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**The Leopard - a Key Umbrella Species for Biodiversity Conservation
and Environmental Education in the Western Cape**



**The Cape Leopard Trust Annual Report
2010**

1. Introduction

The Cape Leopard Trust (CLT) was established with the primary objective of facilitating and promoting research in support of conserving predator diversity in the Western and Northern Cape. The conservation strategies include *inter alia*; several bio-geographical research projects, advisory services relating to farmer-predator interactions and supporting of an environmental education component. The latter includes a program of community involvement within the Cederberg and other study areas. We are providing educational camps for school children and consider it imperative that this opportunity to experience the wilderness and learn about the environment be available to children from all backgrounds.

The CLT is a key role player in conservation. One of its fundamental orientations is towards communication, education and public awareness. It creates valuable partnerships with government, NGO's and the public, ensuring facilitation of one of its central goals – to disseminate valuable research information in a manner which creates awareness and educates the public about the importance of a healthy eco-system. The leopard is an iconic species helping to draw attention to broader environmental issues.

2. Research

The CLT has conducted research in four key areas in the Western and Northern Cape, namely; The Greater Cederberg Biodiversity Corridor; The Swartberg - Gamkaberg areas of the Gouritz Corridor; the Boland mountain chain and the mountainous region of Namaqualand (Fig. 2.1). Here we present feedback on the various projects:

2.1. Cederberg

Research on the ecology of leopards in the Cederberg has been ongoing since 2003. This, the first long-term study of its kind in the Western Cape, has made use of modern technology, such as GPS satellite tracking devices and remote camera traps providing valuable insight into the ecology of these elusive animals. Critically, this study has been formalised as a PhD by Quinton Martins through the University of Bristol, U.K. Furthermore, results are being published in peer reviewed scientific journals, and then disseminated in a popular form to the public.

