



# AfriCat Foundation Annual Report



**1 March 2014 – 28 Feb 2016**

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# I: Introduction

## Problem Statement – Why We Do What We Do

Namibia is home to approximately 25% of the world's cheetah population, of which 90% live on farmland. Namibia's other large carnivores, namely leopards, lions, Wild Dogs, brown and spotted hyenas, are not, however, believed to make up such a large percentage of the world's population even though they also all occur in the unique farmland ecosystem. It is the inevitable conflict with humans on commercial and communal farmland that created the necessity for the establishment of the AfriCat Foundation.

Habitat loss is one of the largest threats to the large carnivore populations in Namibia. Over 7,000 commercial livestock and game farms cover approximately 355,000 km<sup>2</sup> and communal land covers an estimated area of 125,000 km<sup>2</sup> of Namibia's total 825,418 km<sup>2</sup>. With the majority of leopards and cheetahs existing in these parts of the country, the resulting conflict between these predators and farmers protecting their livelihood is inevitable as the areas of natural habitat where these animals can safely exist have, consequently, been reduced dramatically.

General predator removal is often the "livestock-protection method" utilised by farmers who view most predators as "problem animals" and cheetahs and leopards are trapped, poisoned, or shot on sight. In most cases, an individual animal is responsible for stock losses and not the species in general and this indiscriminate removal leads to the unnecessary elimination of many blameless animals. Some individual cats are more likely to prey on livestock as opposed to their 'normal' prey diet for a number of reasons, such as being weak, injured, or old. With livestock generally defenceless against such predators, they become a much easier and more appealing kill to cats which may not have the ability to prey on a more natural selection as opposed to the species in general. In addition to this, removing an individual which has killed some livestock does nothing but empty its territory, which will subsequently be filled again by at least one other predator, if not more. In short, it is not solving the problem of livestock predation.

The AfriCat Foundation has recognised this conflict as one of the key issues to successful conservation and sustainable development and has courageously taken up the gauntlet in striving to moderate between the two opposing sides.



## History – The Formation of AfriCat

The AfriCat story started in 1970, when the Hanssen family settled on the farm Okonjima in central Namibia. Brahman cattle were raised on the land but annual losses of calves to predators, particularly leopards, amounted to between 20 and 30 per year, decimating the herd and resulting in huge financial losses. As with many farmers at that time, the Hanssens took the path of trapping, shooting, and hunting leopards in an attempt to minimise their losses. However, these losses continued at the same rate as before. Other measures were employed and calf-holding pens were built at watering holes where cows could give birth safely. The calves remained in protective custody until they were approximately 4 months old with their mothers coming in at regular intervals to feed them. Using this simple livestock protection method reduced losses to about 3 or 4 per year.

Wayne, the only son of the Hanssen family, recognised the need for a better understanding between humans and carnivores. He began observing the leopards, becoming more familiar with their habits and movements. At the same time, the family started a small bed-and-breakfast business and tourists began to visit Okonjima. Wayne's research revealed where leopards could be found and he started to share his viewing experiences with guests. Hunting ceased as more and more guests came to view the big cats at close quarters and Okonjima became a rapidly-growing tourism enterprise.

The AfriCat Foundation was founded in 1991 on Farm Okonjima and officially registered as a non-profit organisation in 1993. AfriCat was created as a result of information gained through Wayne's research on Okonjima during their cattle farming days, the loss of calves to leopards, finding solutions, and the desire to share this information with fellow farmers.

From this platform, farmers throughout the area turned to AfriCat to handle 'problem' cats, often calling AfriCat to their farms to collect animals which they had trapped to protect their livestock. Upon arrival, AfriCat made an effort to persuade the farmers to release the cats but, as an instinctive hatred towards these animals was so engrained, this was often a futile task. Failing to convince farmers to release, AfriCat relocated older cats to the properties of more tolerant farmers, but in cases which involved orphaned cubs, the only viable option was lifelong care by the AfriCat team at their Care Centre.

AfriCat's wilderness camp, AfriCat North (formerly known as Afri-Leo), was registered as a Namibian-based, non-profit organisation in 1997 and has worked closely with the AfriCat Foundation since its founding.

Run by the Hanssen family's eldest daughter, Tammy Hoth-Hanssen, AfriCat North operates in much the same way as AfriCat on Okonjima but instead focuses on lions and spotted hyenas rather than leopards, Wild Dogs, and cheetahs.



Due to the ever-increasing demands of carnivore conservation, these two groups were merged under the AfriCat banner, and Afri-Leo's programmes and projects have continued and expanded under the name of AfriCat North. Its headquarters are ideally situated in north-western Namibia, bordering the Etosha National Park, to play a vital role in supporting Environmental Education, Farmer-Predator/Human-Wildlife Conflict Mitigation & Community Support, and Research and Monitoring Programmes in the Kunene Region of Namibia.

Since AfriCat and AfriCat North's inception, more than 1,100 of these predators have been rescued and over 85% of them were released back into the wild. In addition to the rescue, rehabilitation, and release of these cats, AfriCat provides care for those which cannot be returned to the wild due to a variety of factors such as habituation, loss of hunting skills, and injury, as well as educational opportunities aimed at all ages to promote the long-term conservation of these predators.



## What We Do Now

The AfriCat Foundation prides itself on being an evolving conservation organisation which changes its focus appropriately using various effective methods to meet the conservation needs of large carnivores at any particular time. In 2010, realising that the process of rescue and release alone was becoming outdated, AfriCat identified the need for a shift in focus to 'Conservation through Education'. This new direction seeks to change the mind-set of future generations in order to provide a positive understanding and experience of the country's natural heritage and its Big Cats in particular. AfriCat has organised this new orientation into programmes which will be explained and reported on in detail in section II. They are Research, Carnivore Care, Environmental Education, Rehabilitation and Rescue & Release and Human Wildlife Conflict & Community Support. As all of AfriCat's projects are interconnected, these programmes help to increase awareness amongst the local community as well as globally, and serve as an ambassadorship to the conservation of these carnivores.



## AfriCat's Mission

The AfriCat Foundation's mission is to make a significant contribution to conservation through education and research. It strives to ensure the long-term survival of Namibia's predators in their natural habitat by working with commercial farmers, local communities, communal conservancies, various other stakeholders, and the youth of Namibia. Through its education efforts and wildlife research projects, AfriCat plays a crucial role in increasing our understanding of, and providing sustainable solutions to, conservation challenges in general and human-wildlife conflict and animal welfare issues in particular.



## Who and Where We Are

### AfriCat's Board of Trustees

As the AfriCat Foundation's vision expanded over time, and also pivoted towards research and education, its Board of Trustees was also broadened. A larger, more broad-based Board was appointed in order to be better able to represent the various stakeholders of the Foundation, as well as provide varying skill sets and fresh perspectives to the Foundation.

As such, the AfriCat Foundation's Board comprises:

**Wayne Hanssen:** Founder and Trustee – In addition to being AfriCat's founder, Wayne acts as a Trustee and is involved in the daily running of AfriCat and its 20,000-hectare reserve. Wayne leads the Okonjima team in a tourism venture which offers their clients a high-quality, authentic safari experience, proceeds of which are used for conservation, environmental education, and social responsibility.

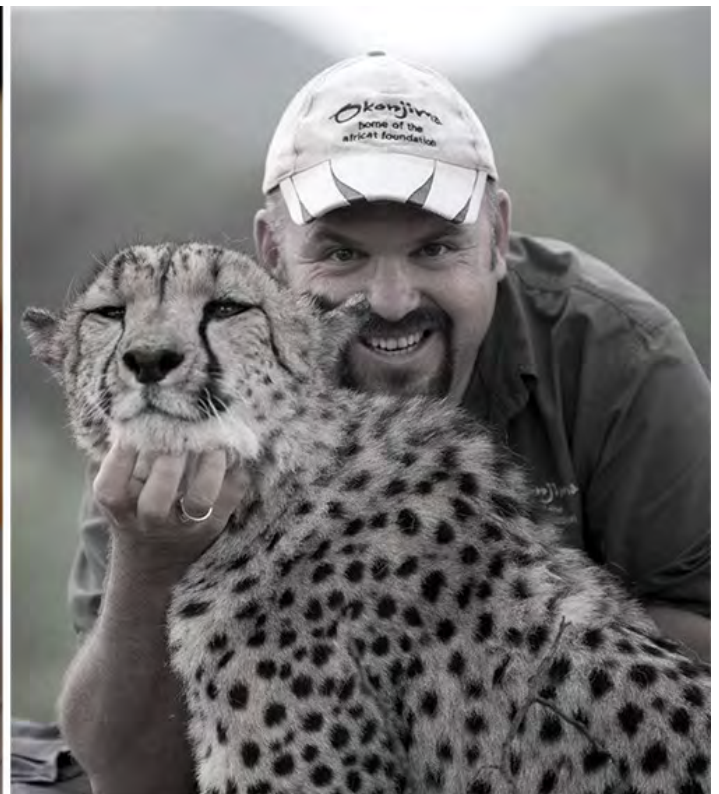


**Tammy Hoth-Hanssen:** Executive Director – Tammy is the public face of the Foundation in Namibia and interacts with the Ministry of Environment and Tourism, as well as with local supporters and donors. She is AfriCat's global representative, attending meetings, presenting public statements, and generally handles its public relations. Tammy is based at AfriCat North, which borders western Etosha National Park. From this location, Tammy heads the Environmental Education, Research, and Human-Wildlife Conflict Mitigation & Community Support Programmes in the Communal Conservancies and wilderness areas of the northwest.

**Mark Reinecke:** Chairperson – Mark’s role as AfriCat’s chairperson involves running board meetings and formulating strategic fund-raising decisions to be made by the organisation, as well as considering all legal matters. Mark and his wife, Karen Codling (Foundation Secretary), are also part owners of some of AfriCat’s rehabilitation lands, located on Farm Ombujongwe.

**Kathleen Newton:** Treasurer – Kathleen ensures that the Foundation remains focused on the conservation and rehabilitation goals, as well as maintaining strong fiscal controls over generously donated funds. In addition, her experience with, and knowledge of, other trusts and her understanding of Namibia's business community, is a valuable asset.

**Karen Codling:** Secretary – As AfriCat’s secretary, Karen is responsible for maintaining the Board records of the Foundation. Her professional experience is grounded in working for and with the United Nations Children’s Emergency Fund (UNICEF) in matters of public policy, maternal & child health, and micronutrient deficiencies. She is also part owner of rehabilitation lands with her husband, Mark Reinecke (chairperson).



**Donna Hanssen:** Trustee – Donna is involved in the daily decision-making and running of AfriCat Head Quarters. She also has brought her considerable skills to bear in the reorganisation of AfriCat, particularly in raising the Foundation's profile and bringing it closer to Okonjima's guests. In addition to increasing awareness among lodge guests, she is responsible for the new image which the Foundation now represents and joins her sister, Tammy Hoth-Hanssen, as the public face of AfriCat internationally.



**Tristan Boehme:** Trustee – Tristan is involved in the daily running of AfriCat and the marketing of the AfriCat Foundation and its legacy with Okonjima guests. He also works on increasing the organisation's public profile in order to stimulate donations. He and Donna work hand in hand to ensure that AfriCat meets its maximum potential in the realm of Carnivore Conservation and Education.

**Dr. Mark Jago:** Trustee – Mark has enjoyed a long and distinguished career in the Namibian Ministry of Environment and Tourism and thereafter founded the Veterinary faculty of the University of Namibia. He has been instrumental in facilitating the AfriCat Foundation to align its work with national policies and regulations on conservation, in general, and carnivores in particular. As a Wildlife Veterinarian, he is constantly aware of the conservation needs of Namibia's fauna and is able to make recommendations with these needs at heart.



**David Farquharson:** AfriCat UK – As a corporate lawyer, David has assisted with the running of AfriCat UK and various works with the Foundation's legal requirements and issues. He also manages AfriCat UK's funds.

## Team AfriCat

The AfriCat Foundation runs smoothly thanks to the team of employees who handle everything from the management and running of the organisation to the care of the animals under AfriCat's protection.

**Selma Amadhila:** Administrator - As AfriCat's office administrator, Selma is responsible for AfriCat's office work, communication throughout the organisation and with potential donors, AfriCat staff issues, as well as overseeing the Carnivore Care Centre and its daily running.

**Louis Heyns:** Field Co-ordinator – Louis is responsible for the rehabilitated animals' welfare in the Okonjima Reserve. He monitors the released and rehabilitated carnivores on a daily basis and maintains the database on their interactions with other animals in the Okonjima Reserve, in collaboration with Okonjima guides.

**Jenny Noack M.Sc.:** AfriCat Researcher and Biologist - Jenny studied biology in Germany and completed her Bachelor of Science at the Freie Universität zu Berlin in 2010 and subsequently specialised in Evolution and Organismic Biology with emphasis on Zoology and Conservation at the Humboldt Universität zu Berlin. Jenny earned a Master of Science degree after a 4-month field project at the AfriCat North headquarters that aimed to investigate the occurrence of large carnivores and their potential prey species via the application of camera traps. Besides coordinating and implementing the current Okonjima/ AfriCat leopard density study, Jenny is assisting with the monitoring of the rehabilitated carnivores in the 20,000 ha Okonjima Nature Reserve and collects data of all the carnivores within the 200km<sup>2</sup> Nature Reserve. She assists with the AfriCat Environmental Education programme and the admin demands of the foundation.



**Dr. David Roberts:** AfriCat Veterinarian 2014 – 2015 – Dr. Roberts was AfriCat's resident vet from 2014 – 2015. He enabled the Foundation to better monitor health issues in the AfriCat Care Centre, conduct more effectively the monitoring of the cheetahs in rehabilitation, and continue with the valuable lion and wild dog research in the field, as well as initiate more



projects - especially pertaining to livestock management, disease control and husbandry in communal farming areas.

**Dr. Diethardt Rodenwoldt:** AfriCat Veterinarian - Dr. Rodenwoldt joined AfriCat in August 2015 and is responsible for monitoring the health and welfare of AfriCat's longer-term residents as well as several of the carnivores in the Okonjima Nature Reserve. Diethardt also takes time out to assist the AfriCat North Lion Research team, immobilising lions designated for collaring as part of the AfriCat Hobatere Lion Research Project (AHLRP). Dr. Rodenwoldt and a number of other veterinary specialists support Team AfriCat in achieving the ultimate goal for wild felines, canines, and herbivores in terms of conservation, education, veterinary care, and research.



**Helen Newmarch:** Environmental Education Coordinator - Helen is responsible for the maintenance, development, and efficient running of the AfriCat Environmental Education Centre. She is also primarily responsible for school visits and liaison of the "Outreach Programme", the daily running of the educational camps, as well as leading most of these camp sessions.

**Daniel Mupunga:** Daniel is the Environmental Education Centre supervisor and lives at the AfriCat Environmental Education Centre. He attends to the basic maintenance and re-



organising of the Environmental Education Centre after each group. He also assists during the education sessions, especially within the Okonjima Nature Reserve. John also works at AfriCat as a Field Assistant and Carnivore Caretaker - his role as Field Assistant and Carnivore Caretaker includes overseeing food preparation, feeding, and daily visual inspection of animal welfare.

**Andries Garab:** Field Assistant and Carnivore Caretaker – Andries' role as Field Assistant and Carnivore Caretaker includes overseeing food preparation, feeding, and daily visual inspection of animal welfare.



**Lukas Hiskia:** Field Assistant and Carnivore Caretaker – Lukas' role as Field Assistant and Carnivore Caretaker includes overseeing food preparation, feeding, and daily visual inspection of animal welfare.

**John Mulyata:** Field Assistant and Carnivore Caretaker – John's role as Field Assistant and Carnivore Caretaker includes overseeing food preparation, feeding, and daily visual inspection of animal welfare.

**Justina Kaghuvi:** Housekeeping and Office Assistant - Justina's role as Housekeeping and Office Assistant includes the maintenance, organisation, and cleanliness of the AfriCat office, kitchen, Clinic, Information Centre, and carnivore food preparation areas.

**Marthinus Alberts:** Projects Co-ordinator of the AfriCat North Human-Wildlife Conflict Mitigation & Community Support Programmes, Marthinus was born on a livestock farm close to the Etosha National Park and is familiar with farmer-predator issues but also understands the need to establish a delicate balance between humans, their land use, and the ecosystem. Marthinus heads the kraal-building and patrol teams and through his own experience is able to advise and encourage the use of improved livestock farming and protection methods.



**German Muzuma, Titus Turitjo, Jackson Kavetu & Uezekandavii Nguezeeta:** The AfriCat Lion Guards - The four Lion Guards of the Ehirovipuka Conservancy were employed by the CCCP (AfriCat's Communal Carnivore Conservation Programme) in March 2012. Their duties include monitoring and reporting on lion whereabouts, reporting incidents, patrolling fences with Ministry of Environment & Tourism (MET), and monitoring and reporting poaching and other illegal activities. They also work closely with local farmers in identifying priority villages for kraal-building, encouraging, and guiding farmers to adopt the AfriCat Livestock Protection programme and carrying the message of Conservation from the highest authorities to the farmer. As German Muzuma is a Traditional Chief in the area, his word is respected and the AfriCat message is therefore heard more readily by the local community.

**Steve Swann:** Projects Co-ordinator of the AfriCat North Human-Wildlife Conflict Mitigation & Community Support Programmes.



## AfriCat Locations

The **AfriCat Foundation** is located just 70 kilometres south of the small town of Otjiwarongo, in the Otjozondjupa Region in Central Namibia; situated on the Hanssen family's cattle farm-turned-Nature Reserve which now operates a 20,000-hectare area in the efforts of long-term carnivore conservation, focusing on the rehabilitation of once-captive cheetahs, environmental education, research and care of cheetahs, leopards, wild dogs, spotted & brown hyenas.







**AfriCat North** is AfriCat's wilderness base, located in north-western Namibia, bordering the Etosha National Park (ENP). AfriCat North is ideally situated in close proximity to the Communal Conservancies along Etosha's south-western, western and north-western borders, supporting these farmers through improved livestock management and protection programmes, ultimately reducing livestock loss to large carnivores, in particular lions. In so doing, these programmes mitigate the farmer-lion conflict, reducing the number of lions destroyed. From this base, the Hobatere Lion Research Project and Environmental Education programmes continue to support the long-term survival of Namibia's lions.





AfriCat UK represents the AfriCat Foundation in the United Kingdom. It is a registered charity and undertakes fundraising and awareness activities for the AfriCat Foundation. It also maintains a membership database of AfriCat supporters in the UK, maintaining their links with AfriCat and keeping them informed of AfriCat developments and achievements. Chris Packham, a well-known British naturalist, nature photographer, television presenter and author and Lorraine Kelly, a Scottish television presenter, journalist and actress, are AfriCat's patron.

### Main Activities

AfriCat UK has spent many busy years spreading the conservation message, raising awareness of our work, increasing the size of our e-database, encouraging visits to Okonjima as well as many fundraising efforts. AfriCat UK attended the Destination Travel show with the support of the Namibian Tourist Board, and one of the main reasons for attending was to increase visitors to Okonjima and it helped to add people to our e-database. We now have over 1,000 entries in the database for the first time.



The AfriCat Story at Framestore, London in October was a highly successful event with a question and answer session with patron Lorraine Kelly and a presentation on the history of AfriCat. The funds raised from ticket sales and the raffle went to support AfriCat's work of the Lion Guards.



