2016 Annual Progress Report

Reporting Period

January-December 2016

By
Dr Laurie Marker
Executive Director
Cheetah Conservation Fund

P.O. Box 1755
Otjiwarongo, Namibia
Phone: 067 306225
Fax: 067 306247
Email: cheetah@iway.na

I. Executive Summary

Our cheetah re-wildling programme continues with much success, and this year we saw the birth of a second generation of re-wilded cheetahs from Jacomina, a cheetah released at the Erindi Private Game Reserve in 2013. Her two female offspring, as well as one adult male, continue to thrive at Erindi. Our release programme is an invaluable tool for potential re-introductions into other current and former cheetah range areas. Similarly, our research in other areas such as cheetah genetics, health, reproduction, and ecology, continues its momentum with numerous scientific papers or posters published or in the making. Much of our research work, along with our educational programmes, is largely possible thanks to the support of our volunteers and the dedication of our student interns. The free Carnivore Tracker app launched last year, now includes reports of 697 sightings on 28 of the 33 carnivores that inhabit Namibia.

In Namibia, as in most of the cheetah range, the future of the species is in the hands of people who must share their land with this apex predator. Thus, our work places great emphasis on economic development initiatives aimed at improving the livelihoods of Namibian livestock farmers and the community in general. The CCF's Dancing Goat Creamery's focus on quality and customer satisfaction resulted in continued profit growth. The Creamery, along with CCF's Chewbaaka Memorial Garden, Vineyard, and Apiary, encourage businesses not commonly practised in Namibia, such as goat milk products, organic vegetables/greens, wine and honey. Our eco-tourism business saw a 36% growth in number of visitors and a 35% growth in terms of income. Our flagship programme, Bushblok, once again passed its Forest Stewardship Council (FSC) ™ annual inspection, and saw continued improvements to its facility.

Implementation of programmes aimed at economic development, integrated livestock and wildlife management, and habitat restoration in the Greater Waterberg Landscape (GWL) continued during this period with consultative meetings and workshops on bush biomass harvesting, craft making, and tourism for members of four conservancies. A key factor for success is CCF's ability to maintain full-time staff and mentors in four GWL conservancies, to continue with its Future Famers of Africa training. On the Education front, we continued to visit schools and welcome groups at the CCF Centre, having reached nearly 10,000 learners and students this year.

One of our most important programmes designed to mitigate human-wildlife conflict, CCF's Livestock Guarding Dogs (LGD), continues to be in high demand by livestock farmers who understand the need to maintain healthy eco-systems. Over the years, our guarding dog programme has been adopted by Cheetah Conservation Botswana, Cheetah OutReach (South Africa) and, the Ruaha Carnivore Project (Tanzania). Since the programme's inception in 1994, nearly 550 dogs have been placed throughout Namibia, Tanzania and South Africa. An integral part of CCF's LGD programme, the CCF Model Farm, serves as a real-life example of how an integrated approach to managing livestock and wildlife makes it possible for people and eco-systems to live in harmony. During this period, the number of goat and sheep herds closed at 450 individuals, and 455 heads of cattle.

This past year was particularly important for the cheetah, as their illegal trafficking for the pet trade continues to threaten wild populations across most of the cheetah's range. However, since 2013, the issue has been dealt with at the highest level: the Convention on International Trade of Endangered Species, or CITES. CCF, along with 13 countries and eight NGOs, worked together to issue a set of recommendations that was approved at the 66th CITES Standing Committee meeting in January 2016, with additional decisions adopted at the 17th Conference of the Parties (CoP17) held in September 2016.

We are excited to have the cheetah being part of this important international effort, which saw an additional boost with the publication of '*The global decline of cheetah Acinonyx jubatus and what it means for conservation*,' a major study co-authored by CCF. The study, published in late December, received major media attention worldwide bringing more awareness to the plight of the cheetah and the important work of CCF.

Effective fundraising is essential to keep our programmes alive, and my international travels are an important part of CCF's fundraising efforts. My tours during 2016 covered 44 cities in 20 U.S. states, and included lectures at prestigious universities, zoos and other institutions. I also toured Australia for the first time with our newly-formed CCF Australia, and returned to Italy, Germany and the UK for lectures and strategic meetings with our CCF international partners.