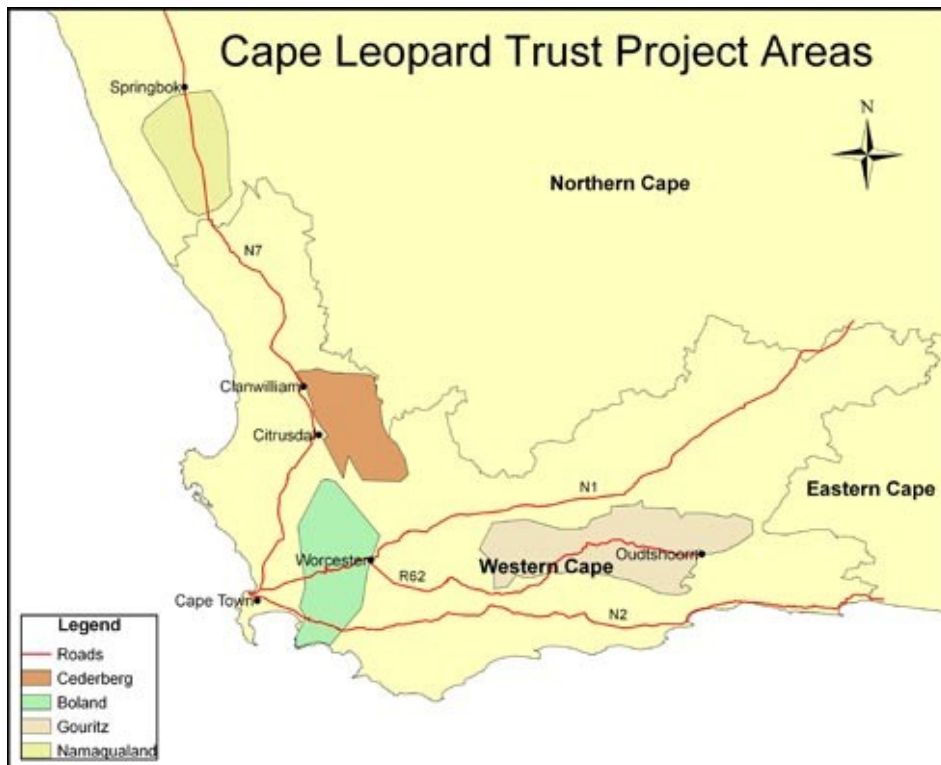


Figure 2.1: Cape Leopard Trust study areas

This year Quinton completed and submitted his PhD thesis, entitled: “The ecology of the leopard *Panthera pardus* in the Cederberg Mountains”. Quinton will travel to the U.K. in January to formalise his doctoral degree. This work has laid the foundation for understanding the ecology of these elusive carnivores, and will contribute to the long-term study of their population – their movements, diet, numbers, breeding behaviour, conservation concerns, and role in the environment. The completed and corrected thesis will be available in February 2011.

A scientific paper was published recently in the international Journal of Zoology, the reference being:

Martins, Q., Horsnell, W.G.C., Titus, W., Rautenbach, T. & Harris, S. (2010). Diet determination of the Cape Mountain leopards using global positioning system location clusters and scat analysis. *Journal of Zoology*, doi:10.1111/j.1469-7998.2010.00757.x.

The paper highlighted a novel approach of diet determination for elusive carnivores in remote and rugged areas such as the Cederberg. GPS location data were used to reconstruct leopard kills made up to 3 years ago. This technique has proved to be very useful for leopards as well as caracal in our studies. We can now establish the total number of prey killed a year by a collared animal – from dassie to larger prey. It

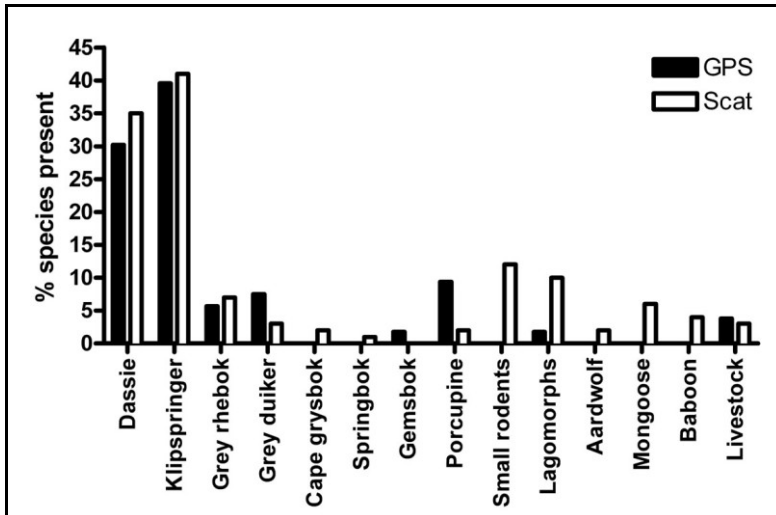


Figure 2.2: Comparison of species recorded in the diet of Cederberg leopards using scat analysis and GPS cluster locations.

also accurately shows how livestock killed by collared predators can be found with a high certainty and that they form an insignificant part of leopard diet (~3%). Using both scat and GPS data it was found that klipspringers and dassies formed 78% of leopards diet in the Cederberg (Fig. 2.2).

Twenty-three species were recorded in the diet of leopards in the Cederberg; similar diversity has been recorded in other studies and is indicative of the generalist feeding behaviour of Cape leopards. However, in terms of biomass consumed, nine species (small rodents, birds and insects) represented <1% of the total diet of