Sponsored runs: James Tomlinson ran the London Marathon in April 2015, Lorraine Brookes ran Nottingham half marathon in September 2015 and Phoebe Anderson successfully completing the 10K run in Richmond Park - many thanks to all for their effort, hard work and the money raised.

Talks: AfriCat was invited by Safari Drive to give a presentation at their Open Day and promoted visits to Okonjima, useful feedback was given from those who had already visited to those planning to travel to Okonjima! AfriCat, attended the Agricultural College of West Anglia in Cambridge for their Open Day with the stand in June and attended the last of the Chris Packham talks programme – 'Tadpoles not included' with the AfriCat stand.

As an experiment AfriCat UK took part in the new 'Giving Tuesday' initiative with Adopt a Spot which was moderately successful and felt to be worth repeating in 2016.

Lion Guards appeal - AfriCat UK raised £2,000 from various events, donations and sponsorship to help fund the Lion Guards while longer term funding solutions were explored after the cooperate funding was unexpectedly cut.

AfriCat UK is very grateful to other individuals for their fundraising efforts for AfriCat including Paul Stephens who ran a Jazz evening in November for his 50th Birthday and is continuing his fundraising efforts, Simon Palmer who organised a number of talks on his photographs of Namibia and Maggie and Mike Talbot who gave a talk on their visit to Namibia to their local women's Church Group.

Regular contact was maintained with the electronic database with monthly newsletters.

The UK website has developed and is regularly maintained by Lisa Frost.

## Major Achievements

AfriCat UK runs an ongoing appeal to support existing Lion Guards working with AfriCat North. Regular contact with its database creates an increased network of support which helps to circulate AfriCat's message. Further, through this widening support base, more individuals are organising events to raise funding for AfriCat.

Tusk Trust celebrated its 25th anniversary in May 2015 with a dinner hosted by its patron, the Duke of Cambridge, at Windsor Castle. Donna Hanssen was honoured to attend on behalf of AfriCat, one of only two projects which Tusk undertakes to support in Namibia.

TUSK was one of AfriCat's earliest supporters, and provides finance for an array of the Foundation's projects. In 1999, it co-sponsored the first electrified perimeter fence, which kick-started the Cheetah Rehabilitation Project. TUSK was the first group outside of Okonjima that believed in the Foundation's vision that an 'orphaned' cheetah could learn how to hunt through trial and error, and with support and time, hone its skills to become independent.

Since 2012, TUSK has been the main sponsor of AfriCat's Environmental Education Programme. The programme is an enormous success, exposing young Namibians to some of the major environmental and conservation challenges facing their generation. The programme is set to expand to increase the number of learners who pass through its doors.

A new AfriCat UK website was created, updated and appropriately populated with Foundation news and information.

AfriCat UK was, once again, very fortunate to be working with Chris Packham on a number of projects to promote AfriCat.

AfriCat's conducted a presentation at the Royal Geographic Society in London, UK. BIG CATS - KEEPING THEM WILD - An evening with Chris Packham, conservationist, ecologist, presenter and wildlife photographer in aid of the AfriCat Foundation, Namibia.

AfriCat UK attended conservation exhibitions or tourism promotions – with the Namibian Tourist Board and tour operators to promote our conservation through education message and of course to sell quality products.





## Constraints & Challenges

While work has continued in maintaining and developing the electronic database the historic hard copy database needs time and work to make it more cost effective. Working to improve understanding and response times to key communications, options and activity may help to reduce frustrations and lost opportunities. The website needs regular attention to ensure it is kept fresh and up to-date. Social media is an increasingly important resource that needs management, time and options to move swiftly as events unfold that may work to AfriCat's advantage.

The lack of a major volunteering option at AfriCat in Namibia reduces the amount of people we can respond positively to and how much we can actively promote AfriCat.

The lack of a meaningful dues-paying membership base, as opposed to contacts list, restricts the amount of regular income that we can generate in the UK.

The impact of the overarching 'austerity measures' in the UK has reduced the levels of disposable income for the majority of the UK population. National data indicates that the levels of charitable donations across the board has fallen.

The national discussions around safeguarding data protection needed attention.

The challenges to predator conservation in Africa are large indeed, for as human populations continue to grow, the land left over for wildlife shrinks almost daily. Namibia is not immune to this phenomenon and the conflict between humans and wildlife requires continuous managing. Our sincere thanks go to TUSK for their invaluable support.

## Future Plans

To work in partnership with other organisations like the Namibian Tourist Board (NTB), Air Namibia, and tour operators to promote AfriCat and visits to Okonjima. This will be achieved with an AfriCat stand at suitable events such as Destinations (NTB), Bird Fair (WildFoot), Beyond with Steppes Travel RGS event in September, and with Chris Packham and his new lecture series from October.

AfriCat UK has acquired, through gifts, a number of original works of art which it plans to find suitable ways to sell. An evening is planned with British rowing Olympians. Other events are being explored and could include a concert in Sheffield, working with a wildlife park, talks to local groups, and developing ideas to support the fundraising needed for AfriCat North projects. A number of people intend to run marathons and 10K running and cycling events to raise funds for AfriCat.

“Giving Tuesday” in each November will also be supported to help to raise funds for Onguta School.

Discussions have started for an online sales option for AfriCat UK’s website to be operational soonest.

To start work on a meaningful membership option and ways to make effective use of the contacts databases.

To investigate scope for working more closely with zoos and wildlife parks to see if there was scope for funding through conservation initiatives.

Exploring, and developing, new fundraising options.

## AfriCat USA

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AfriCat USA is currently in the process of being legally registered in the US as a legal not-for-profit organisation. Once this registration has been achieved, full-scale awareness raising and fundraising activities will be established under various ‘chapters’ throughout the United States. AfriCat America registered in the state of Illinois with 5 new Directors on board.

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## AfriCat and Okonjima – A Symbiosis at Work

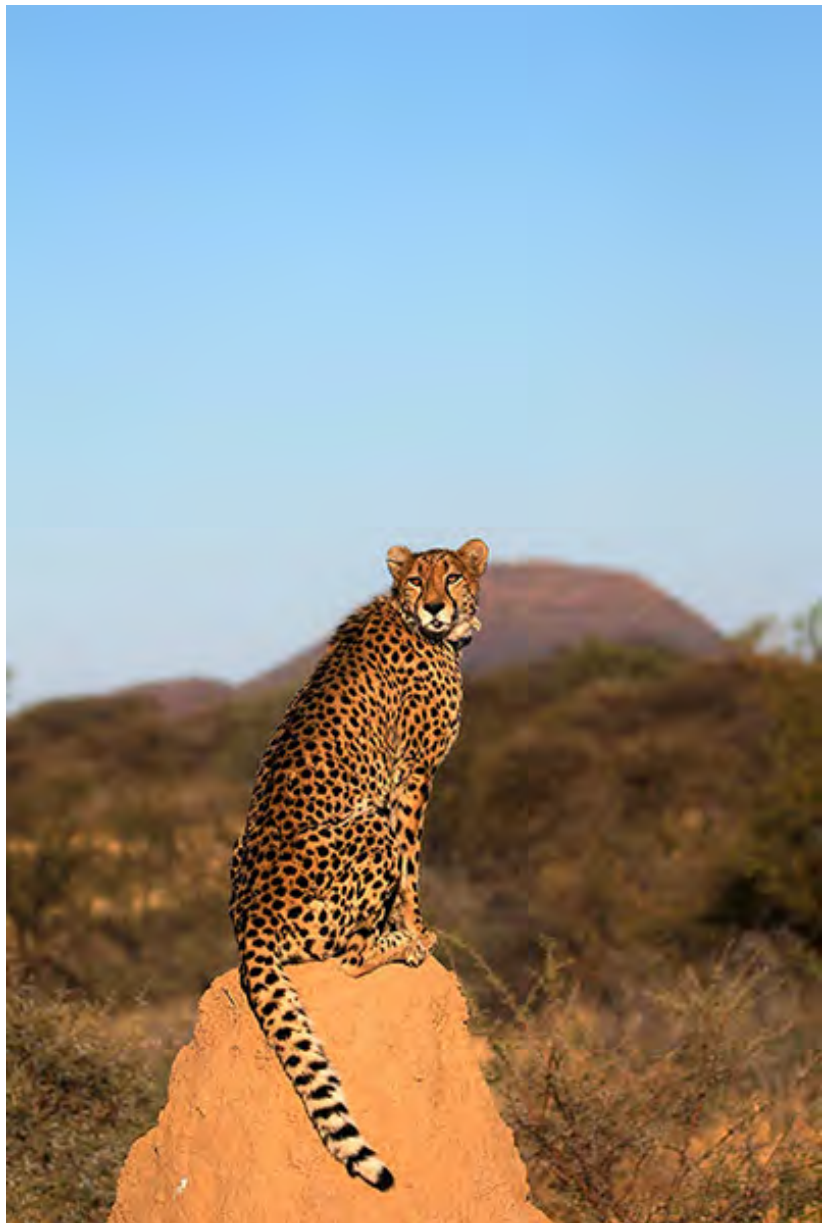
Okonjima, home of the AfriCat Foundation, was established as a small 'guest farm' in 1986. Okonjima, meaning "place of the baboon" in the Herero language, is an extensive tract of land nestled among the Omboroko Mountains, about seventy kilometres south of the small town of Otjiwarongo.

For the last 35 years, Okonjima has been in the hands of the Hanssen family. Today, nearly 20 years after Wayne, Donna and Rosalea Hanssen took over the cattle farm from their parents, the original farm has grown in size to 20,000 hectares and hosts a guest lodge business.

The cattle have gone, grasslands are returning, and wildlife abounds. Although they are separate entities, the relationship between Okonjima, its Nature Reserve, and the AfriCat Foundation is one of symbiosis.

In this, Okonjima owns and manages the land/nature reserve and operates the tourism business, while the AfriCat Foundation provides a unique opportunity for guests and sponsors to view large carnivores, as well as the work of the Foundation.

In turn, AfriCat receives an income from the revenue generated by tourism, which contributes to covering the running costs of the organisation as well as an opportunity to obtain additional income from visitors, having witnessed the Foundation's work with carnivores in Namibia first hand, through on-going sponsorship programmes.





## II. 2014 - 2016 Annual Report

### Programme 1: Research

#### Objectives

AfriCat undertakes and supports research on the carnivores of Namibia which will contribute to their long-term conservation. The direction of the Foundation's research programme is guided on the larger scale by the Government of Namibia's national policies and species plans while, at the local level, it focuses on issues which the AfriCat/Okonjima symbiotic relationship has identified as essential for the long-term sustainability of the Okonjima Reserve and the animals in it.

The major areas of research which AfriCat is currently focused on include:

- a) Human-wildlife conflict (causes and mitigation measures),
- b) Captive carnivore welfare, and
- c) Inter- and Intra-specific carnivore interactions within an enclosed nature reserve.





AfriCat's research programme is guided and coordinated by a Scientific Committee, formed in 2013.

Members of the committee include conservation experts, wildlife veterinarians, AfriCat full-time staff, and Foundation trustees.

Project proposals are approved by the Committee on a merit basis and their relevance to the Foundation's goals.

Research is carried out both by AfriCat staff members and visiting scientists.

The animals, facilities, and staff at AfriCat provide a fairly unique setting in which to undertake both basic and applied research on threatened and endangered wild carnivores in a natural setting, but with opportunities to also learn from captive and semi-captive animals.

## Key Issues

- 1) Indicators of optimal health of captive and free-ranging carnivores:
  - a) Dental health;
  - b) Parasite loads.
- 2) Human-Wildlife Conflict:
  - a) Establish lion population density in the Hobatere area of northern Namibia;
  - b) Develop approaches to resolve Human-Wildlife Conflicts through stakeholder participation.
- 3) Assess the population and conflicts of the African Wild Dog (*Lycaon pictus*) in the Greater Mangetti Complex of Namibia:
- 4) To develop an approach to promote conservation through tourism and education with specific emphasis on the complexities of carnivore conservation within a rangeland production area:
  - a) To understand the relationship between a range of predators and their prey in a semi-arid rangeland;
  - b) To understand how predators select and utilise available prey to ensure population growth;
  - c) To understand how predators interact during competition for food and habitat;
  - d) To improve our understanding of the requirements of the different prey species to sustain healthy populations in the presence of a wide variety of predators.
- 5) To assess the density and population size of leopards (*Panthera pardus*) in the Okonjima Nature Reserve using photographic capture-recapture sampling and provide scientific data on their demography as well as spatial and temporal distribution patterns.
  - a) To determine leopard density and population size via a capture-recapture framework using remote camera traps
  - b) To determine the demography of leopards within the Okonjima Nature Reserve
  - c) To develop a dataset that can be applied as a baseline for comparisons to similar areas
  - d) To develop a long - term population monitoring programme
- 6) Long-term study of sympatric carnivore interactions within an enclosed conservation area. Interactions between predators, both within and between species will be studied with the aid of telemetry and camera traps.

The study will assess the extent of intraguild predation and determine the size of home ranges and territories for individual animals within the reserve and how they relate to those of other predators.

In addition the study will provide valuable information on which to evaluate the success of carnivore rehabilitation on the reserve.





## **Project 1 - Programme 1: AfriCat Hobatere Lion Research Project (AHLRP)**

### **Objectives**

In order to manage Human Wildlife Conflict (the farmer-lion conflict) effectively and efficiently, it is crucial to have adequate and relevant information. AfriCat North is involved in programmes which will establish population density and activity patterns of lions living around human settlements in northern Namibia.

It is believed that the lion populations of the Etosha National Park and Kunene Region are FIV-free (Feline Immuno-deficiency Virus / Feline AIDs); one of the few FIV-free lion population in Africa. This FIV-free status makes the Etosha lion population an extremely important founder population source.

The Hobatere Concession Area lies adjacent to western Etosha National Park and is government-owned and managed by the Ministry of Environment & Tourism. Two Communal Conservancies share the potential to develop tourism ventures within this concession area. Between 1989 and 2011, the Hobatere Tourism Concession was privately



managed. The Concession was, however, terminated in May 2011 after a fire destroyed the main lodge building. No monitoring of the lion population has since been undertaken.

The objective of the Hobatere Lion Research Project is to conduct a study of the Lion (*Panthera leo*) population within the Hobatere Concession Area and the movements between the Hobatere Concession Area, western Etosha National Park, and adjacent communal farmland.

Specific objectives are:

- To understand the population dynamics of the lions utilising the Hobatere Concession Area, and how one or more of the prides found within Hobatere relate to the greater Kunene population and/or the western part of Etosha National Park;
- To understand the dispersal and or migration/immigration patterns of lions within Hobatere and the surrounding areas;
- To understand the role of:
  - water and prey availability within Hobatere and the surrounding areas;
  - fencing surrounding Hobatere and Etosha National Park; human pressure from outside of Hobatere;
  - hunting within the surrounding areas;
  - how these factors affect the movement of the so-called 'Hobatere lions' and the associated human-lion conflict within the area;
- To test the effectiveness of human-lion conflict mitigation measures, e.g. kraals, herding, geo-fencing/early warning systems, and translocations.





# Hobatere



Map: The Hobatere Concession Area & Surrounds, including water points. Courtesy of Ministry of Environment & Tourism, Etosha Ecological Institute, 2014)

The distance between the Hobatere Lodge and Campsite (renamed Etosha Roadside) waterholes is approximately 11.6 km, the distance between Lodge waterhole and Tree House is approx. 4.6 km, Tree House to Campsite 14.5 km. Animals frequenting the Campsite Waterhole also make use of waterholes within Etosha-west: (the distances after each water point indicate distance from the Campsite {Roadside} waterhole): Rhino Bomas (approx. 4 km), Kaross-Hoek (approx. 12.5 km), Kaross-Fontein (approx. 10 km), Otjovazandu-Fontein (approx. 7.6 km), Equinus (approx. 9 km), Renostervlei (approx. 27 km).

Work started in April 2013 due to extremely low rainfall during the 2012/2013 rainy season (September 2012 - April 2013), and the continued drought to date. The Campsite and Lodge water points, both within the study area, provide the only available water source, serving the entire 34,000-hectare area [see map below]. In order to establish the numbers and whereabouts of the 'Hobatere lions', AfriCat strategically positioned trail cameras and

established baiting-stations at the Campsite and Lodge water points: two trail cameras were placed at each water point and one each at a baiting-site close to the water points but not directly at the waterholes. The visual footage was downloaded every 2–3 days, collecting approximately 3,000 photographs from each site. Large numbers of herbivores were photographed, especially Mountain Zebra (*Equus zebra hartmannae*), Oryx (*Oryx gazella gazella*), Greater Kudu (*Tragelaphus strepsiceros*), Springbok (*Antidorcas marsupialis*), Black-faced Impala (*Aepyceros melampus petersi*), as well as various carnivores, including Spotted Hyeana (*Crocuta crocuta*), Brown Hyeana (*Hyeana brunnea*), Cheetah (*Acinonyx jubatus*), Leopard (*Panthera pardus*), and Lion (*Panthera leo*). Chacma Baboons (*Papio ursinus*) also frequented the water holes in large numbers.

After the initial weeks offered no lion sightings or reaction to calling stations, bait (antelope species and zebra bought from surrounding commercial farmers) was tied to a large, heavy tree trunk, positioned at the optimal darting range (25-30m). This method of attracting lions to a specific site in order to immobilise them was adopted due to the fact that the ‘Hobatere lions’ are extremely skittish as a result of continued and persistent persecution along the boundaries with commercial and communal farmland.



Between April–October 2013, the AfriCat research team plotted the road system and ‘dry’ water points in order to familiarise themselves with the area and terrain. Hobatere is situated adjacent to western Etosha National Park, comprising highlands ranging from 1,100–1,300m elevation, floodplains, and the ephemeral Kaross River system.



The following information was gathered April–October 2013, in the Hobatere Concession study area:

- Three young, adult males, VHF-collared with no transmission, one of which seems to be dominant and is often solitary or with one or two known females accompanied by 12-14 month old cubs. The males were collared by AfriCat on a commercial farm against the south-western Etosha National Park border in March 2012. They were returned to the Etosha National Park as part of a collaborative project with the Ministry of Environment & Tourism. The lions, however, returned to a permanent baiting station on the said farm. AfriCat successfully chased them off and they thereafter established new territory in Hobatere;
- One adult female + 5 cubs (estimated born Oct. 2012); seen regularly on trail cameras at Campsite waterhole, at times with one male and/or with a female with 2 cubs;
- One adult female (brand-marked by Dr. Stander at least 3-5 years ago) – last seen end 2012;
- One sub-adult male (often seen with the brand-marked female in iii above) – last seen end 2012;
- One adult female + 2 cubs (estimated born Dec 2012); has been seen with two males, possibly two of the three mentioned in i above; this lioness was collared using a GPS-Satellite collar on 27 October 2013, now known as 'Spots', in honour of the Dutch charity, Stitching SPOTS, who sponsored this collar;
- One adult female (collared as part of another as yet unknown project, collar too tight but lion in excellent condition, now known as 'Black-collared lioness'); was solitary until seen with 2 small cubs in July 2013. Since the birth of her cubs, she is in company with Spots, forming a tight-knit group of two females and 4 cubs. A solitary male is seen at irregular intervals with this small group of six.