Saving a species like the cheetah is not much different than saving the world. By maintaining the health of keystone species, whole eco-systems can remain sustainable. It is a titanic task, and it can only be done by raising awareness, utilising solid science, and encouraging collaborations. We, humans, have the intelligence and the resources to ensure that our planet does not suffer irreparable damage. We can do this if we work together. The time is now!

Laurie Marker, DPhil.
Founder and Executive Director

II. Organisational Structure

The Cheetah Conservation Fund (CCF) is an international organisation with registered not-for-profit organisations in Namibia, the United States, Canada, the United Kingdom, Australia and the newly formed CCF Italy. A new CCF foundation is being incorporated in China. In addition, CCF has Memoranda of Understanding with partner fundraising organisations in the Netherlands, France, and Germany.

CCF's International Research and Education Centre in Namibia is the primary base for all of CCF's global activities. In 1991 CCF became a Namibian Voluntary Trust and in 2002 was registered as a not-for-profit Namibian Section 21 Company. CCF's Namibian Board of Directors is comprised of leaders in the local community, businesses, and agricultural sectors. Additionally, there is an International Scientific Board of Advisors that assists in planning and advising on research projects. CCF's Executive Director, Dr Laurie Marker, is assisted in the management and operations of CCF by a core professional staff aided by short-term volunteers and students who assist with daily operations and data collection.

The CCF Centre includes the farms Elandsvreugde, Osonanga, Boskop (Khayam's Kopje), Cheetah View, Bellebenno, Janhelpman, and Bynadaar, totalling 46,000 hectares. CCF's Centre is located in prime cheetah habitat and a wildlife-friendly area, with many neighbouring farmers who believe in conservation ethics. This ensures a large prey population, which is important for the cheetah population and serves to provide a model for farmers to demonstrate that they can live harmoniously with cheetahs.

CCF is an active member of the Waterberg Conservancy, which encompasses over 175,000 hectares of private farmland surrounding the Waterberg Plateau Park: a national game park dedicated to rare and endangered species. The conservancy's farmers cooperatively manage the land's wildlife for long-term sustainability that in turn provides habitat and prey base for the cheetah. CCF also sits on the Steering Committee of the Greater Waterberg Landscape, an area comprising 16,000 km^2, or close to 2 million hectares, around the Plateau and in Hereroland.

III. Research

During 2016, CCF continued working towards achieving its research objectives and strengthening collaborative efforts. Research continued in overall health and genetics, surveying, release of cheetah, and ecosystem research.

A. Population Dynamics

As of December 2016, the number of CCF's resident captive cheetahs has increased to 39 (22M, 17F), compared to 33 (15M, 18F) at the end of 2015.

Throughout 2016, there were no releases. Four females were transferred out on loan to Kiripotib Guest Lodge and four males returned to CCF from the same location. Three of CCF's resident cheetahs (1M,2F) were euthanized during this period: one male, age 16.5, was euthanized on 30 April 2016 due to renal failure, one female, age 14, was euthanized on 20 June 2016 due to old age and organ failure and a female, age 13, was euthanized on 8 August due to organ failure (see section B.7 below).

Nine wild cheetahs (4M,5F) were added in 2016. In February, a wild-caught male with an injury (broken bones) to his front left leg and deemed non-releasable. In August, a total of eight wild cheetah cubs (3M,5F) were brought in. Five cubs (1M,4F) came to CCF on 22 August after their mother was shot. The other three cubs (2M,1F) were removed from the wild on CCF land after their mother was killed by a leopard. Initially, the two litters were kept separate at our quarantine pens, but were separated by sex in November to allow them to bond. This is particularly important for the males, who we are hoping will form a coalition for when they will eventually be released. As of December, both groups, males and females, remain in quarantine pens.

B. Examinations & Procedures

Every cheetah that is evaluated under anaesthesia by CCF is assessed for general health and fitness. The examinations follow standard protocols. Male examinations include semen collection when possible; the semen is analysed and stored in the CCF Genome Resource Bank (GRB).

In 2016, CCF performed a total of 30 examinations and procedures on 27 individual cheetahs (9M, 18F). Exams were performed on six captive individuals (4F, 2M) and 21 captive-released or wild individuals (7M, 14F) (Table 1).