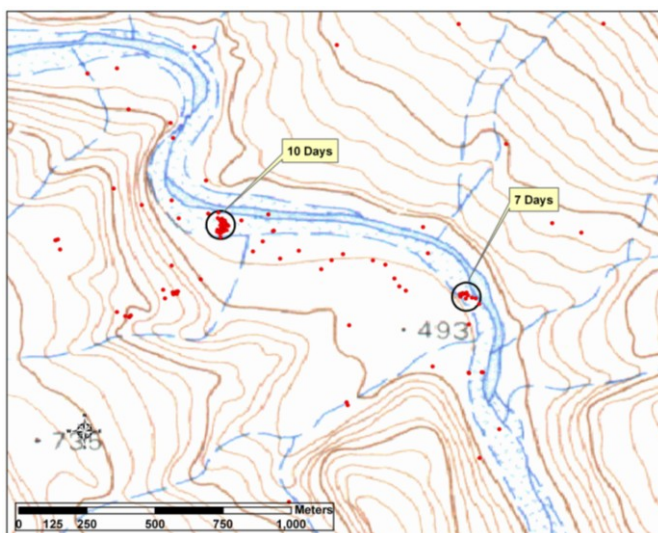


Figure 2.3: Map showing a selection of GPS points (red circles) for leopard M2, including 2 clusters of points circled, one for 10 days, and one for 7 days. These signify large kills of mammals such as cows or donkeys.

leopards. Small antelopes, in particular klipspringer, formed the greater part of the biomass consumed. Furthermore, whereas a previous study in the 1980's showed dassies formed 79% of leopards diet, we found this figure to be considerably lower (34%). Is this because there are fewer dassies now, and have leopard numbers changed? This could be the case, however, long-term monitoring will help better understand these situations.

The prevalence of klipspringers and dassies suggests a preference for leopards hunting in rugged, rocky terrain, the preferred habitat for these prey. In rugged mountain areas where prey is small, predator kills are hard to locate without the assistance of GPS technology.

Using the same GPS technique, we were astounded to see that "Rocky", one of the collared caracals, kills as much, and sometimes more larger prey items like antelope, than the leopards do. We were especially impressed when having investigated a 28 hour kill of his that it turned out to be a black-backed jackal. Not only does it show the intense competition between these predators, but this was also the first record we had of a jackal on the western side of the Wuppertal-Ceres road intersecting the Cederberg.

A sad blow to the project was the loss of Willem Titus working on the project. Willem left in August after 4.5yrs of dedicated and hard work on the project. Apart from his daily duties of servicing and monitoring camera traps and leopard cage traps, Willem spent a substantial amount of time tracking "Rocky". His enthusiasm and tracking skills will be sorely missed on the project and we wish him the best of luck with the road he has taken. Next year we will be training nature conservation students in the Cederberg – 6 month programmes needed to fulfil their course requirements will hopefully provide a good basis for their early career.

2010 has been an amazing year for us in terms of finally having an opportunity to study the breeding behaviour of a female Cape mountain leopard. Spot (F10) whom we had been monitoring using a GPS collar since June 2008, produced a litter of two cubs on the 6th of January 2010. Seven days later we were able to find the den site using GPS in a high, rugged part of her range. Lying side-by-side in a nest of restios well hidden in this boulder-strewn habitat, were two tiny leopard cubs (Fig. 2.4). Being as careful as possible, we spent the following two months intensively monitoring Spot's behaviour, and the well-being of the cubs. Before doing this, we made quite sure that our visit to the den site while mom was

away did not affect her behaviour and cause her to move the cubs. Evidently, the smell of human researchers sweaty after long, arduous hikes in the summer heat did nothing to put her off, and the cubs were left in their den several days after our first visit. We then observed her patterns of moving the cubs on a regular basis. We had sightings of her from afar carrying the cubs to suckle them and witnessed with trepidation how Black Eagles paid an interest in the cries of cubs prior to being fed. Today, over 11 months later, the two cubs are still alive and well. We have had camera traps set up in strategic places to monitor them, and have obtained well over a hundred photographs of them – often very close-up photo's as they are very inquisitive about the camera as can be seen from the photograph below (Fig. 2.5 & 2.6).



Figure 2.4: Spot's two cubs at 7 days old and still with their eyes closed.



Figure 2.5: JUMP! Good exercise for the cubs, playing and fighting.



Figure 2.6: One of Spot's cubs investigating a camera trap, with Tafelberg in the background.