**During Phase 2 (1 July 2014 – 30 June 2015, Permit # 1938/2014), and Phase 3 (1 July 2015 – 30 June 2016), this project:**

**1) aimed to re-establish accurate current data on the demography of lions within Hobatere and the surrounding areas:** Lion population size and demography were evaluated through live observations and photographs taken by trail cameras. The photographs taken by such cameras along with the information from the GPS-Satellite collars, showed that placing the cameras on roads and game trails only occasionally resulted in photographed lions. Even when lions were known to be in the areas close to the trail cameras they would not necessarily walk past the cameras. It was concluded that trail cameras placed at the three functional Hobatere waterholes (Roadside {prev. Campsite}, Lodge and Tree House (see Map Hobatere), three bait-sites (Roadside dam, Airfield site and Tree House) and one other road & game-trail site (Mine Road/Hunters Road Gorge, respectively), providing a reliable indication of the population in the area. Multiple trail cameras were placed at each waterhole, covering every angle from which lions could approach the water; a number of trail cameras were placed further away from the water but within 50 metres of the waterhole, providing effective coverage of lions passing by.

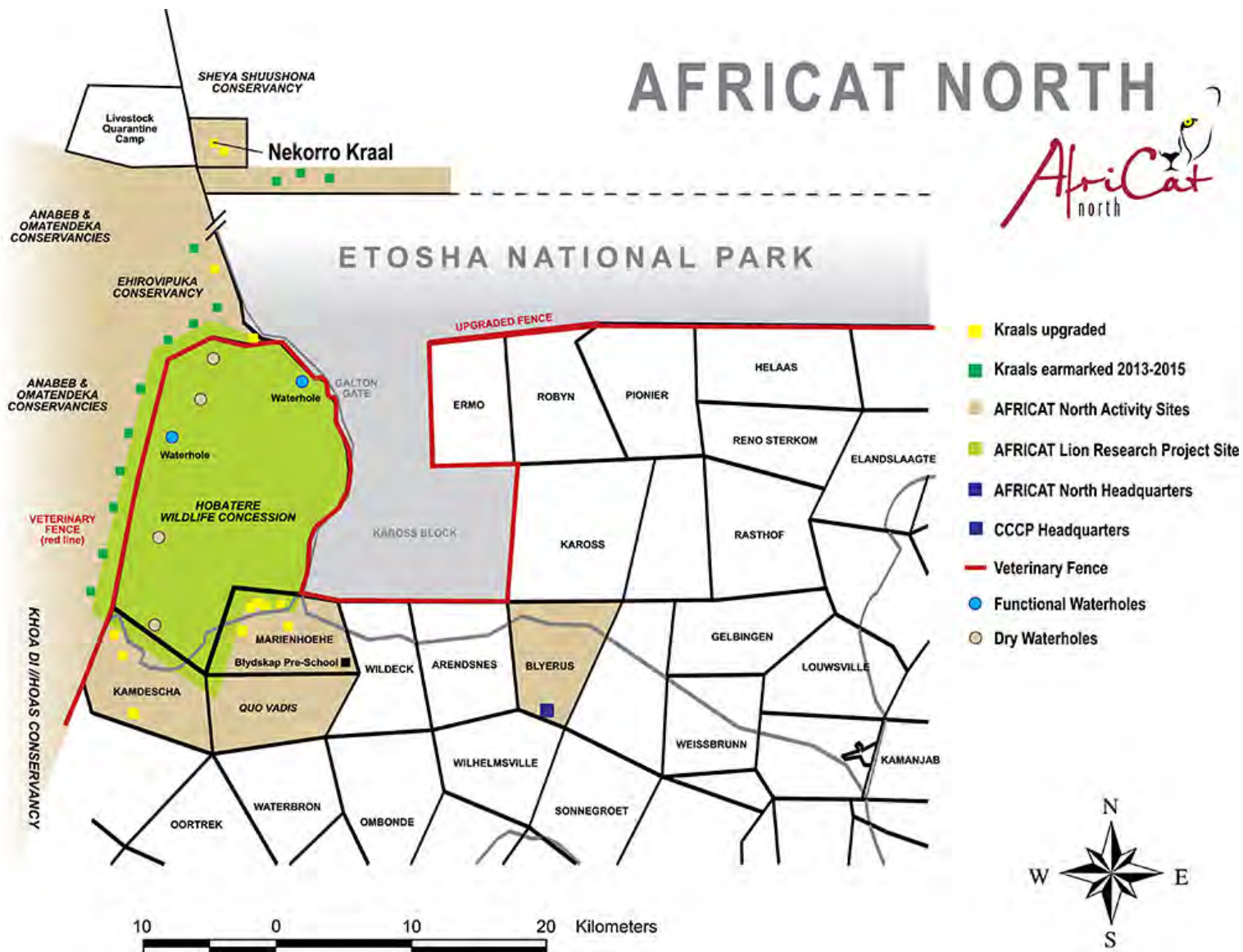
Observations from trail cameras compared favourably with live observation records. As far as could be established in year 2 (01 July 2014 - 30 June 2015), the following individuals were identified: 2 adult males, 4 adult females, 11 Sub-Adults + 5 cubs = 22 lions

**2) has provided initial data on the movement of lions into and out of Hobatere:** All collared lions were fitted with GPS-Satellite collars. These record the location of each lion every two hours and send that location via a satellite link to where we can access it almost immediately. The daily movements of the lions were recorded and described by linking the consecutive locations with straight lines, marking not the exact path taken by the lions but the shortest distance between known locations. The home ranges of the lions were described by plotting all the movement lines onto the same map.

From the home range maps it can be established which lions' ranges cover the Hobatere Concession, the distribution patterns, the frequency of cross-border movement into the Etosha National Park and onto adjacent farmland since collaring. Findings may be determined, thus: "She spends most of her time in close proximity to the Lodge Waterhole, the Tree House Waterhole or moving between the two; at no time did she spend more than 36 hours outside the Hobatere fence, along the western border. The remarkably straight lines between her den site and the Lodge Waterhole indicate her movements while she had small cubs in the den (October-December 2014)" and "Hpl-2 (Volkel) has a far larger home range. He spends most of his time near the Renostervlei waterhole and the Otjovasando Airfield in Western Etosha. Occasionally, he moves into the area between the Dolomite hills and the Western Etosha boundary, for several days at a time. He also occasionally visits the Hobatere area, especially the Lodge and Campsite waterholes and will travel through the Kaross block of the Etosha National Park. He has moved out of the protected areas of Hobatere and the Etosha National Park on two occasions: once onto the free-hold farm



Ermo (Map AfriCat North 2013-15; below), and once onto the communal farmland near Werda Veterinary Control Gate”.



**3) provided some of the driving forces which stimulate lions to move:** Scientists expect Namibia's climate to continue to become hotter and drier, with a projected temperature increase of 3.6-10.8° F (2-6° C) by the end of this century. Lower and more variable rainfall is projected. And even if rainfall decreases only slightly from today's levels, evaporation typically increases as temperatures rise, so Namibia is likely to become even drier. As water becomes scarcer, the range and number of wildlife supported by Etosha and other national parks could decline (Reid, H., L. Sahlén, J. MacGregor, and J. Stage. 2007. The economic impact of climate change in Namibia: How climate change will affect the contribution of Namibia's natural resources to its economy).

a) It was established that during the annual dry season (June-January), the man-made water points within the Hobatere Concession Area and in western Etosha clearly influence lion movement. Since the start of the AfriCat Hobatere Lion Research Project (AHLRP) in 2013, the study area has fallen within a below average rainfall region; it remains to be seen how movement may be affected once this region receives average to above-average rainfall;

c) the illegal presence of large numbers of livestock (cattle and donkeys/horses) within the Hobatere Concession Area habituate the lions to easy prey, often following these herds out of protected areas onto adjacent farmland, causing conflict.

**4) aimed to quantify both the degree of human-lion conflict and the impact it has on people living around Hobatere:** Farmer-Lion conflict along the borders of protected areas remains a challenge as Etosha NP and this protected area's fences are porous, allowing back and forth movement of wildlife as well as livestock. AfriCat's Livestock Protection Programmes offer support and guidance concerning livestock management, animal husbandry, and improved protection methods; AfriCat has built 16 nocturnal, livestock kraals on communal farmland along the western Etosha and Hobatere borders, reducing livestock losses when farmers abide by the concept of herding; if domestic stock are left to graze at night, the AfriCat Lion Guards have difficulty protecting said livestock from attack, and losses to lions and hyenas are inevitable. 2014-2015, reported livestock losses to lions totalled 24, with the loss of 10 lions. The continued drought has resulted in large numbers of livestock dying of hunger and thirst, coupled with increased losses to lions.





a) farmers in the lion-conflict zone or 'hot-spots' along the borders of Etosha and protected areas, reported the effectiveness of livestock kraals and the reduced loss of livestock;

b) the GPS-Satellite collar early-warning system effectively provided reliable information as to lion locations, but many farmers failed to heed the warnings and in some instances, the ineffective communication system (intermittent mobile phone reception), failed to convey the warning in time.

the proposed AfriCat Livestock Protection methods are effective if heeded by the farmers but the continued drought (year 3) has minimised the farmers' willingness to accept change and advice.

This map displays the Etosha National Park West region. Key features include:

- Boundaries:** A red line marks the 'Restricted Area' and 'Veterinary Control Fence'. A brown shaded area represents the park's extent.
- Landmarks:**
  - Waterholes:** Nomab Waterhole, Renostervlei Waterhole, Ojojasandu Airfield, Roadside Waterhole, Tree House Waterhole, and Etendeka Mountain Camp.
  - Camps:** Otjokovare, Werda Vet Control Gate, Kamesesha Vet Control Gate, and Etendeka Mountain Camp.
  - Other:** Dolomite Range, Free-Hold (Commercial) Farmland, Kamanjab, and various lodges like Palmwag and Grootberg.
- Roads:** Labeled with green markers and numbers: C43, C40, C38, C42, and C43.
- Rivers:** Otjokovare R., Ojojasandu R., and Kunene R.
- Infrastructure:** A red line indicates the 'Veterinary Control Fence' and 'Restricted Area'.

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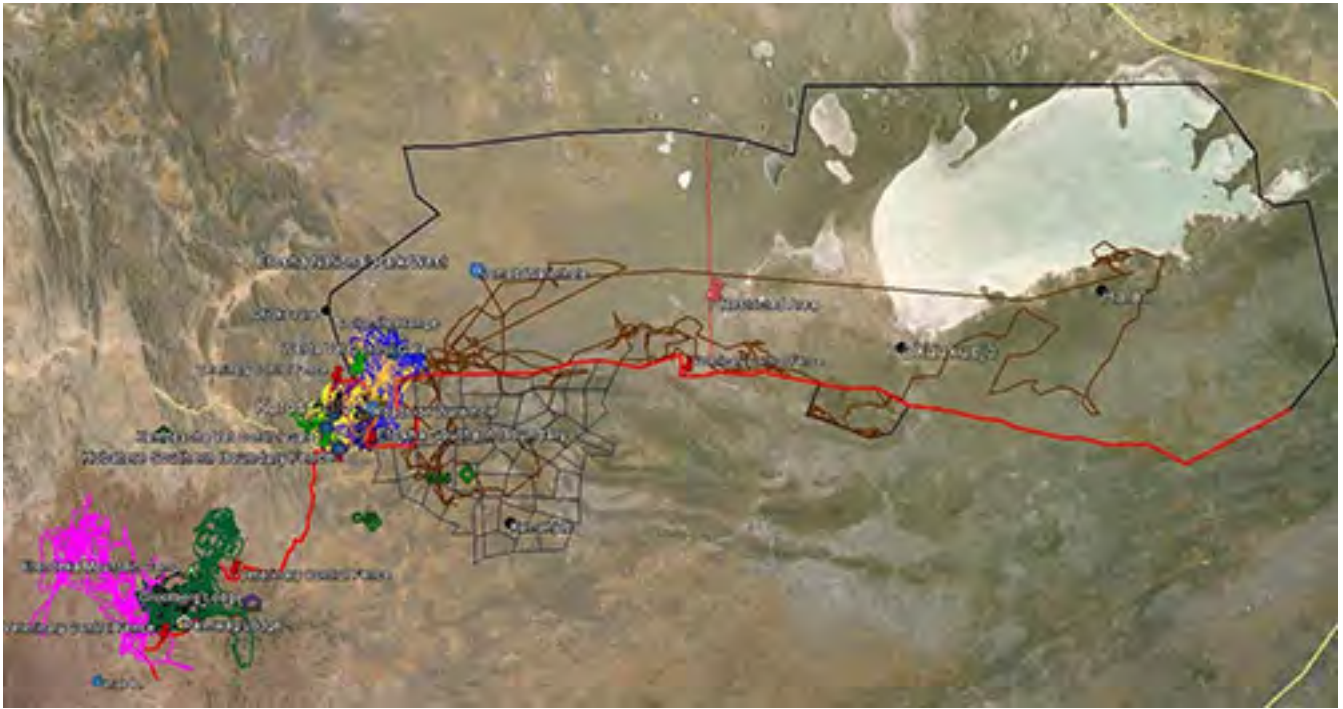
## Major Achievements

### Collared lions:

ID	NAME	GENDER	COLLARING LOCATION	DATE COLLARED	COLLAR ID / BRAND MARK
Hpl-1	Spots	F	Hobatere North	1. 23.09.2013	1. AWT 571
			1. Lodge waterhole	2. 22.09.2014	2. AWT 1334
			2. Airfield bait station	3. 29.01.2016	3. AWT 1804
			3 Airfield bait station		
Hpl-2	Volkel	M	1. Hobatere, Airfield bait station	1. 04.10.2014	1. AWT 1336
			2. Western ENP, Renostervlei waterhole	2. 03.05.2015	2. AWT 1651
Hpl-3	Gaob-Hampton	M	Etendeka, Omatendeka Conservancy	27.05.2015	AWT 1541
Hpl-4	Muna	F	Etendeka, Omatendeka Conservancy	28.05.2015	AWT 1540
Hpl-5	Tara	M	Etendeka, Omatendeka Conservancy	28.05.2015	AWT 1539
Hpl-6	Masialeti	M	Etosha Roadside (Hobatere Campsite)	07.06.2015	Telonics 677415A
Hpl-7	Liluli	F	Etosha Roadside (Hobatere Campsite)	08.06.2015	AWT 1335
Hpl-8	No collar	F	Farm Blyerus	17.08.2015	No collar
Hpl-9	Mansa	M	1. Farm Blyerus	1. 17.08.2015	Telonics 679046A
			2. Farm Ekongo-Kaross	2. 28.09.2015	
			3. Farm Robyn	3. 18.10.2015	
Hpl-10	Leo	M	Hobatere North, Tree House	15.12.2015	Telonics 679047A
Hpl-11	Meebelo	F	Hobatere North, Termite Plains bait station	22.02.2106	AWT 1885

### Collared Lions





### **Males:**

In March 2012, three young males were collared on a commercial livestock and hunting farm adjacent to south-western Etosha National Park border and returned to western Etosha, as part of a collaborative project with the Ministry of Environment & Tourism. Approximately 7 days after their relocation, the three lions returned to the well-visited baiting station on said farm via an elephant break in the Park fence, but were successfully chased off by the AfriCat Communal Carnivore Conservation (CCCP) team; these three males were regularly monitored and sighted at the Hobatere Campsite (now known as Etosha Roadside campsite), during May and October 2012.

Subsequently, two of the three males were fitted with GPS-Satellite collars (Hpl-2 – Volkel, 2014, and Hpl-6 – Masialeli, 2015); these males are most likely siblings, occasionally seen together or with the known lionesses.

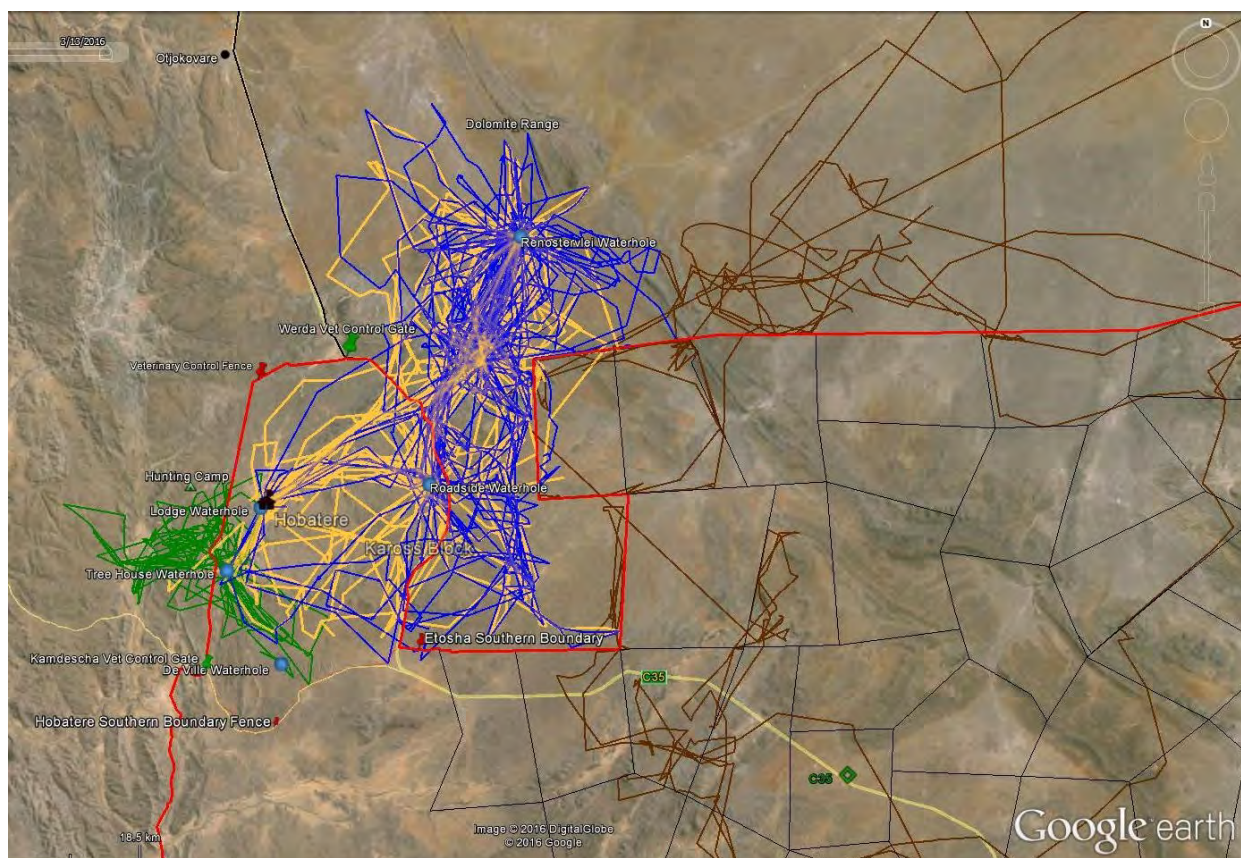
Hpl-9 was collared on free-hold farmland and relocated to Etosha three times, in the hope that he would join a group of females and remain within the protected area; on two occasions, he returned to farmland within a month, but seems to have settled down, mostly inside of Etosha's boundaries, after the third relocation (October 2015). Hpl-9 returned to western Etosha approx. 3.5 months later and intermittently moves onto free-hold farmland along Etosha's southern boundary; as far as can be ascertained, he has caused no livestock loss to date. We continue to monitor his movements on a daily basis and warn farmers in close proximity of his whereabouts. However, should he return to free-hold farmland, it is not within AfriCat's research permit regulations to relocate him once more and he could be declared a problem animal by the Ministry of Environment & Tourism and destroyed or shot as a trophy animal.