Table 1: Summary of examinations and procedures performed by CCF on captive, captive-released, and wild cheetahs in 2016. The examination or procedure classification is indicated and includes the following: predator (wild or captive-released cheetah in field); entry (arrival of wild or captive cheetah from another facility or location to CCF); annual (routine captive cheetah health check); EEJ (electro-ejaculation); dental; and medical (treatment of any injury or illness, not including dentistry & oral surgery).

AJU	Sex	Date	Exam or Procedure						Details
			Predator	Entry	Annual	EEJ	Dental	Medical	
1648	F	6-Feb-16	x				x		Collar change
1649	F	6-Feb-16	x				x		Collar change
1654	M	25-Feb-16	x		x	x	x	x	Caught on farm
1518	M	3-Mar-16			x			x	Placed, health deterioration

1518	M	14-Mar-16					x	Chronic renal failure
1654	M	17-Mar-16					x	Follow up Rx and wound assessment
1269	M	30-Apr-16					x	Health deterioration, subsequent euthanasia
1578	F	24-Apr-16					x	Health check prior to placement
1619	F	1-May-16					x	Re-collaring + eye exam
1655	F	20-May-16		x				Shandy cub work up, sample collection
1656	F	20-May-16		x				Shandy cub work up, sample collection
1657	M	20-May-16		x				Shandy cub work up, sample collection
1658	F	20-May-16		x				Shandy cub work up, sample collection
1380	F	27-May-16					x	Work up, health deterioration
1237	F	12-Jun-16					x	Work up, eye swelling and discharge
1355	F	20-Jun-16					x	Euthanasia
1380	F	8-Aug-16					x	Health deterioration, elected euthanasia
1664	M	15-Aug-16	x			x	x	Entry medical exam and sample collection
1665	M	15-Aug-16	x			x	x	Entry medical exam and sample collection
1666	F	15-Aug-16	x			x	x	Entry medical exam and sample collection
1667	F	22-Aug-16	x			x	x	Entry medical exam and sample collection
1668	M	22-Aug-16	x			x	x	Entry medical exam and sample collection
1669	F	22-Aug-16	x			x	x	Entry medical exam and sample collection
1670	F	22-Aug-16	x			x	x	Entry medical exam and sample collection
1671	F	22-Aug-16	x			x	x	Entry medical exam and sample collection
1732	M	2-Sep-16	x			x	x	Work up, data and sample collection
1733	F	29-Oct-16				x	x	Work up, data and sample collection
1734	F	29-Oct-16				x	x	Work up, data and sample collection
1735	F	29-Oct-16				x	x	Work up, data and sample collection
1747	M	27-Nov-16					x	Medical exam and radiography

1. Annual Physical Examinations: Captive Cheetahs

In 2016, CCF ceased to conduct annual physical examinations and only performed health-related medical procedures under anaesthesia on an individual/group basis when deemed necessary. During each event, thorough physical examination, appropriate sample collections (blood, urine, hair, faeces, ectoparasites), appropriate medications, vaccine boosters (Fel-O-Vax®, Rabisin®) and ectoparasiticides (Frontline®) were administered (see below).

2. Health-Related Medical Procedures: Captive Cheetahs

In 2016, CCF conducted a total of six medical examinations on four individual captive cheetahs (3F, 1M) (Table 1).

Resident male cheetah AJU 1518 (Mendel) was previously placed at Guest Farm Kiripotib and brought to CCF after complaints of inappetence, lethargy and declining condition. He was anaesthetised on the 3 March 2016 for medical examination and sample collection. Fluids were administered to correct dehydration and broad-spectrum antibiotics and steroids given. Pathology results indicated renal disease, and so regular fluid therapy was commenced. Follow-up medical examination was conducted on 14 March 2016 to assess kidney function that indicated improved status.

Resident female cheetah AJU 1578 (Bella) was anaesthetised on 24 April 2016 for a health check prior to re-location to Guest Farm Kiripotib. No abnormalities were detected.

Resident female cheetah AJU 1380 (Samantha) was anaesthetised on 27 May 2016 after three days of inappetence, polyuria/polydipsia, lethargy and depression. Fluids were administered via IV and SC routes, and long-acting antibiotics and steroids were administered. Blood and urinalysis revealed kidney disease, which was treated with multiple antibiotic courses and weekly fluid therapy. Samantha was anaesthetised again on 8 August 2016 after concerns of deteriorating health and was subsequently euthanized due to renal failure refractory to treatment.