2.2 Boland Project

March 2010 heralded an exciting new chapter for the Cape Leopard Trust. With the addition of two field biologists, Jeannie Hayward and Anita Meyer (both MSc graduates in Zoology from the University of Stellenbosch), the CLT team extended their research activities into the Boland (Fig. 2.7). As newly appointed project coordinators they established, and are currently managing the Cape Leopard Trust Boland Project.

The CLT Boland Project is a very exciting field study of the Cape leopards and mammal populations in the Boland Mountains. The key tools are remote sensing camera traps (digital cameras, containing an infrared sensor triggered by motion and heat). It is one of the largest leopard camera trap surveys in the world – making use of over 80 remote-sensing cameras. Camera-trapping has proved to be a very effective way of estimating the numbers of individually identifiable, elusive and nocturnal animals.

The project extends from the Groot Winterhoek Mountains southwards to the Overstrand coast at Betty's Bay and Kleinmond - an area of well over 300 000ha of spectacular wilderness mountain habitat, visible to millions of people living in the surrounding areas. Much of this is already classified as nature reserve, combined with large areas of privately-owned water-catchments. Due to the large extent of the study area it is divided into three sub-sections, surveyed in phases (Fig. 2.8).



Figure 2.7: Cape Leopard Trust Boland Project coordinators Anita Meyer (right) and Jeannie Hayward (left).

The Limietberg Nature Reserve as well as the adjacent water catchments and privately owned land, (surrounded by the nearby towns of Paarl, Wellington, Franschhoek, Rawsonville and Villiersdorp) form the core area of the central section of the study area and first part of the survey.



Figure 2.8: The CLT Boland Project study area – from the Grootwinterhoek mountains to the Overstrand coast. The area has three sub-areas which are being surveyed in different phases.



Figure 2.9: A total of 21 mammal species have been recorded on camera during the Limietberg Survey. Clockwise from top left – Cape fox, porcupine, klipspringer, caracal, honey badgers and grey rheebuck. Photo records to be entered in the Virtual Museum for Mammals (VIMMA – see later in text).

The first survey ran for three-months starting 6 July 2010 using a total of 46 camera stations (70 cameras, 24 double and 22 single). 21 mammal species were recorded (Fig. 2.9) and an astounding 16 individual leopards identified – 9 males, 5 females, 2 unconfirmed (See Figs 2.10&11). Apart from the identification and subsequent count of individuals, very interesting information has emerged regarding their home-ranges.

The involvement and support from private landowners has been vital to the success of the survey. The majority (26) of camera locations were placed on private land resulting in 18 landowners being involved in the Project. Farmers are generally very interested and supportive of the research activities.

The following area, the Southern Survey, extends from Jonkershoek Nature Reserve near Stellenbosch through the Hottentots-Holland Nature Reserve to the Kogelberg Nature Reserve on the coast. With most of the scouting and groundwork completed, this survey is set to commence mid December – with 90 cameras and 52 camera stations. During the following 3-month period, the Northern Study area will be scouted. After the first cycle is completed, the three surveys will be repeated in the opposite season (i.e. summer vs. winter).

The proximity of the CLT Boland Project study area to Cape Town and a number of major towns is ideal for increasing public awareness. A large component of the Boland team’s work therefore is dissemination of information through talks at

local conservation societies, hiking clubs and 4x4 associations as well as publications in popular magazines and newspapers. Since March, the Boland team have given 17 talks and the project featured in over 10 news articles.

Being well established this is an ideal platform to encourage even broader public involvement. With more landowners being introduced to the project and the use of remote cameras, more interest in obtaining personal cameras has been noted. A major goal for 2011 is the promotion of the web-based mammal distribution atlas, Virtual Museum for Mammals (VIMMA) which was developed during the course of the year in collaboration with the Animal Demography Unit (ADU) at the University of Cape Town (UCT). It enables the public to act as “citizen scientists” by giving them an opportunity to contribute their photographic data to this database.



Figure 2.10. Female leopard, BF2, photographed on a hiking trail near Tweede Tol in the Bainskloof area.