Hpl-10, together with his brother, was first seen in Hobatere end September 2015; the territorial males, Hpl-2 + Hpl-6 were not in the area at that time. These young males (estimated 4-5 yrs of age) were attracted by the Hobatere North pride sub-adult females in oestrus; these males have remained in close proximity to the Hobatere North Pride and mated with at least two of the sub-adult females as well as Hpl-1. Hpl-10 and his sibling brother spend a large amount of time outside of Hobatere on communal farmland, escaping the territorial males when they return.

Map: Etosha-Hobatere males distribution patterns





## Females:



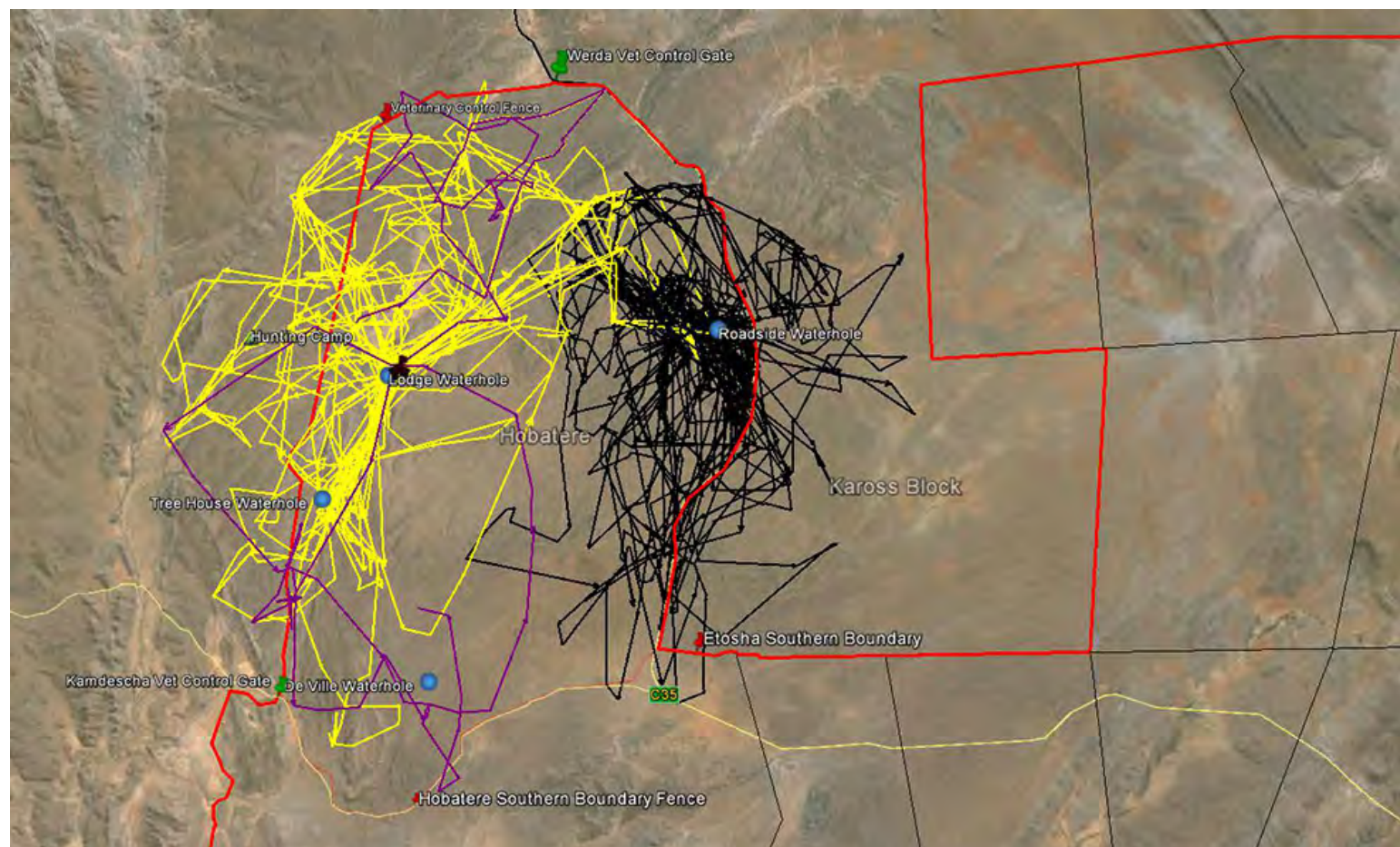
Two loosely-associated prides have been identified spending at least part of their time in the Hobatere Concession Area. Each pride is made up of two adult lionesses and their offspring. Neither pride has a resident male.

The Hobatere North Pride (SPOTS Pride) comprises nine lions: two adult lionesses, presumed to be mother and daughter, and their offspring. We were able to collar the older lioness, (presumed SPOTS' mother) on 22.02.2016 (named Hpl-11, Meebelo, she has a brand mark on her forelegs (T—I) from a previous research project). She has raised two female sub-adults (born approximately July or August 2013) to the time of writing. The other adult female (Hpl-1 – SPOTS), was first collared 2013 at Hobatere Lodge waterhole, with the collar replaced in 2014 + 2016. She has raised two female sub-adults (estimated born October-December 2012) and three younger cubs (born approx. 3 October 2014) to the time of writing. In 2014, she was seen with one male, possibly Hpl-6 (prior to his collaring), thus we suspect that her young cubs were fathered by him. The two lionesses and their offspring spend time together as a larger pride but are often separate.

Hpl-7 (Liluli), one of two adult lionesses of the Etosha Roadside Pride (previously Hobatere Campsite Pride), has raised two female and one male cub to the age of approx. 2 years at the time of writing; she is often seen in the presence of an older lioness (possibly her mother), bearing a brand-mark X1 (from another research project 2007); during December 2015, trail camera footage indicated that she was either in the final stages of pregnancy or lactating.



Map: Hobatere lionesses distribution patterns



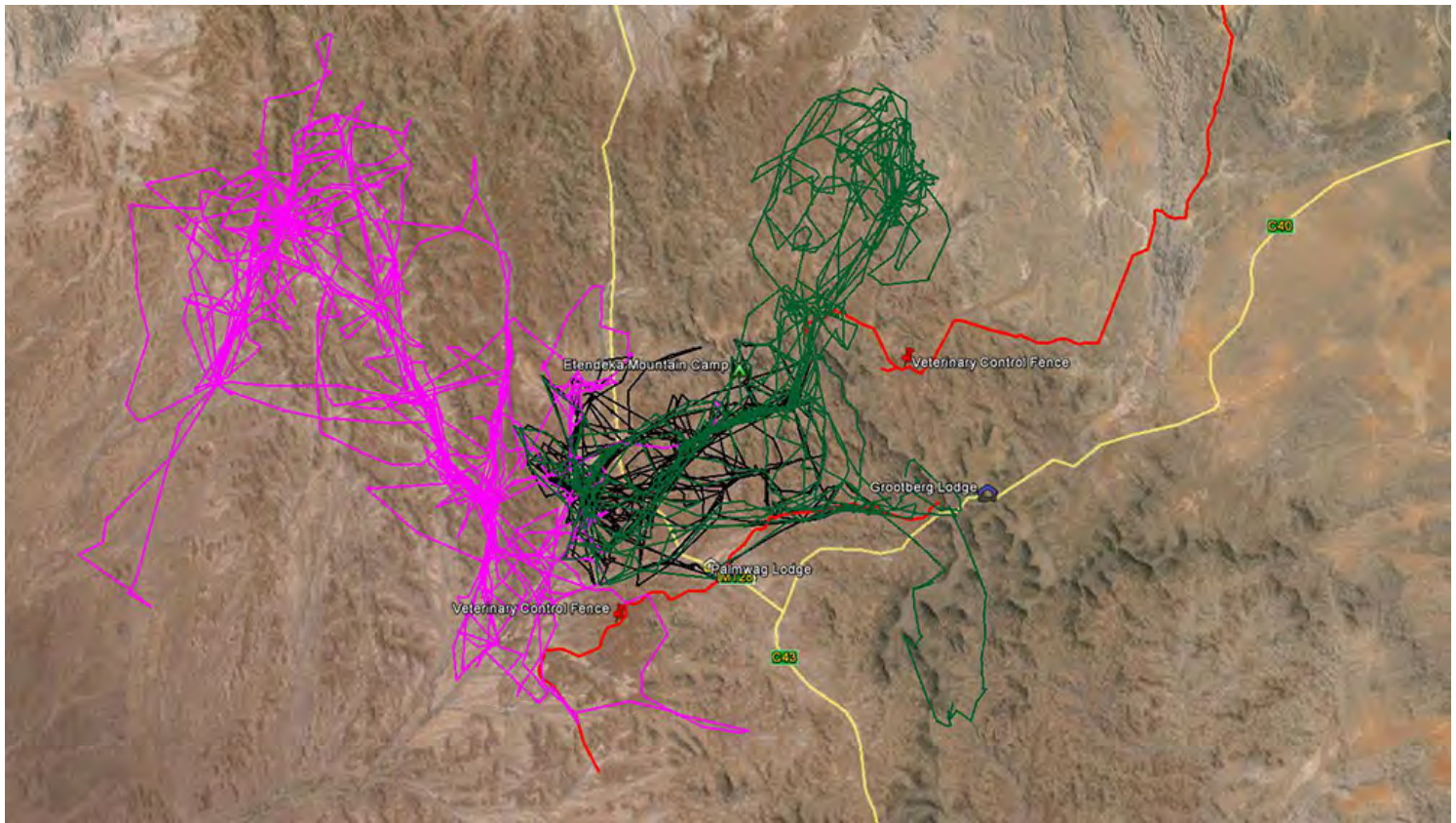
## The Etendeka Lions



Two males (Hpl-3 Gaob-Hampton + Hpl-5 Tara) and one female (Hpl- 4 Muna) were collared in May 2015, in the Etendeka Concession, Omatendeka Conservancy; this Conservancy lies



adjacent to the Ehrovipuka Conservancy (bordering Hobatere and western Etosha), where farmers experience conflict with lions, supposedly originating from Hobatere. These lions were collared in order to establish their movement patterns and home range, and to provide an early-warning system for the communal farmers of that area.



Map of Etendeka lion ranges

Hobatere Concession Area and Etosha-west: Distribution patterns and land use of 7 lions clearly indicate range cores within Hobatere and Etosha-west, with

- i) viable populations within the above-mentioned protected areas;
- ii) no evidence of viable populations within 10 -20 kms outside thereof;
- iii) cross-border movement is evident but temporary;
- iv) cross-border movement is influenced by livestock grazing within lion habitat and unprotected livestock alongside protected areas, despite AfriCat's Livestock Protection Programme with 20 kraals built for 'hot-spot' farming communities;
- v) porous protected area boundary fences encouraging back and forth movement of livestock and easy exit for lions.

Phase 2 & 3 of the AHLRP was supported by the Okorusu Community Trust, the Hampton School (UK), Stichting SPOTS (Netherlands), the Amersfoort Wildlife Trust (Netherlands), the ING 'Goede Doelenfonds voor medewerkers' (Netherlands), the Putman Group (Netherlands), 'Stichting Vrienden Beekse Bergen en Dierenrijk' (Netherlands), Gaia Zoo (Netherlands), Quagga Conservation (Netherlands), AfriCat UK, AfriCat America, and the AfriCat Foundation (Namibia), the FNB Foundation (Namibia), as well as donor individuals.

## Constraints and Challenges

The southern boundary of the Hobatere Concession is approx. 18-20 kms in length; large sections of this fence have been flattened by elephants seeking water on farmland, providing easy entry and exit for livestock and wildlife, including predators. The adjacent farming settlements are based 25m – 7 km away from this porous fence, offering easy prey to all predators, especially lion and spotted hyena. The AfriCat Livestock Protection Kraals have been built in these conflict zones, but, due to the extreme drought conditions only a few farmers make use of them, despite proof that livestock losses are reduced when animals are herded back home before nightfall. The AfriCat CCCP patrols find it exceptionally difficult to protect livestock from marauding lions when they graze unprotected in the field at night; the GPS-Satellite collars greatly assist with providing locations and early-warnings, but effective communications are hampered by the less-than-ideal mobile phone network.



Despite the recently renovated tourism facilities within the Concession, it may take a while for the benefits of such ventures to filter down to the farmers 'on the ground', who have lost livestock to lions; until such time as the lions' value to such communities has increased, AfriCat and concerned Concessionaires are faced with the challenge of keeping these valuable lions alive.

## Future Plans

Extension of Project into the Ombonde – Palmfontein area, Ehrovipuka Conservancy: since the successes of the AfriCat Lion Research Project and the Human-Wildlife Conflict Mitigation & Community Support Programmes have become evident, Conservancies further



afield have requested AfriCat's support and advice, including requesting monitoring of lions and spotted hyenas in their respective areas.

Extension of the project westwards (including Orupupa, Omatendeka, and Anabeb Conservancies) with the Grootberg Range as ecological boundary, has been discussed with Dr P. Stander of the Desert Lion Project.

The studies carried out since 2013 by the AfriCat Hobatere Lion Project (AHLRP) indicate strongly the natural movement of lions along the Otjovasandu and Ombonde Rivers, as well as where the rivers converge south-west of the Hobatere Concession Area; into the fourth year of drought, these ephemeral river systems offer the last source of grazing and browse for both livestock and wildlife.

Reports of at least 4-6 lions frequenting the Otjeombonde waterhole have been received, after the loss of 5 lions at the hands of a farmer illegally residing and farming in the Ehrovipuka Core area west of Palmfontein; evidence of lion movements entering the Hobatere Concession from the south-west has also been observed.

Funding is required for ten more collars and ten more trail cameras, which will enable AfriCat to establish lion numbers, age, and range, as well as identify problem areas regarding improved protection of livestock, increasing tolerance towards lions.

Mamma AfriCat – a new initiative introducing the ladies and mothers to 'Conservation Through Education', also encouraging creativity through locally made crafts.





## **Project 2- Programme 1: Namibia Wild Dog Project (NWDP) – A collaboration between Namibia Nature Foundation, N/a'an ku sê, and AfriCat**

### **Objectives**

Both national stakeholders and international African Wild Dog experts have identified the strong need to re-assess range, abundance/density, and conflict involvement of the species for the free-ranging stock. One of the main factors hindering effective African Wild Dog conservation remains the lack of information on their distribution and status. The objective of this project is therefore to assess the population and conflicts of the African Wild Dog (*Lycaon pictus*) in the Greater Mangetti Complex, Namibia.

The Namibian Ministry of Agriculture, Water, and Forestry has recently designated approximately 150,000 hectares of suitable African Wild Dog habitat in Tsumkwe District for small stock development, as well as another 150,000 hectares in eastern Kavango, adjacent to Khaudum National Park. This drastically increases the risk of human-Wild Dog conflict across much of the remaining African Wild Dog range. In 2009, livestock farming contributed approximately 3.2% to Namibia's gross domestic product. This figure represents why potential conflict species are usually not tolerated, as well as the need to develop techniques to protect livestock from predation. Unfortunately, there is no evidence that past outreach programmes have had any effect on farmer's attitudes towards conflict species and a better understanding is needed of African Wild Dog numbers and population



dynamics within the free-ranging population, in order to develop realistic and appropriate mitigation techniques. It is hoped that this additional research will act as a vital baseline study that can then further contribute towards developing a National Action Plan.

The Kavango Region, including the Mangetti Complex, represents an area of known African Wild Dog presence, with frequent visual sightings.<sup>2</sup> Although the Mangetti Complex is considered a high Human-Wildlife conflict zone, it also the only area within Namibia that constitutes a viable natural dispersal area for Wild Dog, and is recognised as a potential (historical) corridor between eastern African Wild Dog populations and Etosha National Park. During the International Wild Dog Workshop 2011, the Ministry of Environment and Tourism (MET) identified the Mangetti Complex as an area of low-level sampling (an area in need of more research and monitoring) with regard to African Wild Dog research and a priority in terms of its conservation in Namibia.

Specific objectives are therefore:

- Help establish reliable figures on the free ranging African Wild Dog population in Namibia;
- Document the perceived and actual degree of human–Wild Dog conflict in the Mangetti Complex;
- Develop a robust method of disease management (Mangetti Ranch);
- Contribute towards developing a National Action Plan.



## Main Activities

Continuing of wild dog/farmer conflict assessment

Completion of domestic dog abundance assessment – planning for vaccination and sterilisation campaign

Ongoing population structure and reproductive assessment for Wild Dogs

## Ongoing prey population assessment

An aerial game census was carried out in August, the results of which recorded diminished game numbers from preceding counts.

Additional remote camera traps were positioned at identified African Wild Dog activity locations e.g. previous dens, anecdotal observations, water holes, and wildlife or livestock kill sites, as well as any other suitable locations in order to document presence/absence as well as group structures thanks to the generous donation of Reconyx trail cameras from BMZ (The German Development Cooperation & The German Federal Ministry for Economic Cooperation & Development). The German Ambassador to Namibia and Mr. Huekmann of BMZ handed over the donation of 10 motion detection cameras for the Namibia Wild Dog Project at AfriCat HQ in the Okonjima Nature Reserve.

## Major Achievements

### Aerial Game Census

This census took place in July 2015, and was conducted by Stuart Munroe and Dr. Rudie van Vuuren. A full report was submitted to MET in September 2015. A total of 63 target wildlife detections were GPS-logged during this survey. All observations recorded occurred within the delineated study area.

Species	No. of Detections	Total No. Counted	Min. Group Size	Max. Group Size	% of Observations	% of Animals Counted
Common duiker ( <i>Sylvicapra grimmia</i> )	20	21	1	2	31.7	17.5
Eland ( <i>Taurotragus oryx</i> )	1	7	7	7	1.6	5.8
African elephant ( <i>Loxodonta 3fricana</i> )	1	16	16	16	1.6	13.3
Greater kudu ( <i>Tragelaphus strepsiceros</i> )	12	27	1	7	19	22.5
Porcupine ( <i>Hystrix cristata</i> )	1	1	1	1	1.6	0.8
Secretary bird ( <i>Sagittarius serpentarius</i> )	1	1	1	1	1.6	0.8
Steenbok ( <i>Raphicerus campestris</i> )	12	15	1	3	19	12.5
White-backed vulture ( <i>Gyps africanus</i> )	1	1	1	1	1.6	0.8
Warthog ( <i>Phacochoerus africanus</i> )	14	31	1	6	22	25.8



Common duiker, warthog, steenbok and Greater kudu contributed to the majority of all observations. A single observation of eland was made. Neither giraffe nor African wild dog were recorded.

One observation of African elephant (*Loxodonta Africana*) was recorded consisting of a herd of 16 individuals, two of which were juveniles.

This survey showed a marked reduction in both wildlife detections and consequently wildlife numbers observed and recorded compared with previous censuses. The low numbers of prey species places pressure on the wild dogs to find alternative food items which is likely to be livestock increasing the potential for conflict in the area.