Resident female AJU 1237 (Nina) was anaesthetised on 12 June 2016 for an eye examination and health check after it was noted her left eye was markedly swollen. In addition, she had bilateral mucoid discharge draining from both nostrils. Examination of the oral cavity revealed perforation of palatine erosion on the right side that communicated with the frontal sinus. During the workup, she was administered long-acting antibiotics, corticosteroids and non-steroidals. She was subsequently placed on a course of prednisolone and doxycycline and recovered uneventfully.

3. Captive-Released Cheetah Examinations

In 2016, CCF did not release any cheetahs, but conducted one examination and re-collaring on a captive-released female cheetah AJU 1619 (Zinzi), who was originally returned to the wild on 18 June 2014.

Zinzi was darted on 1 May 2016 on a nearby lodge, Aloe Grove, in order to replace her faulty VHF tracking collar. She was successfully darted on initial attempt but required supplemental and maintenance doses to allow sufficient examination of her left eye, which had sustained some traumatic event resulting in a deep corneal ulcer. She was later darted on three separate occasions with long acting antibiotic (Convenia®) for her eye condition.

4. Wild Cheetah Examinations

In 2016, CCF conducted a total of 24 wild cheetah exams on 22 individual cheetahs (13F, 9M) (Table 1).

Wild adult male cheetah AJU 1654 (Merlin) was captured by a farmer 35km south of Outjo, on a property located in the Paresis Mountains. He had a pre-existing injury on the left leg that compromised his ability to remain in the wild. He was transported to CCF on 25 February 2016 and anaesthetised for full entry exams using the annual physical exam protocol; semen collection was attempted by electro-ejaculation. He had multiple wounds over his left rump, digits and most notably over his left carpus. Radiographs of the joint revealed significant chronic and degenerative bone changes, explaining the visible malformation and lameness. He was later dewormed, vaccinated and administered antibiotics prior to being placed in the CCF quarantine area. Additional anaesthesia was performed on 17 March 2016 for follow-up examination and radiographic assessment of the left carpal joint where no further deterioration was detected and due to improved mobility, no further action ensued.

On 20 May 2016, four cubs (1M,3F) of re-wilded female Shandy's cubs were located within Erindi Private Game Reserve and given field examinations without anaesthesia. The four cubs (AJU 1655, 1656, 1657,1658) (Table 1) were estimated to be approximately four weeks' old. General medical checks were performed and samples/measurements obtained. The cubs were subsequently returned to their nesting site.

After the fatality of Zinzi on 12 August 2016, her three cubs (2M,1F) were captured and brought to CCF to be held until they are old enough for release. The cubs are approximately 11 months' old. On 15 August, they were anaesthetised for work ups and medical screenings, and where administered vaccinations and parasite treatment. One of the males was treated for superficial wounds due to cage trauma.

In July 2016, five cheetah cubs were caught on a nearby farm after their mother was shot for killing livestock. Subsequently, on 26 July, CCF picked up the group to be held on site. Medical work ups were conducted on all five cubs on 22 August 2016, during which measurement data and samples were collected. All cats were vaccinated and determined to be in good health.

Wild adult male cheetah AJU 1732 (Eli) was caught on 1 September 2016 for data collection and collar placement for research purposes in the study of movement patterns of solitary individuals in the area. He was given a full medical check on 2 September 2016 and was subsequently released on the same day along the CCF airstrip.

On 29 October 2016, three cheetahs (3F: one adult and two cubs) were transported from Outjo district after being caught on a farm. Work ups were subsequently conducted upon arrival. The adult female had sustained cage trauma wounds and was administered fluids for dehydration. Both cubs were found to be in good health. All three were vaccinated against rabies and measured. Mother and cubs were released and re-united in a solitary pen, from where they were released on CCF land four days later.

Male cheetah AJU 1747 (Starsky) arrived from Africat, Okonjima on 27 November 2016. That morning he had been observed with sustained wounds over his right shoulder and was recumbent. He was brought to CCF for medical work up and radiography, as there were concerns that a fracture had occurred. On exam, the cat was significantly dehydrated, no fractures were evident and the necrotic wound was cleaned, debrided and stitched closed with fluids administered both intravenous and subcutaneously. The appearance of the wound suggested the trauma had occurred days prior, as there was significant necrosis and large infestation of fly larvae within the wound. A concern of sepsis was evident and the cheetah was taken back with guarded prognosis. Sadly, Starsky died three days later despite intensive care and monitoring (see 6.). A necropsy was performed at CCF.