Fig 2.11. Male leopard, BM8, scratching its back against a rock.

2.3 Gouritz Project

2010 has been an exciting one for the Gouritz project. Until this year, the project has mainly focussed on determining the presence of leopards in the area and educating local landowners about leopards and other predators. This work has continued this year, but the project has also branched out in a number of new directions with Gareth Mann doing his PhD (Rhodes University, CLT full scholarship).

The end of April marked the beginning of the first sustained effort to capture and collar leopards in this region. Fitting leopards with GPS collars allows us to gather valuable data essential for the future management of this hitherto unstudied leopard population. We aim to use this information to identify important habitat areas and movement corridors for this leopard population, which will in turn be used to guide conservation management and planning in the region.

Another important aspect of this research is to compare the data to those obtained from the Cederberg leopard population. While the Gouritz region also contains fynbos and karoo vegetation (as well as spekboom thicket), the spatial arrangements of these vegetation types differs to the Cederberg. By comparing and contrasting leopard behaviour in these two very different areas, we'll be able to see

how representative the Cederberg population is of other areas in the Western Cape, which will guide us towards developing a province-wide leopard management plan.

We captured our first leopard at the end of May (Fig. 2.12). 'Zak' is a young adult male who had previously only been photographed on a camera trap over 20km away from the capture site. Zak is quite a character - firstly he was covering a large area of over 400km², secondly he was avoiding a large area in the middle of his range. There were two possible explanations for this; either the central area contained unsuitable habitat, or there was another leopard occupying that area.



Figure 2.12: Aneri Vlok and Gareth Mann with Zak

We had to wait some time to get a definitive answer. Dairen Simpson, a professional trapper from the USA, joined the project in September and October and lent his expertise to help capture Oom Pep. Oom Pep was the first leopard to be photographed by the Cape Leopard Trust's camera traps in the Gouritz region, and appeared to be a large, dominant male. We'd been trying to capture him since April, and with Dairen's help we finally succeeded in late September.

Oom Pep (Fig. 2.14) is a huge male – we weren't able to weigh him accurately because he comfortably exceeded our 50kg scale! Fortunately he wasn't too big for our collar, and we are monitoring his movements with great interest. As suspected, he is occupying the large 'hole' in Zak's territory (Fig. 2.13), and going by their respective sizes one can't blame Zak for giving this monstrous male a wide berth!

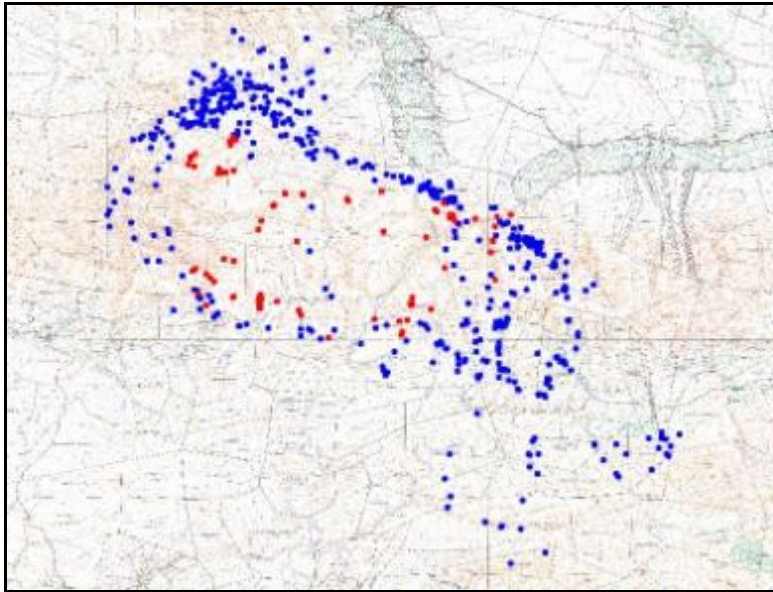


Figure 2.13: The movement patterns of Zak (blue) and Oom Pep (red)

Apart from his movements, Zak had another surprise in store for us – his diet. Although leopards have traditionally been viewed as baboon predators, most research has indicated that they very seldom hunt baboons. This is because baboons are dangerous prey; they live in large groups, and males in particular are very capable of defending themselves against predators. However, this does not appear to have fazed Zak, who has been regularly killing and eating baboons, seemingly during broad daylight!

