)
Photo 9: *Through the Lens* photographic exhibit. (Credit K Williams)
Photo 10: *Through the Lens* photographic exhibit. (Credit K Williams)
Photo 11: Through the Lens photographic exhibit. (Credit K Williams)
Photo 12: *Through the Lens* photographic exhibit. (Credit K Williams)
Photo 13: Environmental education day at Lajuma. (Credit R Hill)
Photo 14: Environmental education day at Lajuma. (Credit R Hill)
Photo 15: Environmental education day at Lajuma. (Credit R Hill)