5. Dental Procedures on Wild and Captive Cheetahs

In 2016, no dental procedures were conducted on Wild and Captive cheetahs.

6. Cheetah Deaths, Euthanasias, and Necropsies

In 2016, CCF conducted a total of five cheetah necropsies (2M, 3F).

Resident male cheetah AJU 1269 (Merlot) was euthanized on 30 April 2016 due to failing health. The necropsy was performed on 5 May 2016 with the following findings: advanced dental disease, muscle wastage, firm and shrunken kidneys bilaterally that were evidence of chronic kidney disease (later confirmed through bloodwork) and hepatomegaly.

Resident female cheetah AJU 1355 (Rosy) was euthanized on 20 Jun 2016 due to pre-existing renal failure and newly developed sporadic neurological episodes (seizure-like activity). Her state and exhibiting clinical signs prior to euthanasia (central blindness, syncope/seizure type episodes) highly suggested the presence of a leukoencephalomyelopathy, although yet to be confirmed. The findings of the necropsy performed on 21 June 2016 revealed advanced dental disease, focal areas of

discoloration of various size throughout the lungs, jet lesions in cranial and caudal venae cavae together with nodulation of the left AV valve and decreased distinction between cortex and medulla of both kidneys.

Resident female cheetah AJU 1380 (Samantha) was euthanized on the 8 August 2016 due to progressive renal failure. She had been maintained on regular fluid therapy after being diagnosed five months prior. The necropsy, performed on the same day, revealed emphysema of nodulation of the right cranial and middle lung lobes, and abnormal appearance of both kidneys (lumpy, thickened capsule and thickened cortex)

Released collared female, AJU 1619 (Zinzi) was found death on 12 August 2016 after CCF received tracking updates suggesting a mortality event. On gross inspection, she was found with significant wounds that strongly indicate the cause of death to be due to a leopard attack. Musculature over the left hindquarters was removed completely, leaving the exposure of bone and caudal abdominal contents. Wounds were located over the front left shoulder with bite marks sustained over the neck. Other noted findings on necropsy were emphysema of the left cranial lung lobe and tapeworms within the gastrointestinal tract. She was otherwise in good condition and able to provide for her cubs as well as for herself.

A necropsy was performed on AJU 1747 (Starsky) on 29 November 2016 after failing to recover from extensive wound injury despite intensive treatment. Findings are as follows; pre-existing trauma wounds located over the cranial aspect of right shoulder, forming two extensive pockets sub-dermally within underlying musculature. The wound was found to contain fibrinous necrotic debris. One additional wound over the dorsal aspect of the right thoracic vertebrae (~T8), showed significant tissue bruising underlying the skin. The right cranial lung lobe had a nodular appearance with partial atelectasis. Other areas of the lung fields were affected by this nodular pattern and haemorrhagic areas were found throughout the lungs. Other organs appeared relatively normal. High suspicion of sepsis was believed to be cause of death based on findings and clinical progression.

7. Non-Cheetah Carnivore Examinations and Necropsies

In 2016, CCF performed one non-cheetah carnivore examination and no necropsies.

On 8 August 2016, a small team from CCF was requested to examine an 18-year-old captive male leopard, located on Aloe Grove Safari Lodge. A decline in condition had been noted over the past few days, with inappetence, lethargy and hyper salivation. A medical health check and blood sample collection were performed under injectable anaesthesia. Grossly, the leopard had a poor coat condition and average body score. Prior to anaesthesia he appeared mentally dull and was hyper salivating blood stained saliva. The male was severely dehydrated and received subcutaneous fluid therapy throughout the procedure. On examination of the oral cavity there was significant ulceration of the tongue (glossitis) and mucosa (stomatitis), malodourous breath (halitosis) and severe gingivitis. Many teeth were found to be either missing or worn. He received anti-inflammatory medication, long acting antibiotics and injectable vitamins. Differential diagnoses were renal failure or virus (calicivirus, FeLV). Blood samples indicated increased white blood cell count and elevation of renal parameters. It was concluded that the cat was in late stage renal failure and was subsequently euthanized.