## Human-Wild Dog Conflict

Data kindly received from Mr. Hansman du Toit of the KCR management staff detailed the total numbers of livestock losses from April 2014 to April 2015.

Of the 859 recorded losses, 208 (24%) were suspected to be directly attributable to depredation from wild dogs. Leopard and other predators accounted for 51 (6%), other losses (disease) accounted for 193 (22%) and the remaining 407 (47%) were recorded as missing with no cause known.

Thankfully no direct persecution of African Wild Dog was reported or recorded during 2015 on the KCR.

However, despite not being photographed on any trail cameras, 2 packs of dogs were reported to be active in the national park to the east. In late September 2015 one pack, denning in the north-west of the park, was suspected of livestock depredation on surrounding livestock farmland; subsequently several dogs were shot in retaliation by local farmers. By mid-November the pack was reduced to a single adult male and 5 puppies. These animals subsequently left the park through the southern boundary where, despite attempts to track them on foot, all sign of them was lost.

The capture and fitting of GPS satellite tracking collars to resident pack members will allow intensive and detailed modelling of Wild Dog movements in the Mangetti area. It will also help in conflict mitigation procedures by allowing the advance warning of wild dog movements onto adjacent commercial livestock farmlands, allowing for better livestock protection measures to be implemented before severe depredation occurs. This will form part of the outreach to increase knowledge sharing amongst concerned landowners and help reduce persecution to this endangered species in the area.

The N/a'an ku sê Foundation recently met with Piet Beytell from MET and 1 x AWT collar with another 4 Telonics collar (supplied by the N/a'an ku sê Foundation) will be deployed. It is planned to use some of the captive dogs currently housed at N/a'an ku sê Foundation to lure the dogs in the area to be able to immobilise and collar them, this experiment will be documented as it will be a first for immobilising wild dogs.

Continued aerial game censuses will enable the documentation of natural prey species population densities and distribution and determine whether these populations remain stable, increase or decrease. If these populations of prey species continue to decrease this will place extreme pressure on the wild dog populations, forcing them to either migrate out of the area or turn to livestock as a secure food source which will only increase conflict and thus persecution in the area.

## **Observations & Records**

Trail Camera Monitoring Cameras were visited to replenish batteries and memory cards on 5 occasions during 2015. Those cameras which were sited at previously active den sites recorded zero Wild Dog activity – it is suspected that disturbance at the dens, especially the mortality recorded in August 2014 where a spring-loaded foot-trap was placed at one of the active den entrances, may be the cause. One adult female dog was caught in the trap and subsequently died. The details of the incident, including photographs captured of the individuals during the trap placement were handed over to the relevant management staff of the Namibia Development Corporation for disciplinary action and as evidence for any prosecution.

### **Present Group Structures:**

Group A: 4 adults, 3 sub-adults, 9 pups

Group B: 5 adults, minimum of 5 pups

Group C: 13 adults, 3 sub-adults and unknown number of pups

Groups D: 3 adults + 1 sub-adult

There appears to be a fifth (unconfirmed) group in the area. Group D has not been observed for the last three months, but this could mean they are denning in the communal areas.



African Wild Dog mortalities have been caused by indiscriminate persecution, disease (rabies) and road accidents. Local prey species recorded include wildebeest, kudu, springbok, impala, hartebeest, oryx, eland, steenbok, duiker, warthog, cattle and goats.

Scat (faecal) analysis of 369 samples showed cattle remains in 23% of samples. Dogs have the highest impact on livestock farming during denning seasons when their hunting activities become localised and concentrated around the den. Livestock depredation locally is a function of reduced natural prey densities resulting from extensive poaching of ungulates.



Consultations have recently been held with 17 commercial free-hold farmers, one communal authority, one government protection authority and one parastatal development agency regarding human/wildlife conflict. Attitudes towards Wild Dogs differ by land ownership and according to majority opinions of interviewees, the government protection authority is tolerant, while the parastatal agency is semi-tolerant. Commercial and communal farmers are intolerant and actively persecute the dogs.

The impact area of the Namibian Wild Dog Project is now approximately 7,000 km<sup>2</sup>. The project has recorded 117 confirmed Wild Dog observations since late 2012 and use of the cameras has allowed a first baseline population assessment that will be useful for monitoring population trends into the future. The first results of the project have recently been presented to a public audience at Namibia's Scientific Society and are also shared with the Ministry of Environment and Tourism as well as relevant land owners and communal farmers in the Mangetti Area.

There were no recorded Wild Dog mortalities or disturbance of dens on the KCR during 2015, however several dogs denning in the MNP were shot on adjacent livestock farmland.

### **Constraints and Challenges**

The most important conclusion to come out of the past years of monitoring is the absolute need for a more permanent researcher to be stationed in the Mangetti area to be able to more closely research and monitor the movements and activities of the resident populations of African Wild Dog. This will also allow for more rapid response to conflict situations and outreach work to begin examination and implementation of conflict mitigation measures on surrounding commercial farmland areas.

Many more motion-sensitive trail cameras are required for deployment on the KCR and surrounding commercial farmlands for increased coverage in the monitoring of the movements of the various resident Wild Dog packs.

### **Future Plans**

The NAWDP project plans to have a more permanent research staff member in situ during the first quarter of 2016.

The next phase of the project will be to fit a GPS-Satellite collar onto one Wild Dog in each pack. This will allow us to monitor conflict and movements, how far they travel and what territories each pack occupies.

Intensive fundraising efforts are continued to secure the purchase of remote cameras for this study.





## Project 3 - Programme 1: Research in the 20,000 hectare (200 km<sup>2</sup>) Okonjima Nature Reserve

### Objectives

To develop an approach to promote conservation using tourism and education as catalysts, with specific emphasis on the complexities of carnivore conservation within a rangeland production area.

The immediate mission is to turn the 20,000 hectare Okonjima Nature Reserve, which was recently denuded farmland, back to its natural state last seen, perhaps, 200 years ago. The approaches engaged in this regard must be sustainable and a benefit to local communities for it to survive the tides of social and environmental change in Namibia. Researching herbivores and carnivores within the Okonjima Nature Reserve, particularly cheetahs, leopards, and brown hyenas, will help future farming communities and, ultimately, reduce the numbers of predators killed on farmland. The objective of AfriCat's research in the 20,000 hectare Okonjima Nature Reserve is to develop practical solutions to the farmer-carnivore conflict and contribute to the understanding of herbivore-carnivore interaction for the benefit of animal conservation.

The sub-objectives are:

- a) To understand the relationship between a range of predators and their prey in a semi-arid rangeland;
- b) To understand how predators select and utilise available prey to ensure population growth;
- c) To understand how predators interact during competition for food and habitat;
- d) To improve understanding of the requirements of the different prey species to sustain healthy populations in the presence of a wide variety of predators.



AfriCat is currently implementing four studies in the 20,000 hectare Okonjima Nature Reserve:

**Predator–prey interactions:** This study aims to establish how private, tourism-based game parks in Namibia can play a role in the long-term conservation of carnivores. The study will develop a model for the variety of prey animals which can be sustainably supported by this variable environment. The model will be tested against the information available and new information gained from research (data gathered through radio collars and observations, direct management action, land recovery management, focusing on the species in their natural habitat).

This model will be used to predict the predator population which can be supported by the available prey base. This prediction will be tested using radio-collared predators to indicate habitat preferences and their overlap with prey species. Predator population responses will be monitored by direct observations of predators in their natural habitat. These models will then be used to inform other conservations of the appropriate predator-prey numbers in these environments and will be evaluated against the outcomes on a regular basis.



### **Predator density study**

The study is aiming to assess the density and population size of leopards (*Panthera pardus*) in the Okonjima Nature Reserve by using photographic capture-recapture sampling and to provide scientific data on their demography as well as spatial and temporal distribution patterns. A dataset will be generated that can be applied as a baseline for comparisons to



similar area. After completion of the core study a long-term monitoring program will be implemented based on the application of remotely triggered wildlife cameras ensuring a minimal invasive monitoring of the leopard population in the Okonjima Nature Reserve in space and time.

### **Rehabilitation of degraded areas:**

This long-term study will investigate different methods of rehabilitating degraded areas. Standard evaluation techniques such as the Landscape Function Assessment (Ludwig et al. 2004) will be used to determine the success of different approaches.

### **Herbivore (prey) population monitoring project:**

In order to be able to support a prey sustainable population in the presence of predators it is essential to understand the resources available to the different prey species and to understand their habitat preferences for foraging and resting. Further, in order to be able to sustain these aims, the following aspects will be addressed by AfriCat or through directed research projects:

- a) Classify the vegetation and habitats in the study area to be able to map the resource areas for the different herbivores according to their requirements;
- b) Establish how the different prey species utilise these habitats in the different seasons and under different rainfall conditions;
- c) Determine the number of animals which can be supported by the environment on a yearly basis and recommend management actions accordingly;
- d) Determine the increase in available resources through rehabilitation projects;
- e) Sustainable use of wildlife: Information gained from the above studies will help determine the number of animals which can be utilised for other purposes such as supply of game meat to tourists without compromising the prey species or their predators.

### **Major Achievements**

- The purchase of 22 remotely triggered wildlife camera traps model Cuddeback Triple Flash, model C123, enabled the implementation of the Okonjima leopard density study with the proposed project title: The assessment of leopard (*Panthera pardus*) density and population size via a capture – recapture framework in an island bound conservation area in Namibia.
- Successful opening of 400 hectares of new plains since 2014 by removing invasive bush, as part of a 7,000 hectare project to reintroduce springbok, which were once endemic in this area.
- Changes in perimeter fence-line were made; the southern fence line extended and is now including the mountain range.

- Introduction of 100 springbok into the Okonjima Nature Reserve as more suitable prey species for rehabilitated carnivores.
- Drill of eight boreholes, of which two were successful, as part of a programme to better distribute game throughout the reserve.
- Deepening of two dams to hold more water during the dry season.
- Control of the re-growth on open plains by cutting and selective poisoning.
- Collaring of 9 leopards between 2014 and 2016 for the predator/prey population study (resulting in a total of 15 collared individuals).
- Collaring of three brown hyenas (*Hyaena brunnea*) since 2014 for the predator/prey population study resulting in a total of four collared individuals.



## Constraints and Challenges

- Finding and/or developing a way to de-bush denuded farmland which will not cause erosion or the invasion of other weed and bush species.
- Finding a practical solution to help maintain incumbent grasslands in a natural way, i.e. controlled burning programme.
- Develop better methods to radio-track, monitor, and research animals without having to immobilise them every 2 years for radio collar adjustments and battery replacements.



## Future Plans

- To relieve from bush encroachment and open up 1/3 of the 20,000 hectare Okonjima Nature Reserve. Opening 1/3 into mixed woodland and leaving 1/3 bushveld thickets – thus, with 500 hectares of de-bushing completed, the remaining target is circa 6,500 hectares.
- Building more water points, i.e. building dams and installing solar pumps.
- Continuing of the construction and maintenance of roads in such a way that will minimise erosion and maximise the utilisation of the reserve.
- Combating erosion in all denuded areas of the Okonjima Nature Reserve, therefore reversing land degradation and erosion which has occurred over the past 50 years.







## Project 4 - Programme 1: Research in the AfriCat Carnivore Care Centre

### Objectives

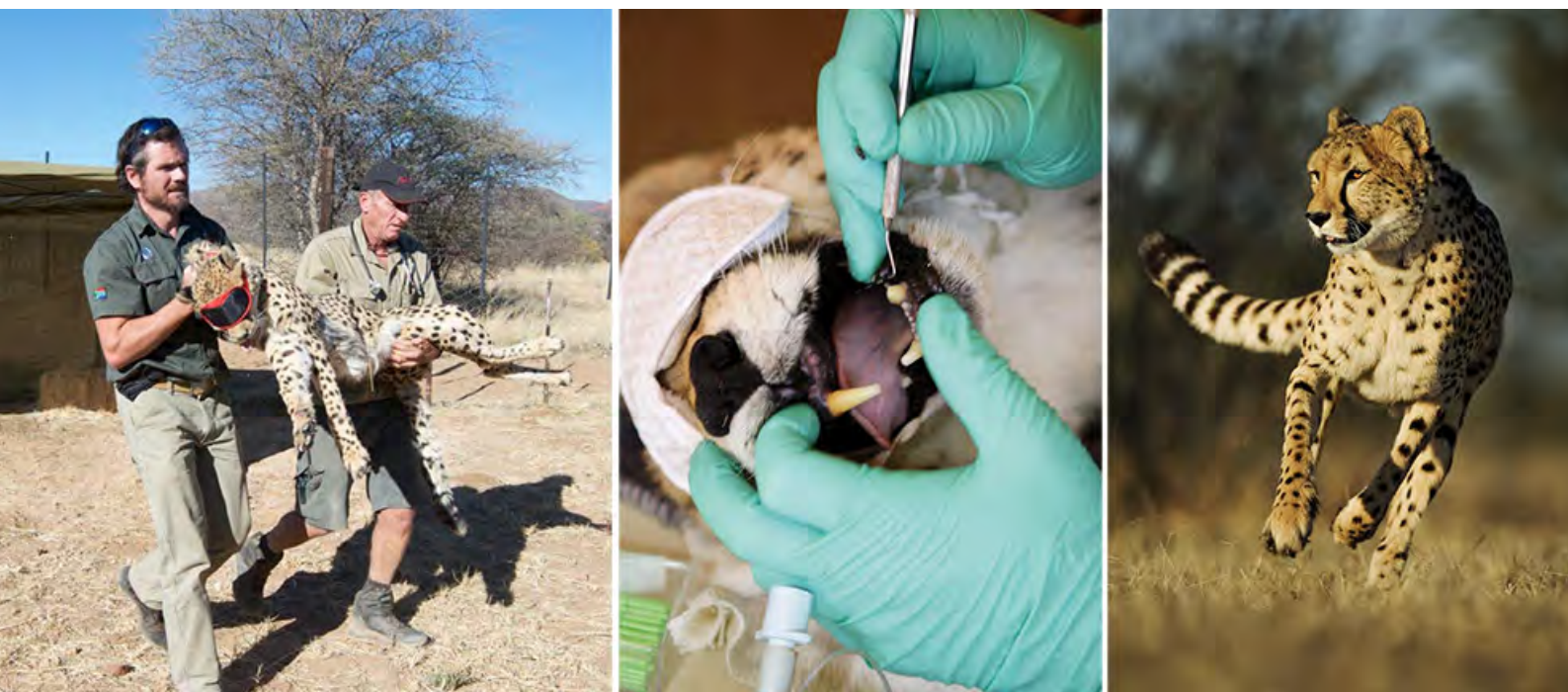
The animals, facilities, and staff at AfriCat provide a fairly unique setting in which to undertake both basic and applied research on threatened and endangered wild carnivores in a captive, semi-captive, and a free-ranging environment. Optimal health is central to both animal welfare and conservation and is therefore a key focus of research.

In captivity, cheetahs are known to frequently suffer from a number of unusual diseases not typically seen in other large captive felids. These include glomerulosclerosis, renal amyloidosis, oxalate nephrosis, lympho-plasmacytic gastritis, veno-occlusive disease, splenic myelolipomas, cardiac fibrosis, and adrenal cortical hyperplasia with lymphocytic depletion of the spleen, as well as several ill-defined neurological diseases. Dental and oral diseases have also been seen frequently in this species and the relevance thereof, as well as the influence they may have on several of the previously mentioned conditions, is still unclear. Some of these chronic degenerative diseases eventually affect the majority of cheetahs in captivity and are considered to be the primary cause of morbidity and mortality in adult animals.



In contrast, the incidence of similar histological lesions in free-ranging cheetahs was found to be very low. Stress, lack of exercise, low genetic variability, and the provision of unnatural diets in captive facilities have been proposed as potential causal factors, but to-date convincing pathophysiological explanations for these diseases have been lacking or unsatisfactory.

Chronic diseases are often difficult to investigate due to the time span over which they develop and the complex biological interactions in living organisms that confound simplistic explanations. AfriCat has therefore proposed a three-pronged approach to clarifying the mechanisms of these idiopathic diseases in captive cheetahs.



Firstly, AfriCat plans to compare the metabolic profiles of captive cheetahs to those of their free-ranging counterparts. This is expected to highlight abnormal serum and urine metabolite concentrations in the captive animals, thus generating new hypotheses for further investigation. Secondly, AfriCat hopes to intensively study the health of the AfriCat cheetahs over a number of years to determine immune system function as well as disease progression and prevalence. Thirdly, AfriCat shall monitor the dental and oral health of these individuals over a period of time, which may assist in identifying underlying processes at play.

The aim of the study is therefore to establish baseline health data using a broad range of technologies and then to collect annual health status information at the time of AfriCat's annual health checks in June/July each year. It is expected that this research will dramatically benefit the large felids in captive, rehabilitation, and welfare facilities, around the world.

## Main Activities

The completion of the modern AfriCat clinic in June 2013 provided an excellent veterinary facility and working environment for the annual health checks in 2014 and 2015.

The annual AfriCat health examinations were performed from 30 June to 10 July 2014 and from 29 June to 9 July 2015.

During both health examinations, baseline data and samples were collected from all the cheetahs, lions and leopards at AfriCat's Carnivore Care Centre for our registered project (the long-term health monitoring and immuno-competence of captive cheetahs (*Acinonyx jubatus*) and other felids at AfriCat in Namibia) and the dental and oral health of all the animals evaluated. All the animals were weighed and vaccinated against feline calici virus, feline panleucopaenia virus, feline herpes virus, feline rhinotracheitis and rabies. All animals received an injectable endoparasitic medication and were treated against external parasites and flies.

### **Health examinations 2014:**

A team of specialists, mostly from the University of Pretoria (UP), joined the AfriCat team to surgically sterilise all female cheetahs and leopards that are considered unsuitable for release into the wild.

The Namibian government passed legislation requiring the irreversible sterilisation of all female captive large felids in a bid to prevent the captive breeding and illegal trade of these species.

Dr. Marthinus Hartman, one of the surgeons at UP, had developed a minimally-invasive laparoscopic technique to sterilise captive lions in South Africa. With the specialised equipment provided by the German company, Karl Storz, the cheetahs and leopards could have their ovaries removed or fallopian tubes tied off in the same way, through a single surgical incision. This means less trauma and pain and a far lower risk of any post-operative complications. As with any new technique, all aspects of the procedure would have to be accurately documented so that the method could be published in an international veterinary journal.

Dr. Hartman was accompanied by his Ph.D. supervisors – Prof. Eric Monnet from Colorado State University and Profs. Johan Schoeman and Robert Kirberger from UP as well as a reproductive specialist Prof. Martin Schulman and anaesthesiologist Prof. Frik Stegmann. A total of 11 cheetahs and 2 leopards were sterilised successfully using this laparoscopic technique.



This year gastric biopsies were collected for the first time from captive cheetahs with a flexible endoscope, a camera with which to visualise the inside of the oesophagus and stomach. Cheetahs in captivity frequently suffer from gastritis, an inflammatory condition of the stomach lining, often associated with the bacteria *Helicobacter*. Small biopsies of the stomach lining were collected for further examination. The underlying cause of gastritis in captive cheetahs is unknown. It is our hope that this work at AfriCat will provide some answers.