This makes Zak a great favourite of the local farmers, the majority of whom have been very supportive of the ongoing leopard research in the region. We have regularly met with farmers throughout the year, and have given two presentations at local agricultural association meetings, both attended by approximately 40 local farmers. In addition, we have made numerous visits to local landowners to spread awareness about the research and to educate them about stock protection and predator (and general biodiversity) conservation. We have also had fantastic support from the local CapeNature staff, who have gone out of their way to support us this year. We have provided regular feedback on research activities to CapeNature, both informally and at quarterly meetings.

We recently collared a third leopard, and will monitor his movements with great interest next year. We intend to collar at least 3 more leopards in 2011, while conducting an extensive camera trap survey of the study area. This will not only provide the first ever estimate of the leopard population of this region, but will also

establish a baseline against which future population changes will be monitored. In addition, the camera trap survey will add to our knowledge of local biodiversity patterns, contributing to our goal of contributing to the conservation of a broad range of species, not just leopards.

Fantastic as 2010 has been, 2011 promises to be an even more exciting year for leopard research in the Gouritz region!



Figure 2.14: The big Oom Pep.

2.4 Namaqualand

The Namaqualand Eco-Rangers Project, a new project in Namaqualand, has been initiated by The Cape Leopard Trust in partnership with Conservation SA.

The CLT believes that a robust and reliable technique to keep predators from livestock is through the age-old system of livestock herding. The past 60 years has seen a dramatic move from livestock management to predator management in areas of the Karoo and Northern Cape, much based on the advent of jackal-proof fencing in the 1930s-50s. These methods have not been successful and farmers continue to suffer livestock losses while simultaneously having to cover costs of removing predators. The jackal-proof fences (previously government subsidized) are currently falling into disrepair, are prohibitively expensive and are resulting in massive imbalances in the faunal constituents in these areas, affecting biodiversity and farming production.

The answer is seen in recreating the herding tradition, however, in a modern and more attractive way. Herders, or Eco-Rangers as we call them, will be trained to (i) monitor and protect livestock on private and communal farming areas in Namaqualand; (ii) to monitor and record all faunal activity while in the field with livestock using Cybertracker technology, making use of direct observations as well as spoor; (iii) observe and record feeding habits of livestock in this sensitive environment; (iv) facilitate tourism activities whereby tourists can accompany rangers in the field while on duty; as well as (v) be made aware of the further benefits that could arise from the arts and craft trade.

A training camp was initiated to get the project started. The training course was held in the Kamiesberg Mountains, Namaqualand. Six people participated in the training course, three of them workers on commercial farms and three of them BRI (Biodiversity Red meat Initiative) communal farmers.

The trainees were introduced to the Eco-Ranger concept. They were shown how to collect relevant data on Cybertrackers such as animal tracks, plants, livestock movements, livestock feeding habits, water levels and any other information useful to farmers and conservationists as the programmes sequences. Presentations were conducted on the mammals of the area, mainly using remote camera trap photos taken by the Cape Leopard Trust in Namaqualand and the Cederberg; as well as a comprehensive presentation on the behaviour and biology of predators discussed in the light of livestock farming. The value of maintaining a stable eco-system for the farmers was stressed. Tracking was an important component of the course. Participants were taught to draw animal tracks as a means to recognise them. Artwork using pencil and charcoal drawings is an excellent exercise in observation.

The week's work was finished with a meeting in Kamieskroon with all the role-players to discuss the way forward. It was encouraging to see the positive attitude from all role-players. Each farmer made a commitment as to how they will go forward with their herding as it applies to their situation. The rangers will begin with their monitoring, while plans are afoot to set up the next camp on plant recognition, and finally on livestock husbandry.