C. Health and Reproduction

1. Genome Resource Bank

CCF continues to bank sperm, serum, plasma, white and red blood cells, hair, and skin samples on all cheetahs worked up. Additionally, an increasingly extensive scat sample collection from wild cheetahs in Namibia and neighbouring countries is kept at CCF. All samples are part of CCF's Genome Resource Bank (GRB). Since 1991, blood and tissue samples have been obtained from over 900 individual cheetahs. These samples are used for over-all health and genetic purposes, with backups stored at both CCF Namibia and the Smithsonian Institution in the USA. With the creation of CCF's genetics laboratory, most samples are now held at CCF. Currently CCF holds the world's largest wild cheetah database of biological material, which also creates the need to curate all the samples and the development of database management systems.

Since 2002 CCF has been collecting, evaluating, and freezing cheetah sperm. The CCF GRB contains a total of 497 cryo-preserved sperm samples from captive and wild cheetahs in Namibia, representing 104 individual cheetahs. Between January and December 2016, no new collections were added to the CCF GRB.

D. Conservation Genetics

The Life Technologies Conservation Genetics Laboratory was set up in 2008/2009 by Dr Anne Schmidt-Küntzel for CCF, thanks to the generous support of Life Technologies Inc. (formerly Applied Biosystems, today Thermo Fisher Scientific) and the Ohrstrom Foundation. The most important addition to the CCF genetics laboratory was the donation and installation of a refurbished 4-capillary genetic analyser in July 2014 by Thermo Fisher Scientific. The new instrument has greatly increased the capacity of the laboratory. The new laboratory spaces inaugurated in 2015 were designed with forensic laboratory standards and is larger to be able to host visiting scientists.

The laboratory's main aim is to contribute to the on-going research and conservation of cheetahs by working together with the ecology and biomedical departments in CCF's cross-disciplinary mode of operation. The Scat Detection Dog programme is part of this approach and was put into place to provide the necessary samples to the various genetics projects. The main genetics projects are related to cheetah population structure, census, relatedness, and assignment of individual ID to non-invasive samples such as scat. Projects related to other species are performed with outside funding and are so far limited to collaborative projects.

Since 2013, Dr Schmidt-Küntzel has worked closely with a database expert in the U.S. on an interactive electronic laboratory notebook. During the second half of 2016, all extraction entries on cheetah blood and tissue samples have been finalised and PCR entries are currently being trialled.

After over four years of excellent work at the genetics laboratory first as intern, then Master's student, then Laboratory Technician and Research Assistant, Lucia Mhuulu left at the end of April 2016 to move back to her family. Mbawemi Gabriella Mulikita, a Zambian graduate who performed a 3-month internship in 2014, returned to the laboratory as short term staff in January 2015. She left the laboratory to go to medical school end of June 2016. Katrin Hils joined the laboratory in June 2015 and ensured the good functioning of the laboratory until the end of December 2016, when she left to start her PhD. A new Laboratory Manager, Dr Christoff Erasmus, joined the laboratory in mid-December to take over Katrin Hils' position.

In 2016, the laboratory hosted seven interns: Rudo Matavire, a student from Zimbabwe, finished a 5-month internship in the genetics laboratory in January 2016. Julia Kagogo and Martha Hatutale, two recent graduates from the University of Namibia (UNAM), joined the laboratory from April and June, respectively until the end of August 2016. Julia will come back as a master's student in January 2017. In September 2016, two graduates from UNAM, Anisa Maponga (Zimbabwe), and Nali Ndjene were welcomed in our laboratory for a 3-month internship. Beginning of December 2016, two 4th-year students from UNAM, Margareta Nangula and Mukelabai Muyoba, joined the laboratory as part of their official university rotation; the students will receive credit for the internship.

In February 2016, CCF collaborator Action for Cheetahs in Kenya sent two graduate students, Cynthia Nyunja and Noreen Mutoro (Master's and PhD students at the University of Nairobi, respectively), for four weeks to the CCF genetics laboratory to learn methods such as scat extraction and PCR. In the second half of 2016, the students applied their knowledge to start the work in Kenya, with guidance from Dr Schmidt-Küntzel.

Dr Ezekiel Fabiano, who graduated from his PhD in genetics with CCF in 2013 brought two batches of Angolan carnivore faecal samples to CCF so they can be analysed at the genetics laboratory as part of an ongoing collaboration. Dr Fabiano visited the laboratory with eight students for five days in August 2016. The students received training on laboratory procedures and interpretation of sequences and genotypes.