A microbiome study was initiated by Dr. Adrian Tordiffe, Dr. Steenkamp (both UP) and Dr. Holly Ganz from the University of California. The aim of the cheetah microbiome project is to genetically characterise the gastrointestinal bacteria of the cheetah using high throughput next-generation genome sequencing. The type of bacteria and their relative abundance will be compared between captive and free-ranging cheetahs and between healthy cheetahs and those with gastritis. Once a "normal" bacterial profile has been established, we will also be able to see how this changes in response to dietary manipulation.

Dr. Emma Sant Cassia from the Royal Veterinary College in London conducted a study on the potential use of a non-invasive high definition oscillometric blood pressure monitor in cheetahs. Cheetahs develop very high blood pressures (hypertension) during anaesthesia, mainly due as a side effect of the drug combinations that are commonly used, but we also suspect that some individuals also suffer from chronic hypertension even when they are not anaesthetised.

## **Health examination 2015**

Dr. Martinus Hartman & part of his team came back to take laparoscopic uterine biopsies of all the cheetah females that underwent salpingectomy during the 2014 health examinations and also examined their reproductive tracts by ultrasound with the help of Dr Robert Kirberger. The purpose of this year's exercise was to detect any negative effects of the surgical procedure on the uterine health long term - to make sure we determine the safest and best method of permanent sterilisation in carnivores.

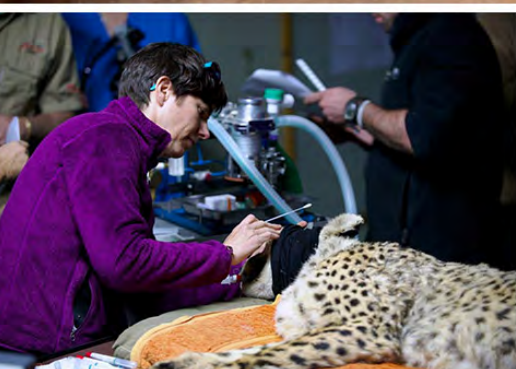
Abdominal ultrasounds were performed by Prof. Robert Kirberger on all the carnivores at AfriCat undergoing health checks to evaluate general disease problems and the organs that are commonly affected by disease in cheetahs such as the liver, kidneys and stomach. The size of adrenal glands were determined as an indicator of chronic stress.

Continuation of gastric biopsy collection of captive and free-ranging carnivores.

Continuation of microbiome and blood pressure study which were both initiated in 2014. In-depth ophthalmology examination were carried out this year by Dr. Christie Boucher from the Faculty of Veterinary Science at the University of Pretoria.



Two attending anaesthesiologist from the Faculty of Veterinary Science at the University of Pretoria initiated an anaesthesia study to document anaesthetic maintenance and anaesthetic related deaths in cheetah.





## Major Achievements

Every captive large cat at the AfriCat Foundation was thoroughly examined and samples were collected from them for extensive analysis during the 2014 and 2015 annual health checks. This work will form a sound baseline for future research.

The samples and data collected will make up the bulk of the materials for Dr. Adrian Tordiffe's Ph.D. project entitled "Metabolic profiling of southern African cheetahs (*Acinonyx jubatus*)".

The samples will also be used for a comparative study of serum and urine electrolyte and renal physiological parameters between captive and free-ranging cheetahs, conducted by Dr. Gavin Hudson-Lamb from the University of Pretoria (South Africa).



Dr. Gerhard Steenkamp has been undertaking Ph.D. work on dental and oral health in cheetahs, and hence data collected related to this will be integrated in his dissertation.

Seven research papers have been published by veterinarians / researchers including data collected during the annual AfriCat health checks:

Reference intervals for selected serum biochemistry analytes in cheetahs (*Acinonyx jubatus*)

The study was conducted in order to establish reference and baseline values of serum biochemistry analytes in captive and free-ranging cheetahs. Study animals were 30 captive cheetahs from the AfriCat Foundation and 36 free-ranging cheetahs from central Namibia. Analytes that were analysed were for example sodium, potassium, magnesium, chloride, urea and creatine. They also investigated effects of captivity status, age, sex and haemolysis for the cheetahs. The results were then compared to the international species information system and results showed that found references were more narrow. Age, sex, and haemolysis didn't show a significant effect. Values were compared between captive and free-ranging cheetahs. Captive cheetahs showed higher urea values, most likely due to a higher protein diet. Results can be used for future health and disease assessments in captive and free-ranging cheetahs.

Comparison of high definition oscillometric and direct arterial blood pressure in cheetahs  
Blood pressure measurements reveal important insight in health of cheetahs, but are often difficult to obtain from wild animals and therefore usually requires the immobilisation of the animal. Therefore it is important to evaluate non-invasive methods to measure blood pressure in order to avoid the stressful process of immobilisation in the future and find a suitable device that is accurate and useable in zoos and the field.

In the study an invasive and non-invasive method of gaining blood pressure measurement were compared. 8 captive cheetahs from AfriCat from 4-13 years of age, unrelated.

Invasive: Catheter was applied to femoral or dorsal pedal artery.

Non-invasive: High definition oscillometry where a cuff is applied to artery under the base of the tail, supplying the tail with blood (gives readings as fast as in 10 seconds - important especially for conscious animals) small and portable, therefore - convenient under field conditions. Systolic, diastolic and mean arterial pressure was measured.

Results: both method showed similar results for the mean arterial pressures, and the least agreement for the systolic pressure. HDO showed overestimations compared to direct measurements when measures in the femoral artery and underestimates when measures in dorsal pedal artery in all three parameters suggesting a difference in pressure in all three arteries, dorsal pedal being the highest and femoral being the lowest, tail intermediate (if HDO correct) - this results also found in humans, dogs and rats.

Limitations: lack of calibration, simultaneous readings with direct measurements impracticable, very sensitive to movement.

However, results are promising, but can't yet be fully validated due to the limited sample size





#### Single-incision laparoscopic sterilisation of the cheetah

Study to describe laparoscopic ovariectomy and salpingectomy in cheetahs by using single-incision minimal invasive surgery due to requirement of all large carnivores in captivity being sterilised. First study to perform laparoscopic sterilisation in cheetahs.

Study animals were 21 cheetahs and were randomised to either receive ovariectomy or salpingectomy. No significant difference in age and weight of cheetahs.

Results: duration for ovariectomy longer (24min) than for salpingectomy (19.5 min).

Volume of CO<sub>2</sub> that was used to insufflate the peritoneal cavity was not significantly different in both procedures, but significantly more CO<sub>2</sub> was used for a complete ovariectomy due to the fact that after the removal of ovary number 1 the peritoneal cavity had to re-insufflated.

Conclusion: Laparoscopic sterilisation can be performed in cheetahs without any complications. Lean physiology provides optimal conditions for a laparoscopic surgery.

The single incision port can reduce surgery duration and limit the risk of trauma of the surrounding organs, but has however a higher risk of herniation compared to multiple port access system.

#### Laparoscopic salpingectomy in two captive leopards (*Panthera pardus*) using a single portal access system

Laparoscopic salpingectomy was performed on two adult leopards using a single incision access system.

Surgery was done without any complications and is recommend as a safe use in leopards.

However, long-term effects of salpingectomy on uterine health and mammary carcinoma has still to be determined.

Study confirmed that the anatomy of the ovary and salpinx similar to those of cheetahs and lions and that the surgical procedure was very similar to those previously described in cheetahs and lions and is recommended as a fast and easy surgical option for permanent sterilisation.

Ultrasonic and laparoscopic evaluation of the reproductive tract in older captive female cheetahs

21 female cheetahs examined, median age of 11, never given birth—ultrasonography (US) of the reproductive tract was used to characterise features of the estrus cycle of elderly female, captive cheetahs. Findings of the ultrasound were compared to direct visualisation during a laparoscopic sterilisation which was done immediately afterwards. Both methods were used in combination to evaluate estrus status of the animal.

6 cheetahs hormonally contracepted at least once during their life time. Uterine body, horns and ovaries and surrounding structures were examined - differences in size in active cycling and inactive groups of cheetahs. US provided valuable insight into reproductive status of cheetahs.

Ovaries that lacked structures that are associated with normal cyclic activity proved to be difficult to visualise via US, but usually uterine horn was found helped finding the process of the ovaries. Ovarian activity in Older nulliparous females no influence on ovarian volumes. US identified 5 cheetahs with features of mild uterine pathology. High portion of sample population showed ovarian activity and had a prevalence of paraovian cysts, but significance in undefined in cheetahs and not known to influence fertility. History of hormonal contraception didn't have an influence on reproductive activity or uterine pathology, but lacked in showing functionally significant pathology of the tubular tract. Transabdominal ultrasound was found to be a good method in combination with cytology and serology to evaluate ovarian activity in captive cheetahs. US provided valuable insight together with laparoscopy into reproductive status of cheetahs.





Effect of portal access system and surgery type on surgery time during laparoscopic ovariectomy and salpingectomy in captive African lions and cheetahs

Study implemented to compare surgery times for laparoscopic ovariectomy and salpingectomy (removal of Fallopian tube) in female African lions (adults and cubs) and cheetahs and compare the use of multiple portal access system and a single portal access system between the groups. Procedures were allocated randomly to the two groups.

A three separate port system was used for all lions and a single incision port was used for all cheetahs.

Results: OPT: first time the right ovary was visualised to the time surgery on the left ovary was finished. Adult lions and cheetahs showed shorter surgical times for salpingectomy compared to ovariectomy, no difference found in lion cubs below 24 months of age. The heavier the individual the longer the procedure (cheetah-lion cub-adult lion).

Port placement time (PPT), suturing (ST) and total surgical (TST - first incision to complete skin closure) time significantly shorter when only a single incision was done compared the three port system., but no difference in operative time.

Conclusion: Salpingectomy faster than ovariectomy in adult lions and cheetahs since it is technically simpler procedure, time for port placement and suturing similar, difference in operative time. Placement and suturing of single incision ports faster when compared to three port system.

Laparoscopic removal of a large abdominal foreign body granuloma using single incision laparoscopic surgery (SILS) and extraction bag in cheetah

This is the first report to describe the laparoscopic removal of an FB (foreign body) - induces granuloma from the abdomen of a cheetah. An 11-year old female cheetah was presented for routine laparoscopic ovariectomy. A mass was palpated during clipping of the abdomen and a subsequent Abdominal ultrasonography found a 6 cm diameter mass, not associated with any specific abdominal organ, in the mid right abdominal cavity. For removal an extraction bag was introduced through a 5-12 mm SILS port, the mass was placed into the bag. Subsequent macroscopic examination of the excised mass revealed a firm yellow-white soft tissue mass. On serial incision through the specimen, a 25 mm thorn-like structure resembling that of *Dichrostachys cinerea* (Sickle or Chinese lantern bush), a common thorn tree in Northern Namibia. Entrance of the thorn into the abdominal cavity remains speculative, but it could have either entered via a needle-puncture of the skin or via the gastrointestinal tract.

## Constraints and Challenges

The annual health examinations require a large team of veterinarians, veterinary technicians, and other personnel. The accommodation and transport of these people as well as the cost of anaesthetic drugs, consumables, and equipment create a significant financial burden for AfriCat in the absence of major research funding.

The transport of temperature-sensitive samples to laboratories in South Africa still has to be improved.



## Future Plans

The 2016 annual health checks will take place between 26 July and 7 July. In 2016 a team from the faculty of Veterinary Science at the University of Pretoria will focus on hyperthermia situations during the darting of captive and free-roaming cheetahs (*Acinonyx jubatus*).

Although not many people are aware of the fact, one of the most frequent causes of deaths in cheetahs during immobilisation is hyperthermia (overheating). This phenomenon has not been studied or described much at all, but the annual health checks at AfriCat have provided Dr. Adrian Tordiffe and colleagues a unique opportunity to study and learn more about this problem - to try and understand what causes it, and to begin to develop ways of managing and preventing it. In cheetahs who develop hyperthermia, temperatures measured shortly after darting can be over 40°C and are sometimes still rising. If the body temperature is not brought down rapidly this can have severe consequences for the cheetah - brain damage, damage to the digestive tract, and/or cardiorespiratory failure.

Continuation of anaesthesia and microbiome study and gastric biopsy collection of captive and free-ranging carnivores.





## Programme 2: Carnivore Care

### Objectives

As detailed in Section 1, AfriCat initially operated only a Rescue and Release Programme, which developed as a result of the Hanssen family's relationship with the local farming community. Through this programme, more than a thousand carnivores were rescued from farms where they would have otherwise have been killed, and over 85% of them were released where they would not be persecuted. Those that could not be released entered AfriCat's Carnivore Care Programme.

AfriCat currently holds 15 cheetahs in its care that are young, fit, and wild enough to be part of the Rehabilitation Project (see Programme 3). There are, however, 34 cheetahs, 4 leopards, and 4 lion too old or tame to go back into the wild. These individuals are going to live out their lives under the expert care of the AfriCat team and continue to be "ambassadors" for their wild counterparts. AfriCat's Carnivore Care Centre aims to provide a healthy living environment for the large carnivores in temporary or permanent captivity and to minimise illness and injuries as far as possible.

Assisting Research: Keeping large carnivores in captivity in Namibia requires a Permit from the Ministry of Environment and Tourism. One of the conditions of this Permit is that a veterinary inspection is carried out once a year. As discussed in Programme 1, the annual health examinations of the cheetahs at AfriCat give invited specialist veterinarians the opportunity to conduct research on various aspects of animal health, particularly those relating to the health of large carnivores in captivity. As well as providing expert information on the health of AfriCat's animals, the examinations also allow for the comparison of results with similar studies being conducted on large carnivores in other captive facilities across the globe.

Some of this information can also be used to gain insight into the health of large carnivores in the wild. On-going collaboration with scientists and the conservation authorities and working closely with the farming community allows for studies to be conducted that provide valuable information on large carnivores and their long-term conservation in Namibia. Researchers have been involved in a number of studies involving captive cheetahs at AfriCat's Carnivore Care Centre (<http://www.africat.org/program/research>).

AfriCat continued to collect blood and urine samples of all cheetahs and leopards captured on farmland and released back into the wild, to add to the existing collection of samples started when AfriCat first began operating in 1991. These samples are available for research and analysis.

Conservation through Education: The animals in AfriCat's Carnivore Care programme support conservation through education – local school children who are unfamiliar with wild animals are able to see these animals at close quarters and learn to appreciate their beauty and value. The animals in captivity at AfriCat provide opportunities to increase awareness of their wild counterparts and their conservation priorities to the children at the Education Centres as well as to foreign visitors to Namibia.

AfriCat started out with a mission statement to "keep wild cats wild", hence 'A free Cat'. Concentrating on Adult and Youth Education, initiating wild cheetah research and evolving the Rehabilitation Project to such an extent that it becomes a worldwide model for Reintroduction, are all in keeping with that early statement.

## Main Activities

- Buffer fences 1.2 meters high and 1.5 meters away from enclosure were erected based on new government regulations for all leopard and lion enclosures.
- A vertical electrified fence element was added to all enclosure fences to prevent carnivores from climbing out.



- Shade nets were erected between adjacent leopard and cheetah enclosures to prevent habituation for future rehabilitation purposes.
- Two new panel to panel houses were built for AfriCat staff close to the AfriCat information centre. The building of the houses is ensuring less traveling distance and will allow all AfriCat team members to be easily available when a clinic emergency arises



## Major Achievements

Completion of the first of three lion hides that allows tourist and school groups to watch and study our ambassador lions from a safe environment.

The maintenance and improvement of all carnivore enclosures including cheetah, leopard, and lion enclosures, was completed.

Small catch-camps were built alongside each enclosure to enable improved research opportunities and allow animals to feed inside on specialised rubber mats to prevent permanent teeth damage.

Two successful health examinations were undertaken in 2014 and 2015 led by Dr. Adrian Tordiffe from the Faculty of Veterinary Science at the University of Pretoria (UP), and Dr. Gerhard Steenkamp from the Faculty of Veterinary Science at the University of Pretoria (UP).

The AfriCat clinic was registered as official veterinary clinic by the Namibian Veterinary Council (NVC).



The veterinary checks fully evaluated the health of all captive animals in the Carnivore Care Centre.

In the past two years, the AfriCat clinic was transformed into a high-tech surgical theatre. Visitors and staff were able to watch every detail of the surgery on television screens stationed outside the theatre.

As with any new technique, or research project - all aspects of the procedures performed at AfriCat are accurately documented so that the methods and research are published in an international veterinary journal at a later stage.



## Constraints and Challenges

Running costs for keeping captive carnivores fed with a well-balanced diet and vitamin and mineral supplements to prevent deficiencies have significantly increased. This has increased the financial burden on AfriCat and reduced the availability of funds for other Programmes such as Education and Research.

The animals at AfriCat are housed in spacious enclosures of between 12 and 50 acres in a natural, stress-free environment, but the high rainfall during the past few years had presented new challenges:

- (i) dense bush encroachment and high grass which present a fire hazard, and
- (ii) an influx of cheetah-flies (genus *Hippobosca* - family Hippoboscidae).

At other times of the year, drought conditions caused havoc when hungry warthogs forced themselves into the Carnivore Care Centre enclosures and injured several cheetahs, fatally killing one.





## Future Plans

To further build out the display room at the Carnivore Care Centre, in order to create a wider display of AfriCat information and research findings, which allows for school groups, visitors and AfriCat/Okonjima staff to learn more. The Centre will also create wall space to display all endangered carnivores of Namibia and the world at large, and more information on how to conserve them.



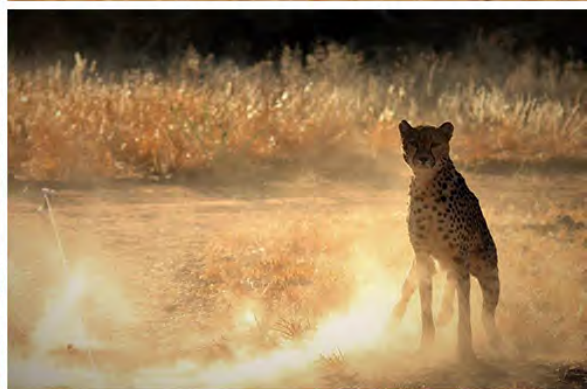
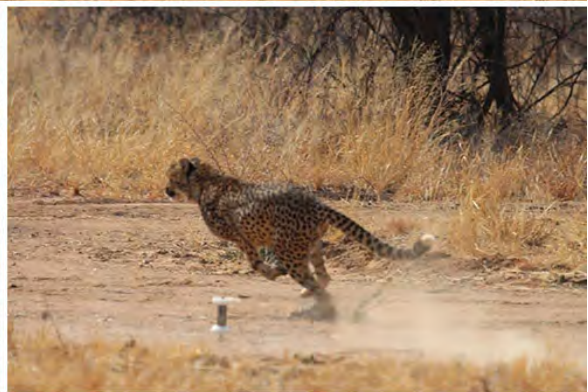
Designing, installing, and perfecting a specially designed cheetah exercise lure system: This lure is a fantastic way to keep the cats at our Carnivore Care Centre fit and also serves as a great education tool for visitors- both kids and grownups - to see the cheetahs at full speed, doing what nature intended them to.

There is a variety of different excursive lures on the market, but this one consists of a simple motor, a casing that covers the rope & pulley-system, which is nailed to the ground. The string/rope to which the 'fluffy lure' is tied, is embedded into the casing, to prevent it from cutting the legs of the cheetah when charging at full speed. It was initially designed for greyhounds, but also works very well for cheetahs.