Figure 2.14: Lucas (left) and Willem figuring out the Cybertracker; Rangers doing accurate drawings of aardvark tracks



Figure 2.15: From left (back) Brenda, Elmariza, Willem (CLT), Katrina, Lucas, Gert, (front) Willem and Eric with their first charcoal drawings



Education and Outreach Programme



In partnership with:



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The Cape Leopard Trust's (CLT) Environmental Education Programme aims to instil in people a reverence and respect for our natural environment, teaching young people how humans need to find ways of living in harmony with nature and benignly making use of its wealth of resources. The programme provides people, particularly children, with quality experiences that teach them more about the wilderness and themselves. The underlying goal is that they develop an interest in and connection with nature, and therefore inevitably care about protecting our rich biodiversity while simultaneously themselves being enriched.

We believe that experiential learning is more effective than purely academic learning as it involves the person more deeply. This kind of experience can be created effectively on a camp in the wilderness. It is for this reason that the Cape Leopard Trust prioritises the provision of environmental camps. We immerse the participants in various aspects of the Cederberg environment, opening their eyes to the diversity and wonder of nature, and challenging them to overcome their own doubts and fears.

The CLT's Education and Outreach Programme also includes regular environmental appreciation / education excursions for children from local farm schools; day outings for groups visiting the Cederberg as well as school presentations on Cape leopards and other aspects of the natural environment in the Western Cape.

Sponsors

The sponsored camps this year have been funded with the balance of donations made in 2009 by the Three Cities Group, Deutsche Bank Africa Foundation, Whitton Day Nursery and the Claremont Rotary Club. The CLT Education Programme has now received an incredible grant of over R1.3 million for the next three years from the National Lottery Distribution Trust Fund (NLDTF). This will cover most running costs, a new 21-seater vehicle, 32 sponsored camps, equipment and educational materials. We are very grateful for this support.

Environmental Camps

Our campsite at Matjiesrivier, in partnership with Cape Nature, is proving to be an ideal location from which to run the environmental camps. The campsite itself contains important environmental messages, with its bucket showers, dry toilets, and recycling system. As one girl from Herschel said, "I will always stop to think before flushing the toilet." The campsite is designed to be simple yet beautiful.

We have hosted a diversity of groups this year, from a variety of cultural and economic backgrounds, as well as different ages. Every group seems to have had valuable and enjoyable experiences and left with more interest in the environment.

Group	Age	No.	Sponsorship
Pride of Table Mountain Group	Young adults	13	Partial
Grootkloof Primary	10 – 12 year olds	11	Full
Hout Bay High Environmental Club	14 – 17 year olds	17	Partial
Kouebokkeveld Training Centre	Adults	22	None
Eco-rangers training camp, Namaqualand	Adults	8	Full
Zenzeleni Waldorf School	13 year olds	31	Partial
Elizabethfontein Primary School	13 year olds	23	Full
Herschel Prep Girls Eco-Club	10 – 13 year olds	29	None
Women's Weekend 'The Leopard Within'	Adults	9	None
Constantia Waldorf School	11 year olds	29	None
Wupperthal School	15 year olds	17	Full
Stellenbosch Waldorf School	12 year olds	12	None

It is fascinating how there is something challenging for each group; whether it is setting up and sleeping in a tent for the first time, climbing a mountain for the first time, or washing their own dishes for the first time. Often the children have fears that surface during a camp (fear of animals or fear that they cannot manage a particular hike) and it is our challenge to transform those fears into curiosity or possibility.

When, for example, the grade 7s from Zenzeleni arrived, there was a lot of fear about wild animals, particularly snakes. In one of those delightful twists of fate, on the mountain walk we did, a small group of girls saw a snake



lying on a rock just off the path. These particular girls had shuddered when snakes were first mentioned. However, they came racing up the path, glowing with excitement to tell us what they had seen. When asked what they had done when they saw it, if they had screamed and run off, one girl said, “We just stood still and watched it. I wanted to prove that if I didn’t threaten it, it wouldn’t attack me.” For another girl, it was the most beautiful thing she saw on the camp. It is just this kind of essential shift in attitude that these camps allow.