In February 2016, graduate student Kristine Teichman came with caracal hair and tissue samples to the genetics laboratory for 1.5 weeks. During this time, Kristine was trained on the basics of genetic laboratory work and all samples were extracted. The laboratory work and analysis will be finalised by the CCF genetics laboratory staff.

In July 2016, Dr Tamara Schenekar joined the laboratory as a visiting researcher for seven months and helped with ongoing projects and assisted with the database.

In mid-September 2016, Dr Munro Marx, Managing Director of Unistel Medical Laboratories (Pty) Ltd, visited the genetics laboratory for two days. The purpose of his visit was to discuss an international collaboration on genetic services for game and livestock species. The collaboration with Unistel is the first step towards setting up a service laboratory at CCF. The CCF genetics laboratory is also in the process of setting up services for bird sexing in Namibia.

Genetics Projects

- **Cheetah genotypes of known individuals (blood/tissue samples):** As part of CCF's on-going research at the genetics laboratory, DNA is extracted from all individuals of which blood and tissue samples are available and their genotypes are obtained. All extracted DNA samples were assessed for quality via gel electrophoresis and extraction information was entered into the new database system. The samples were genotyped for 15 microsatellite markers and a sex marker. A reference manuscript to document the markers is in preparation. An additional set of 15 markers were tested in 2016. Once new protocols (multiplexes) are established for the new markers, they will be used to extend the genotypes of the existing sample collection, and this data will be used to answer various population genetic questions.

- **Population study of cheetahs on CCF property using non-invasive techniques:** Individual cheetahs are assigned a genetic ID as well as a visual ID through the combination of genotyping of the DNA obtained from the scat samples and the photographs obtained from CCF's camera trap study. The data from 2008-2014 is part of Lucia Mhuulu's MSc research thesis, which she

defended in June 2015. A publication is in preparation. Many of these scat samples were collected with the help of the scat dogs Finn, Isha, and Tiger.

The scat sample collection from a coalition of two wild cheetah males ('the wild boys': Hifi, AJU 1543, and Sam, AJU 1542), which had been collected daily around the CCF Centre between July 2008 and October 2013, comprises over 950 samples and is an invaluable resource for long-term monitoring of physiological parameters in two wild cheetahs. While the two wild males have died since (AJU 1542 in August 2010, AJU 1543 in October 2013), the work on the samples continues. The parasite levels were assessed and recorded on a regular basis at the time of collection and over 200 samples have been extracted, 135 of which were identified genetically. The aim of the study is to identify samples for every 3-5 days throughout the entire five-year period and conducted hair analysis to determine the wild males' diet over time. Hormone work to determine stress and testosterone levels will be performed when funding is secured.

- **Namibia-wide population genetic study**: Samples are processed once they are collected by the CCF ecology and scat detection dog teams. Some samples are also obtained from collaborators from other conservation organisations and taxidermists. Mbawemi Gabriella Mulikita processed a set of 50 samples during her internship and identified the cheetahs in that sample collection. She then generated an extended genotype for one sample per individual and assessed the animals' diet microscopically from an imprint she made from prey hair found in the faeces using a CCF protocol.

- **Verification of the accuracy of the scat detection dogs**: The species of the scat samples found by the dogs is routinely verified using molecular markers.

- **Illegal trade**: The species content of samples from illegal trade was assessed using molecular markers specifically designed to identify carnivore species in samples of poor quality. PCR products were taken to the United States by Dr Schmidt-Küntzel to do next generation sequencing in a collaborator's laboratory. The obtained results will be made public when possible.

- **Babesia**: A trial study was conducted in order to determine the percentage of affected cheetahs that are currently at CCF and compare those to the results obtained from microscopic evaluation of blood smears from other captive cheetahs. We also developed a diagnostic test to be used for further screening of the samples. The initial testing was assigned to Shalette Dingle, a visiting Cornell veterinary student in 2013; since then, a more sensitive test was also tested with promising results. Veterinary student intern Natasja Lavin read the blood slides corresponding to the genetic samples. In March 2016, Karen Holm, veterinarian and working guest, finalised the last samples for the existing data set.

- **Release study**: Sixty-six release and pre-release scat samples were extracted and assigned to an individual cheetah. These samples were sent to the Smithsonian Institution in the US to be analysed for faecal hormone levels.