The lure is made of a soft material that will not injure the cheetah's wrists or claws, compared to the South African lures.

Initiation of a long-term cheetah-fly control study in captive carnivores.









### Programme 3: Environmental Education

AfriCat has discovered that, for many Namibian children and adults, the AfriCat Environmental Education Programme is their first camping and outdoor educational experience. Few have had the opportunity to visit wildlife reserves, observe antelope and wild large carnivores, and to experience the natural wonder of their own country. Neither have they been introduced to the vocational opportunities which tourism visitation, hand-in-glove with conservation, offers. AfriCat has advocated environmental education since 1998 and acutely recognises the urgent need to offer as many learners, of all ages, exposure to the enormous challenges facing Namibia's increasingly fragile natural heritage. It offers constructive solutions and an alternative to the present path.

AfriCat provides Environmental Education programmes for the youth of Namibia with the hope of guiding them towards a greater understanding of the crucial importance of the natural world and of wildlife conservation. The main objective is to promote holistic environmental awareness among Namibian youth with emphasis on the role of Namibia's large carnivores. After many years of working with the farming community, it became clear that youth education was vital to the long-term conservation of large carnivores. The programme has already reached over 25,000 children and young adults at AfriCat's two Education Centres and through its Outreach Programmes.

The AfriCat Environmental Education Programme aims to inform and empower Namibia's youth about large carnivores, conservation, and the Namibian environment through an experiential learning opportunity.



## Objectives

The objectives of the Environmental Education Programme, based on the 1997 UNESCO-UNEP Environmental Education objectives, are as follows:

- To develop holistic, environmental awareness, sensitivity, knowledge, attitudes, and values among Namibian youth.
- To promote all aspects of sustainable living.
- To emphasise the importance and responsibility of each individual to contribute to the conservation of the environment.
- To increase knowledge and understanding of Namibia's large carnivores showing that they are an integral, essential, and magnificent part of the Namibian ecosystem.

AfriCat's Environmental Education Programme aims to achieve these objectives by:

- Providing fun and interesting environmental education camps ranging from 2 – 5 days, based at the AfriCat Environmental Education Centre or the AfriCat North Wilderness Camp.
- Utilising the AfriCat Information Centre and the non-releasable cats as carnivore 'ambassadors'.
- Utilising the Okonjima Nature Reserve and/or Northwestern Namibia to enjoy and experience nature; to see and learn about the fauna and flora of Namibia.
- AfriCat North programme: Youth of all ages are encouraged to become involved in this programme, where active participation enables them to learn more about lions in general, their role within the natural ecosystem and the problems facing lions due to loss of ideal habitat, disease, and drought. Issues such as Human-Wildlife Conflict and improved livestock protection methods are encountered and the students are then actively involved in trying to solve these crucial problems.



## Main Activities

The choice of activities employed by each environmental education camp varies considerably depending on the age, size of the group, ability, whether a school class or a club, specific requirements of the group, and the chosen location. Possible activities include:

**Nature walks and mountain hikes:** Seeing, feeling, basic survival skills in nature e.g. learning to dig for water in the 'dry' river beds; learning to appreciate Namibia's beauty. Topics discussed while on trail: tracks and tracking, animal behaviour, cultural appreciation, bush encroachment, useful trees and shrubs, insect colonies (e.g. termites), birds, common bush-sounds, river systems, erosion, and general topics of ecological concern.

**Sunrise walks and incorporation of life skills:** Experience the dawn and understand the importance of exercise and balance, i.e. all things in moderation (mind, body, and soul development). Throughout the course there is incorporation of life skills that can be learned from nature, e.g. the large spider on the "Education Wall" at the AfriCat Information Centre symbolises how much a small individual can accomplish through perseverance. If disaster strikes (web breaking), it is important to pick oneself up, re-use skills or talents, and start again (spider re-using web and rebuilding, time and time again if necessary).





**Game drives in the 20,000 hectare Okonjima Nature Reserve:** On these drives students can experience for themselves one of Namibia's main tourist attractions i.e. game viewing. The experience is in itself a novelty, let alone being able to actually see the animals close up and for the first time in many cases. The topics discussed are similar to those on nature walks, as stated above. Depending on the length of the course, the students observe the behaviour and particular habitat of each animal so that they can then make their own deductions regarding its particular niche in the ecosystem. Some of the activities on the game drives are as follows:

- Game counts on the first cleared area in the Okonjima Nature Reserve known as "Serenjima Plains".
- Breakfast in the bush, usually at a dam where one finds many smaller creatures to study in a different mini-ecosystem.
- Using radio telemetry equipment to track carnivores in rehabilitation. Fortunate students are able to observe some carnivores hunting their natural prey.
- Bush Clearing. The younger children usually work on the re-growth, while the more senior students can tackle the bigger invaders.
- Clearing of old fence lines, especially any stakes or tangled wire.
- Clearing of invasive alien plant, mainly *Datura innoxia* and *Datura ferox*, as well as various *Opuntia* and Spiny Cactus species.
- A favourite is the game drives in the sandy riverbeds before sundowners. "Thirsty Oryx" involves the children having to find water in the riverbed. This is always enjoyed and provides competition, while at the same time they are experiencing the beauty of dusk.

**Sessions at the AfriCat Carnivore Information Centre:** The AfriCat Information Centre has huge visual displays covering a large number of topics, e.g. skulls, skins, bone, full animal mounts. These topics are discussed, including the research undertaken by visiting veterinarians at the AfriCat Foundation. Explanations are given of the 'EE Wall' which is the side wall of the new clinic. The art on this wall acts as a summary, a teaching tool, or a reminder of the essence of this programme.

**'Under Canvas' or 'Under Trees' class sessions:** The main discussion focuses on the 6 large Namibian carnivores still found on farmland. The sessions look at those carnivores which have already been eradicated on commercial farmland, as well as those which are still surviving, and consider ways to maintain such existence. In particular, differences between leopards and cheetahs, both physical and behavioural are evaluated. There are also discussions regarding carnivores as indicators of ecological stability; where humans fit in; what can be done; and other discussions/presentations, with as much student involvement as possible include over-population, global warming, urbanisation, consumerism, energy inefficiency, pollution, and loss of biodiversity.

**Time spent studying carnivores up close at the Carnivore Care Centre:** Learners have the opportunity to see leopard, lions, and cheetahs in large, natural enclosures. This gives the students time to really notice their amazing adaptations and magnificence (absolutely no physical contact permitted between students and animals).

**Night walks:** Experiencing the wonders of the night sky; identification of nocturnal animals and insects; identification of nocturnal sounds; walking and experiencing using other senses; experiencing real darkness (which is now so rare for most youth residing in urban settings) and, for many, overcoming fear of the dark by being encouraged to push themselves out of their comfort zone; basic planet constellations and stargazing.

**Sustainable living activities:** Solar cooking, recycling, compost making, tree planting, utilising natural wild vegetables etc.

**Educational games:** ‘Run like a Cheetah’ and ‘Stalk like a Leopard’. This involves wearing the radio collars, then hiding from fellow students who then have to find their ‘collared’ colleague by using telemetry equipment.

**Hands on activities:** e.g. kraal building, bush clearing, erosion control, fence clearing.

**After class activities:** Swimming, reading, relaxing in the wild with no modern technology – with only nature as entertainment.

**AfriCat North:** Certain programmes incorporating higher education or adult education also include a 3-7 day trek on communal farmland, meeting farmers and traditional leaders, as well as physical work assisting the Ministry of Environment & Tourism (MET) and farmers in repairing sections of the Etosha fence. This experience gives the students detailed insight into the complexities of Human-Wildlife Conflict (HWC) and AfriCat North’s mitigation programmes. Students may also camp in the ‘wild’ and gain first-hand experience of Lion immobilisation and FIV-testing (Feline Immuno-deficiency Virus). Since 2010, youth groups from Namibia, as well as from overseas, have participated in the on-going HWC Mitigation & Community Support programmes by repairing fences, building nocturnal kraals to improve livestock protection, uplifting community schools by erecting water tanks, laying pipelines, and developing playgrounds and sports fields.





## Major Achievements

The interest in, and the popularity of, our programme has grown considerably in 2014, especially at the more influential schools which, as we feel, is an important and significant direction.

We will still emphasise “quality over quantity”. By working with smaller numbers of students, we feel that we end up with more committed students than if we tried to push through larger numbers of them. Working with larger numbers of students can become more entertainment than education.

We have had very successful outreach programmes. Due to the large size of classes (50+), we encourage the staff to select ten of their best students and ten of their most interested and talented students to attend one of our week-long programmes at the AfriCat headquarters. We have set the month of November aside for camps, for students in grade 10 and grade 12 who have finished their national exams. This has proven to be very effective.

Each year we still receive a volunteer, even though we have now changed from our first organisation. Ms. Annika John was our first volunteer, who was replaced by Ms. Nomi Sonntag. Mr. Marvin Dzikowski is our current volunteer. As soon as our second teacher is settled in (May 2016), our staffing requirement will be sorted.

Fortunately, we have received a new Nissan pick-up from the Pupkewitz Foundation. The head of the Pupkewitz Foundation has decided to cover the vehicle with the AfriCat logo and carnivore brandings, in the hope that it attracts positive reactions and more support for our programme.



## Constraints and Challenges

The main constraints have been a lack of funding for the programme and a shortage of transport for educators to use on a daily basis. As the AfriCat Environmental Education Centre is now 6kms away from the main AfriCat office and staff accommodation area, there is a need for a quad bike for junior staff to use for their daily transport, and that is large enough to carry a good quantity of stuff.

## Future Plans

In 2016, we are looking at building a nice, weather proof meeting place/classroom at our centre. AfriCat is also looking to build a suitable house down at the centre to accommodate our second teacher. We also want to replace the tents with A-frames, which will be built in a rustic manner.

There is intent to extend the Adult Education Programme to include Environmental and Nature Conservation students from the Namibia University of Science and Technology (NUST) and Education Faculty students from the University of Namibia (UNAM), community farmers, and community game guards.

Once the second teacher is in place, Helen Newmarch will spend more time fundraising and marketing for the EE programme and she will continue negotiations with the local tertiary education institutions (NUST & UNAM).

AfriCat also plans to maintain the interest and support of participants in AfriCat's Environmental Education camps once they return to school by encouraging them to continue to support AfriCat's activities through one or more of the following:

They can support AfriCat by either 'Adopting-a-Carnivore' as a class or as an individual;  
Engage their colleagues and friends to conduct a joint fund-raiser to raise donations and awareness for AfriCat's Environmental Education Programme;  
Hold competitions, run a marathon in AfriCat's name, swim for AfriCat, play football for AfriCat, arrange a jumble sale, an auction, and other fun events to motivate their fellow students and friends to raise donations for AfriCat.





## **Programme 4: Rehabilitation and Rescue & Release**

### **Objectives: Rehabilitation**

AfriCat's Cheetah Rehabilitation project was initiated to give captive cheetahs an opportunity to return to their natural environment. Although hunting in carnivores is instinctive, many of the cheetahs at AfriCat lack experience due to being orphaned or removed from the wild at an early age. This inexperience, as well as their conditioning to captivity, makes these animals unsuitable for release on farmland. The cheetahs (usually a coalition of brothers and sisters) are fitted with radio-collars before their release into the 20,000 hectare Okonjima Nature Reserve, so that their welfare and progress can be closely monitored. Rehabilitated cheetahs are not released on farmland.

Besides giving the cheetahs a chance to return to the wild, the success of this project provides other substantial benefits, as it gives AfriCat the opportunity to assess whether rehabilitation is a successful means of conserving an endangered population and it also allows for the number of cheetahs in captivity to be reduced.

### **Objectives: Okonjima Nature Reserve**

The objective is to turn the 20,000 hectare Okonjima Nature Reserve, once denuded and eroded farmland, back to its natural state, by optimising the herbivore population and the related carnivore density, in order to underpin this Nature Reserve's sustainability. The symbiotic relationship which exists between the AfriCat Foundation and the Okonjima Nature Reserve is imperative. Without education, research, and the mitigation of farmer-predator conflict throughout Namibia, the essential conservation of large carnivores would

falter; and without the substantial financial support offered by foreign visitors, who stay in the Okonjima lodges, neither would survive. This mutually beneficial relationship enables interested visitors to experience, first hand, the work of the AfriCat Foundation, gaining valuable insight into carnivore conservation and, at the same time, creating the platform for donating much-needed funds to the AfriCat Foundation and its programmes throughout the whole of Namibia: Environmental Education, Carnivore Research, Rescue-Release & Rehabilitation, Carnivore Care, and Human Wildlife Conflict Mitigation and Community Support.

The 20,000 hectare Okonjima Nature Reserve was established with a 2.2 metre-high electrified, 98kms long, perimeter fence to control predator movement, enabling research to monitor predator movement and density studies within an 'island-bound' conservation wilderness. The main reason for fencing the Reserve is to establish a protected environment for the AfriCat Rehabilitation Project (and Rescue & Release Project). It will certainly take time for the AfriCat Environmental Education Programme to have the desired effect on people dealing with carnivores on open farmland. Because most captive carnivores have lost their natural fear of humans, the cheetahs released into the Reserve would be shot by neighbouring farmers, if it was not fenced. It would not be possible to achieve the objectives of the Rehabilitation and Education Programmes in this Reserve, if there was the chance that they could leave the protection of the Reserve and be shot on neighbouring farms. The presence of 'tame' carnivores on adjacent farmland would have resulted in increased, indiscriminate shooting of these animals and, with the increased number of antelope moving from the Reserve onto neighbouring farms, the hunting thereof for meat would also have increased. Thus, these programmes are undertaken and monitored within the Reserve borders, with the removal and addition of prey species as necessary for the purpose of research and equilibrium.

The enclosed wilderness area is also part of a project to prove to farmers that one can farm alongside carnivores and that they do not adversely diminish populations of indigenous game. Research has shown that the Okonjima Nature Reserve has up to 3 times the number of carnivores normally occurring in a fenced area of this size. Even with these high predator numbers, over a period of 13 years, the game numbers increased annually. This has proven that increased predation stimulates reproduction.

### **Objectives: Rescue and Release**

AfriCat works closely with communal and commercial livestock farmers, trying to assist in alleviating some of the losses from predator intrusion. Since 1993, AfriCat has rescued over 1,080 cheetahs, lions and leopards on Namibian farmland. Over 85% of these animals have been returned to the wild. However, the animals were released into new territories, belonging to others. In their 'new territories' they needed to either fight for their new home or 'run the gauntlet' of the farmers' traps and guns, back to their former



territory. AfriCat is, therefore, entirely uncertain as to how many of the released carnivores survive this re-location. AfriCat has therefore curtailed the nationwide Rescue and Release Project and at present only release into the Okonjima Nature Reserve, or back into the same area in which the carnivores were captured.

## Main Activities

Monitoring the dynamics of five different rehabilitated cheetah groups in the Okonjima Nature Reserve and one pack of rehabilitated African Wild Dogs.

Rescue of three orphaned African Wild Dog pups who were found abandoned and in poor condition and handed to AfriCat by the Ministry of Environment and Tourism (MET) in June 2014.



### **WILD DOG MANAGEMENT PLAN:**

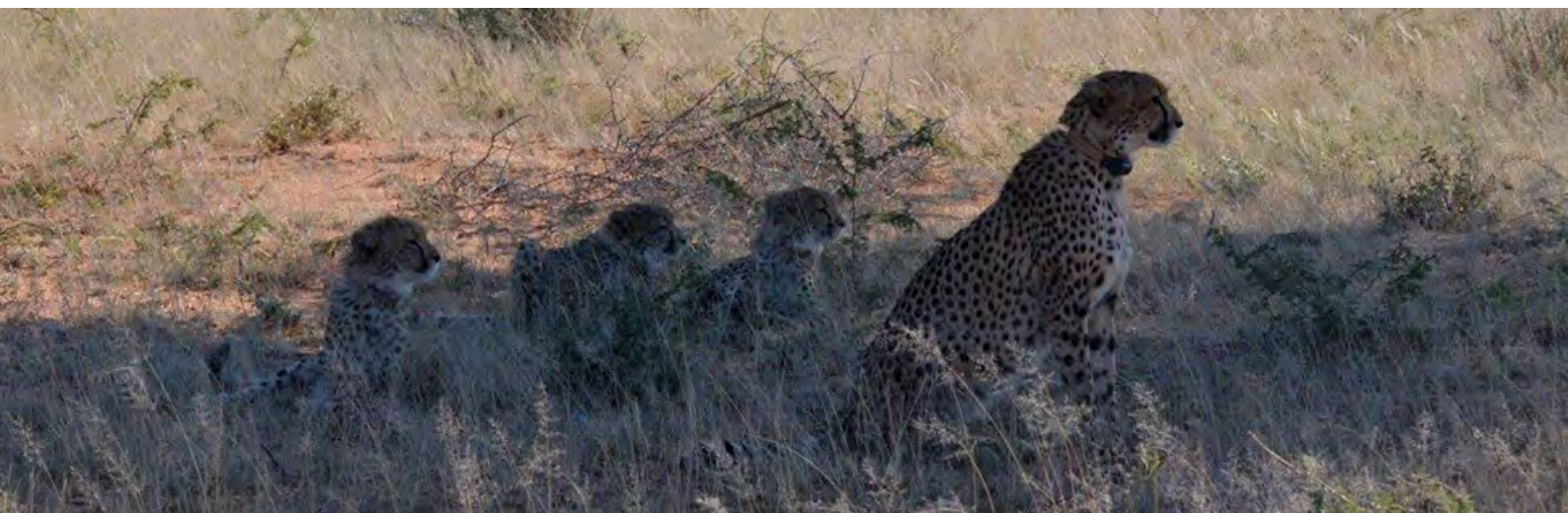
The pups are being prepared for rehabilitation to the Okonjima Nature Reserve.

**Short Term:** The pups will be housed in their present enclosure as the first step of their rehabilitation. When the pups are acclimatised to natural vegetation and have learned to avoid electric fencing, they will be moved to a larger (5 ha) fenced rehabilitation camp bordering the 20,000 ha Okonjima Game Reserve in order to prepare them for release into the reserve.

**Introduction to Older Dogs:** The older wild dogs may interact with the pups if they approach the rehabilitation enclosure while the pups are housed there. Interaction between the dogs and the pups (across an electrified fence) will be encouraged by attracting the older dogs to the rehabilitation camp with the use of dragged bait and wild dog calls. The rehabilitation camp may be divided in two, in order to enclose the adult dogs in close proximity to the pups. The behaviour of the dogs and pups will be closely monitored during these interactions to assess whether the older dogs could possibly incorporate the pups into their pack.

Long Term: If the interaction between the pups and the adult dogs is promising, the two groups will be acclimatised until an encounter between the groups without a fence between them will pose as little threat to any of the dogs as possible. If both groups accept each other they will be enclosed in the rehabilitation camp together and later released. We believe that this will be the best possible scenario for the continued rehabilitation and welfare of the pack. If the existing pack is antagonistic towards the pups, repeated introductions between the two groups will continue under different conditions until either the dogs accept each other or we decide that the groups cannot be safely combined. If a safe combination of the packs is impossible, the pups will be rehabilitated without the adults. They will then either be released onto the reserve separately from the existing pack, in an area far from the pack's home range, or retained in an area separated from the older dogs by electrified fences. If the new pups cannot immediately be released onto the Okonjima Game Reserve they will be released at a later stage. It is AfriCat's policy not to allow these pups to remain in captivity longer than strictly necessary. Before release, the male dogs will be vasectomised and all three collared with radio collars. After release, the dogs will be monitored intensely by AfriCat and Okonjima staff and viewed by guests as ambassadors for the species.