The content of the camps is broad and each programme is tailor made for the group. The theme of the Herschel camp, for example, was biodiversity, and what better place to explore that than on the border between two of the world’s biodiversity hotspots, the Fynbos and the Succulent Karoo. This included close observation of plants through drawing, and finding a scorpion endemic to the Cederberg.



'You have no idea how all the kids are raving about their weekend! What a wonderful time you gave us and how much we learnt!' – Priscilla Beeton (Herschel Girls School teacher)

'What a wonderful weekend! Thank you so much. Your and Anerie's enthusiasm and your knowledge of the area, the flora and fauna and the variety of activities you arranged made it an unforgettable experience for all of us.' – Liz Webster (Herschel Girls School teacher)

Women's Empowerment – 'The Leopard Within'

A new addition this year was our long weekend for women, in which we focused on the leopard as a metaphor, drawing inspiration and insight from the qualities of a leopard, particularly the qualities of Presence, Poise, Power and Purpose. The programme was a balance between experiencing the wilderness through leopard tracking and art and doing more introspective personal development. The weekend was run in English and Afrikaans for a diverse group of women. It was a wonderful weekend and we plan to continue with the programme in 2011.

Local eco-clubs

We have continued to take the children from the Dwarsrivier and Eselbank schools in the Cederberg on outings into the veld. The children have continued to approach their outings with great enthusiasm. A highlight for the Dwarsrivier children was hiking to the Maltese Cross.



Children from the Dwarsrivier School on a hike to the Maltese Cross

Tracking Trips

We have run a number of tracking trips in the Cederberg, both for school groups such as Bishops, and for visitors in the school holidays. These trips have involved learning to recognise animal tracks, discovering interesting creatures, checking camera traps, finding leopard kill sites from the GPS points, and actually tracking the collared leopard ‘Spot’.



This praying mantis that we found is perfectly designed for camouflage in slangbos

Challenges and Plans

Motivating overworked principals and teachers to make the effort to arrange camps has been a difficulty this year. For example, after a presentation to about 30 school principals in the Cederberg region, only one took up the offer of a presentation and sponsored camp. This is frustrating and we are not sure how to approach this effectively.

A number of sponsored camps were booked but cancelled or postponed due to transport issues. We are therefore particularly pleased to have the NLDTF grant for a vehicle, as we will now effectively be able to deal with this issue. We will also be able to offer reasonable transport to paying schools, where transport is equally problematic.

We will be employing someone to help with the camps and transport, as well as setting up an environmental education component in the Cape Peninsula and Boland. The aim will be to reach more children by running convenient day trips that immerse them in the natural environment and highlight the dynamics of the relationships between people and the environment. These day trips will also provide experiential learning to deepen the theoretical work done in classrooms and themes will cover diverse topics such as biodiversity, water, geography, history and geology. More focus will also be placed on doing school presentations on Cape leopards and the mammals of the Western Cape.

Our thanks to everyone involved in helping and supporting the work of the Education Programme. Special thanks to those volunteers who helped with camps and outings: Aneri Vlok, Megan Murgertroyd, Matthew Dowling and Nadia Hansa. Our gratitude to those landowners in the Cederberg who have generously allowed access to their land for education groups, particularly: Cape Nature, Kromrivier, Dwarsrivier, Driehoek and Nuwerust.

Elizabeth Martins

Education and Outreach Programme Co-ordinator

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Thank You

On behalf of the staff, Trustees and our precious environment, thank you for your generous support of our work.

Best wishes for the New Year.

Yours Sincerely,
Quinton

A handwritten signature in black ink, appearing to read 'Quinton Martins', written over a white background.

Quinton Martins
Cape Leopard Trust Project Manager