Rescue of a female cheetah cub in May 2015 in Walvis Bay.



Relocation of Dizzy, a successfully rehabilitated cheetah female, and her three cubs into Alcatraz, a soft-release camp located within the 20 000 hectares Okonjima Nature Reserve in August 2015 to secure the best chance of survival of her three cubs in a high leopard density environment; Dizzy and her cubs were re-released into the reserve in May 2015.

Relocation of Nyx, one of Dizzy's cubs (see above) in May 2015 to AfriCat's Carnivore Care Centre to recover from a tibia and pelvis fracture after being released into the reserve. Nyx died in June 2015 due to unforeseen complications.



An attempt of social integration of two unrelated Wild Dog packs and re-introduction in the Okonjima Nature Reserve

It may be impossible to introduce the pups to the older pack without conflict. Even after successful introduction and release together, intra pack fighting may still be fatal to some dogs. This may be exacerbated because despite our best efforts all the dogs were raised in an artificial manner without the supervision of adult Wild Dogs.

We feel that a pack of three is too small to function as a Wild Dog pack. The older dogs, although independent and successful hunters are not as successful as a larger pack would be. The pups may find it difficult to develop their hunting skills as such a small unit if they are forced to do so alone.

## Major Achievements

Release of four additional captive cheetahs into the Okonjima Nature Reserve in September 2015.



Successful rehabilitation of the three orphaned wild dog pups Jogi, Messi, and Robin into the Okonjima Nature Reserve and successful integration of one adult female wild dog into the pack.

Steps of rehabilitation programme of orphaned wild dog trio Yogi, Messi and Robin from July 2014 - July 2015:

Time Frame	Steps of Rehabilitation Programme
13 July 2014 - 14 Sept 2014	Semi-open holding facility at AfriCat Carnivore Care Centre.
15 Sept 2014 - 01 Dec 2014	Translocation to 200m <sup>2</sup> holding camp at AfriCat Carnivore Care Centre.
02 Dec 2014 - 27 May 2015	Move into 3 ha camp displaying natural vegetation and surrounded by electrical fencing.
28 May 2015 - 12 July 2015	Translocation to 5 ha soft release camp, located within 20,000 ha Okonjima Nature Reserve (known as Alcatraz).
31 May - 12 July 2015	Social acclimatisation phase: 5ha camp divided in half, Ricky and Raine housed adjacent to the trio, in the other side of the soft release camp (31 May 2015).
09 July 2015	Opening of dividing fence; and first physical introduction of the two Wild Dog packs.
13 July 2015	Release into 20,000 ha Okonjima Nature Reserve.
13 July 2015 - 26 July 2015	Initial excursions and explorations in close proximity to the release site and regular returns to release site.
27 July 2015	Second physical introduction to Ricky and Raine outside of soft release camp (Alcatraz).
28 July 2015	Raine sustained fatal head and body injuries after repeated attacks from the young dogs.
30 July 2015	(Temporal) integration of Ricky into pack.

100 springbok have been introduced into the Okonjima Nature Reserve as suitable prey species for rehabilitated cheetahs.

AfriCat hosted their first farmers meeting that explained carnivore movements and the negative implications of removing predators from their property. Interested farmers were invited to visit the Reserve to see how a high density of leopard can stimulate increases in the prey populations and how electric fencing can stop predator movement and protect livestock.



## Constraints and Challenges

The high density of leopards and the resulting strong overlap of home ranges between leopards and cheetahs are contributing to the high rate of interspecific competition and thus, mortality rate of cheetahs in the reserve. Predator-avoidance strategies such as natural large ranging patterns and the utilisation of hunting grounds in areas of low predator occurrence are difficult to implement due to the fence restricted useable area. With the opening of more suitable habitat in the reserve for cheetahs in form of open plains and the introduction of more suitable prey species such as springbok, it is hoped that reintroduced cheetahs will have a better chance of survival in an area of high leopard density in the future.

Despite in-depth research on Wild Dog introductions, the biggest risk with the artificial bonding attempt of two unrelated Wild Dog packs we were facing was rejection and the occurrence of fatal aggression between the two groups. Because separated hierarchies exist in males and females and are maintained within each sex. For this reason, artificial integration of opposite-sexed groups is favourable mimicking a natural situation where a dispersing male group is joining a dispersing female sibling group from another pack where hierarchies are already established upon formation process. The fact that both our groups included females represented a difficulty from the starting point and implied a tendency for aggression between the females of both packs.



## Future Plans

Rehabilitation of more captive cheetahs into the 20,000 hectares Okonjima Nature Reserve to reduce number of cheetahs in captivity.

Constant removal of invasive bush to create at least 7,000 to 10,000 hectares of open plains for introduction of more game. This will greatly enhance the AfriCat rehabilitation projects.

Purchasing more radio-collars for leopards, cheetahs and hyenas (brown and spotted) to monitor carnivore interactions and interspecific behaviour patterns in a protected and enclosed environment.

Evaluation of cheetah rehabilitation success rate over the last 20 years in the Okonjima Nature Reserve.







## **Programme 5: Human-Wildlife Conflict Mitigation and Community Support**

### **Objectives**

To mitigate Human-Wildlife Conflict on farmland, especially with regards to the lion (*Panthera leo*), by educating youth, encouraging adapted livestock management, and conducting essential research and monitoring of wild lion populations. The Programme is operated by AfriCat North, based, as it is on Etosha's south-western boundary, adjacent to farming communities. AfriCat North has, for many years, been directly involved with Human Wildlife Conflict (HWC) incidents on communal and freehold farmland adjacent to the Etosha National Park (ENP), where conflict situations arise when lions leave the confines of protected areas and kill livestock, resulting in large number of lions are killed annually. AfriCat strives to enable local communities to support themselves without endangering the valuable lion population.

### **Main Activities**

The Human-Wildlife Conflict & Community Support Programme falls within the AfriCat Communal Carnivore Conservation Programme (CCCP) and directly supports and up-lifts the



communal farming communities along the south-western, western, and north-western borders of ENP. By adapting their livestock management and protection methods, both communal and free-hold farming communities will lose less livestock and, with continued support and education, these communities will subsequently destroy fewer lions. The Livestock Protection Project (LPP) runs through the Human Wildlife Conflict and Community Support Programme. It supports affected farming communities to build strong nocturnal kraals and encourages the reinstatement of herdsmen in order to better protect their livestock. AfriCat encourages and supports Lion Guards, selected by the Conservancy Committee, who function as a link between the traditional authorities and the farmers, to lay the groundwork before the Programme begins. Once the communities in conflict have been identified and wish to become involved, AfriCat makes it clear that it will only mitigate such conflict if the communities are prepared to contribute in the form of building teams and, once these kraals have been built, to maintain these structures on a regular basis.



For the farmer trying to survive along the Hobatere & Etosha borders where the boundary fences are porous, as yet, lions have no value; they move from protected areas onto farmland in search of easy prey. i.e. livestock, with little or no compensation or replacement value forthcoming. To add to their dilemma, 2015/16 is the 4th consecutive year of drought.



**Human-Wildlife Conflict Mitigation measures include:**

- Monitoring of the collared individuals' (2014 +2015) has proven invaluable:

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Since mid-2015, large numbers of cattle and donkeys have been found grazing into Hobatere as far as the Hobatere North Lodge (15-20 kms) and the Etosha Roadside (prev. Hobatere Campsite), approx. 20 kms from the southern boundary.

## Major Achievements

The Lion Guards, assisted by a number of volunteers, play a vital role in protecting the Hobatere lions and mitigating lion-farmer conflict on communal farmland. The persistent drought has made for lower tolerance of livestock losses, with conflict mitigation increasingly challenging.



Livestock Protection Programme completes 15th nocturnal, livestock kraal, including the first 'mobile' kraal (Courtesy of the Hwange Lion Research Project and SATIB Conservation Trust, for their design).

Patterns of activity were recorded both via trail cameras placed strategically, the 12-hourly GPS-Satellite downloads and observations by the research team, MET Rangers, Campsite assistants and farmers adjacent to the Hobatere boundary fence.

Hobatere Concession Area and Etosha-west: Distribution patterns and land use of 7 lions clearly indicate range cores within Hobatere and Etosha-west, with:

1. viable populations within the above-mentioned protected areas;
2. no evidence of viable populations within 10 -20 kms outside thereof;



3. cross-border movement is evident but temporary; cross-border movement is influenced by livestock grazing within lion habitat and unprotected livestock alongside protected areas, despite AfriCat's Livestock Protection Programme with 20 kraals built for 'hot-spot' farming communities;

The 'Conservation Through Education' Programme continues through the Onguta 'tented' Primary School when a colourful playground was built by a group of students from the Swakopmund Private School (PSS). Visiting student groups from Dr Challoner's Grammar School and Hampton School, UK contributed to the purchase of GPS-Satellite collars and the erection of the first mobile, livestock kraal, supporting the continued monitoring of lion movement, early warning systems for farmers as well as improved livestock protection options during drought conditions.



## Constraints and Challenges

The persistent drought has presented even greater challenges than anticipated, with large scale livestock mortality and escalated lion-farmer conflict; the outbreak of Foot-and-Mouth Disease in the north-eastern regions of Namibia 2015, led to restrictions on livestock movement and subsequently on the sale of livestock. Animals in weak condition make for easy prey, the lions taking the blame for most deaths. The increased use of leg-hold traps and poison has added another dimension to AfriCat's programmes, emphasising the need for consultations with the Ministries of Environment and Tourism, Veterinary Services and Agriculture.

Due to a number of constraints, the greatest being the lack of an effective communication system between farmers and AfriCat, some of the warnings do not reach the farmers in time.

Further studies have established that the regularity of movement onto farmland has increased since August 2015, due to the persistent drought resulting in migration of wildlife and lions following their prey cross-border; the lions have become habituated to livestock as easy prey, causing them to kill inside of the protected area and outside.

As far as can be ascertained through the monitoring of the 10 marked / collared lions, these lions would be regarded as 'occasional' stock-raiders, chiefly due to habituation caused by livestock grazing inside of protected areas, porous boundary fences and poor livestock management on communal farmland.

The government has been requested by farming communities and traditional leaders, to repair and upgrade the Hobatere Southern Boundary fence, ultimately reducing the exit of lions onto farmland and preventing the movement of livestock into protected, wildlife breeding areas.

Financial constraints have hampered the further development of plans to build four classrooms and ablution blocks for the Onguta Primary School students.

## Future Plans

The onset of Phase 4 of the AfriCat Hobatere Lion Research Project (AHLRP) July 2016, provides encouragement for both farmer and the local tourism facilities: more lions will be collared and marked enabling easier identification and monitoring of lion movement, allowing for improved livestock protection in the so-called 'hot-spots' or conflict zones along the Hobatere Concession and western Etosha borders; closer collaboration with concessionaires, tourism-related management groups and conservation-orientated NGO's operating within the broader study area and communal conservancies indicate an increase in technical support for communal farmers, empowering communities to become self-sufficient, increasing their capacity for an improved lifestyle.

'Conservation Agriculture' courses and work-shops should provide sound arid-adapted farm management, animal husbandry and improved livestock protection programmes, especially once the drought has broken;

When funding allows, developing a more extensive Lion Guard Programme, whereby more conservancy members take on the role of 'keepers of the wilderness'.



### III: Budget and Statistics.

## The AfriCat Foundation Trust

Registration Number T48/93

## Statement of Financial Position as at 28 February 2015

	2015 N\$	2014 N\$
<b>ASSETS</b>		
<b>Non-current assets</b>	11,417,876	12,261,347
Property, plant and equipment	10,593,349	10,005,869
Investments	824,527	2,255,478
<b>Current assets</b>	2,808,117	2,470,349
Receivables	1,442,488	1,544,857
Inventory on hand (curios)	488,562	215,133
Cash and cash equivalents	877,067	710,359
<b>Total Assets</b>	<b>14,225,993</b>	<b>14,731,695</b>
<b>FUNDS AND LIABILITIES</b>		
<b>FUNDS</b>	14,155,993	14,678,609
Opening balance	14,678,609	10,516,020
(Deficit) / Surplus for the year	(522,616)	4,162,589
<b>Non-current liabilities</b>	70,000	53,086
Advance from Okonjima Holidays	-	53,086
Building Fund AfriCat North	70,000	-
<b>TOTAL FUNDS AND LIABILITIES</b>	<b>14,225,993</b>	<b>14,731,695</b>

# The AfriCat Foundation Trust

## Statement of Comprehensive Income for the Year Ended 28 February 2015

	2015 N\$	2014 N\$
<b>Income</b>	<b>5,100,308</b>	<b>8,658,137</b>
Donations	2,781,559	6,534,458
Adoptions	491,843	473,729
Curios	1,496,833	830,408
Okonjima	20,000	472,550
Interest received	70,073	106,993
Rent received	240,000	240,000
<b>Expenditure</b>	<b>5,622,924</b>	<b>4,495,548</b>
Project activity expenditure	1,819,909	1,432,428
Operational expenditure	3,803,015	3,063,120
<b>(Deficit) / Surplus for the year</b>	<b>(522,616)</b>	<b>4,162,589</b>



# The AfriCat Foundation Trust

## Statement of Cash Flows for the Year Ended 28 February 2015

	2015 N\$	2014 N\$
<b>Operating activities</b>		
Cash receipts from donors	5,030,234	8,551,145
Cash paid to suppliers for services	(5,594,920)	(5,960,695)
Cash (utilised by) / generated from operations	(564,686)	2,590,450
Interest received	70,073	106,993
Net cash (outflow) / inflow from operating activities	(494,613)	2,697,443
<b>Investing activities</b>		
Additions to property, plant and equipment	(769,631)	(6,006,701)
Decrease in investments	(1,430,951)	2,433,931
Net cash inflow / (outflow) from investing activities	(661,320)	(3,572,770)
<b>Net movement in cash and cash equivalents</b>	166,707	(875,327)
<b>Change in cash and cash equivalents</b>		
Balance at beginning of the year	710,359	1,585,686
Net movement	166,707	(875,327)
<b>Balance at end of the year</b>	<b>877,067</b>	<b>710,359</b>
<b>The balance comprises:</b>		
Cash at bank	821,092	668,759
Cash on hand	55,975	41,600
<b>Total</b>	<b>877,067</b>	<b>710,359</b>

#### NOTE A

Reconciliation of (deficit)/surplus for the year to cash (utilised by) / generated from operations.

	2015 N\$	2014 N\$
<b>(Deficit) / Surplus for the year</b>	<b>(522,616)</b>	<b>4,162,589</b>
Adjusted for:		
• Depreciation	182,150	196,826
• Interest received	(70,073)	(106,993)
<b>Operating (deficit) / surplus before working capital charges</b>	<b>(410,539)</b>	<b>4,252,422</b>
Working capital changes:		
• Decrease / (increase) in receivables	102,369	(1,434,180)
• (Increase) in inventories	(273,429)	(215,133)
• Increase / (Decrease) in payables	16,914	(12,659)
<b>Cash (utilised by) operations</b>	<b>(564,685)</b>	<b>2,590,450</b>

\*Note: The represented figures are an excerpt from the audited financial statements for the year ended February 2015.



# The AfriCat Foundation Trust

Registration Number T48/93

## Statement of Financial Position as at 29 February 2016

	2016 N\$	2015 N\$
<b>ASSETS</b>		
<b>Non-current assets</b>	12,508,630	11,414,876
Property, plant and equipment	11,445,062	10,593,349
Investments	1,063,568	824,527
<b>Current assets</b>	2,197,814	2,808,117
Receivables	661,304	1,442,488
Inventory on hand (curios)	688,163	488,562
Cash and cash equivalents	848,347	877,067
<b>Total Assets</b>	<b>14,706,444</b>	<b>14,225,993</b>
<b>FUNDS AND LIABILITIES</b>		
<b>FUNDS</b>	14,656,062	14,155,993
Opening balance	14,155,993	14,678,609
(Deficit) / Surplus for the year	500,069	(522,616)
<b>Non-current liabilities</b>	50,382	70,000
<b>TOTAL FUNDS AND LIABILITIES</b>	<b>14,706,444</b>	<b>14,225,993</b>

# The AfriCat Foundation Trust

## Statement of Comprehensive Income for the Year Ended 29 February 2016

	2016 N\$	2015 N\$
<b>Income</b>	<b>7,449,378</b>	<b>5,100,308</b>
Donations	4,192,467	2,781,559
Adoptions	648,206	491,843
Curios	2,042,122	1,496,833
Day Centre activities	2,61,303	-
Filming fees	24,384	-
Okonjima	-	20,000
Interest received	40,932	70,073
Rent received	240,000	240,000
<b>Expenditure</b>	<b>6,949,309</b>	<b>5,622,924</b>
Project activity expenditure	2,243,334	1,819,908
Operational expenditure	4,705,975	3,803,015
<b>Surplus / (Deficit) for the year</b>	<b>500,069</b>	<b>(522,616)</b>



# The AfriCat Foundation Trust

## Statement of Cash Flows for the Year Ended 29 February 2016

	2016 N\$	2015 N\$
<b>Operating activities</b>		
Cash receipts from donors	7,408,446	5,030,234
Cash paid to suppliers for services	(5,997,225)	(5,594,920)
Cash generated from / (utilised by) operations	1,411,221	(564,686)
Interest received	40,932	70,073
Net cash inflow / (outflow) from operating activities	1,452,153	(494,613)
<b>Investing activities</b>		
Additions to property, plant and equipment	(1,241,833)	(769,631)
(increase) / Decrease in investments	(239,041)	1,430,951
Net cash (outflow) / inflow from investing activities	(1,480,874)	661,320
<b>Net movement in cash and cash equivalents</b>	<b>(28,721)</b>	<b>166,707</b>
<b>Change in cash and cash equivalents</b>		
Balance at beginning of the year	877,067	710,359
Net movement	(28,721)	166,707
<b>Balance at end of the year</b>	<b>848,347</b>	<b>877,067</b>
<b>The balance comprises:</b>		
Cash at bank	763,417	821,092
Cash on hand	84,930	55,975
<b>Total</b>	<b>848,347</b>	<b>877,067</b>

#### NOTE A

Reconciliation of surplus / (deficit) for the year to cash generated from / (utilised by) operations.

	2016 N\$	2015 N\$
<b>Surplus / (Deficit) for the year</b>	<b>500,069</b>	<b>(522,616)</b>
Adjusted for:		
• Depreciation	390,120	182,150
• Interest received	(40,932)	(70,073)
<b>Operating surplus / (deficit) before working capital charges</b>	<b>849,257</b>	<b>(410,539)</b>
Working capital changes:		
• Decrease in receivables	781,184	102,369
• (Increase) in inventories	(199,601)	(273,429)
• (Decrease) / Increase in payables	(19,619)	16,914
<b>Cash generated from / (utilised by) operations</b>	<b>1,411,221</b>	<b>(564,686)</b>

\*Note: The represented figures are an excerpt from the audited financial statements for the year ended February 2016.