- **Carnivore species ID and diet**: In 2014, visiting student intern Alicia Walsh from University of New Hampshire (USA) extracted DNA from 50 carnivore scat samples and verified the species they belong to using a mitochondrial marker. She also identified what the animals ate by using a variety of approaches including hair, bone, exoskeleton, and vegetation analysis. She published the project in the university's Inquiry journal. A preliminary analysis of the diet composition was performed by ecology research assistant Samara Moreira.

Collaborative Genetics Projects

- **Oxalate nephrosis**: A collaboration was started in March 2012 with Dr Karen Terio from the University of Illinois (USA) and Dr Emily Lane from the National Zoological Gardens of South Africa for a study on oxalate nephrosis. Primers for one candidate gene were designed by Dr Schmidt-Küntzel and optimised at the CCF genetics laboratory in 2014. Diseased individuals were tested in the laboratory of the South African collaborators. In the first half of 2015 a second gene was investigated. The South African team came to visit CCF in 2015 as part of the collaboration; and two students from each institution visited the other one as part of the grant. To date no candidate mutation was found.

- **Amyloidosis**: In September 2013, a PhD student from the Smithsonian Institution, Ashley Franklin, came to CCF to make use of our unique sample collection of captive and wild cheetahs to determine their amyloidosis status. Ashley did the genetic work at the CCF genetics laboratory and took matching scat samples back to the United States to do hormone work and determine amyloid levels. Ashley graduated in 2014 and the study was presented at the North American Congress of Conservation Biology in July 2014. The genetic association was published in the Journal of Heredity in March 2016.

- **Gene expression**: Collaboration began in early 2011 with Dr Erold Naomab, head of the Department of Chemistry and Biochemistry at UNAM for a study on gene expression in the cheetah. New sets of samples were collected in 2014.

- **Illegal trade**: The collaboration with cheetah holding facilities and veterinary clinics in the UAE was initiated during a trip in June of 2013 and renewed in February of 2014. The aim is to begin developing a genetic database of cheetahs held in that area. Sperm and genetic samples were collected on males in 2014. The genetic samples are currently being analysed.

- **Carnivore ID**: Carnivore hair samples obtained from rubbing stations and hair snares in southern Namibia were analysed at the genetics laboratory to identify the species. This work was done in collaboration with the Brown Hyena Project in Lüderitz and will be part of Sarah Edward's PhD. The genetic analysis was finalised in 2014, and the PhD successfully defended in October 2015. A publication is expected in 2017.

- **Caracal ID**: DNA from Caracal hair and tissue samples, collected from killer traps in South Africa, were extracted and genotyped at the genetics laboratory to assess relatedness. This study is a collaboration with Kristine Teichman (PhD student from British Columbia University, Canada) and will be part of her PhD.

- **Rhinoceros**: A pedigree for white rhinoceros (*Ceratotherium simum*), performed by visiting researcher and Master's student Abigail Guerier from Ongava Wildlife Reserve's Research Centre, was finalised and published in 2012. Abigail graduated with a Master's degree in September 2012. In the beginning of 2013 she started a genetics project on Ongava's resident population of black rhinoceros (*Diceros bicornis*) at the CCF genetics laboratory. The project is on-going and more samples are added as they are collected by the Ongava research team.

- **Termites**: In May 2015 and February 2016, a research team from the University of Florida (US) worked with CCF to do a pilot study on termites. The initial tests were successful. More research is planned for upcoming years.

- **Soil flora**: as part of a collaboration with Dr Jeffrey Buyer (US Dept. of Agriculture), the flora of soil obtained from CCF research areas where bush was harvested at different time points was

compared to each other to assess the impact of bush harvesting on the soil flora. A preliminary study was published in January 2016.

- **Brown Hyena Project**: As part of a collaboration with Dr Ingrid Wiesel from the Brown Hyena Project in Lüderitz, we received a set of paste marks of brown hyenas in August 2016. The DNA was successfully extracted. Specific markers will be ordered to genotype individuals in the brown hyena population. These results will be part of Dr Wiesel's graduate student Inga Jänecke's PhD.

E. Scat Detection Dogs

In 2016, the scat dog team conducted a total of 185 searches (72 training, 2 demos, 1 sample check, and 110 field searches) (Figure 1).

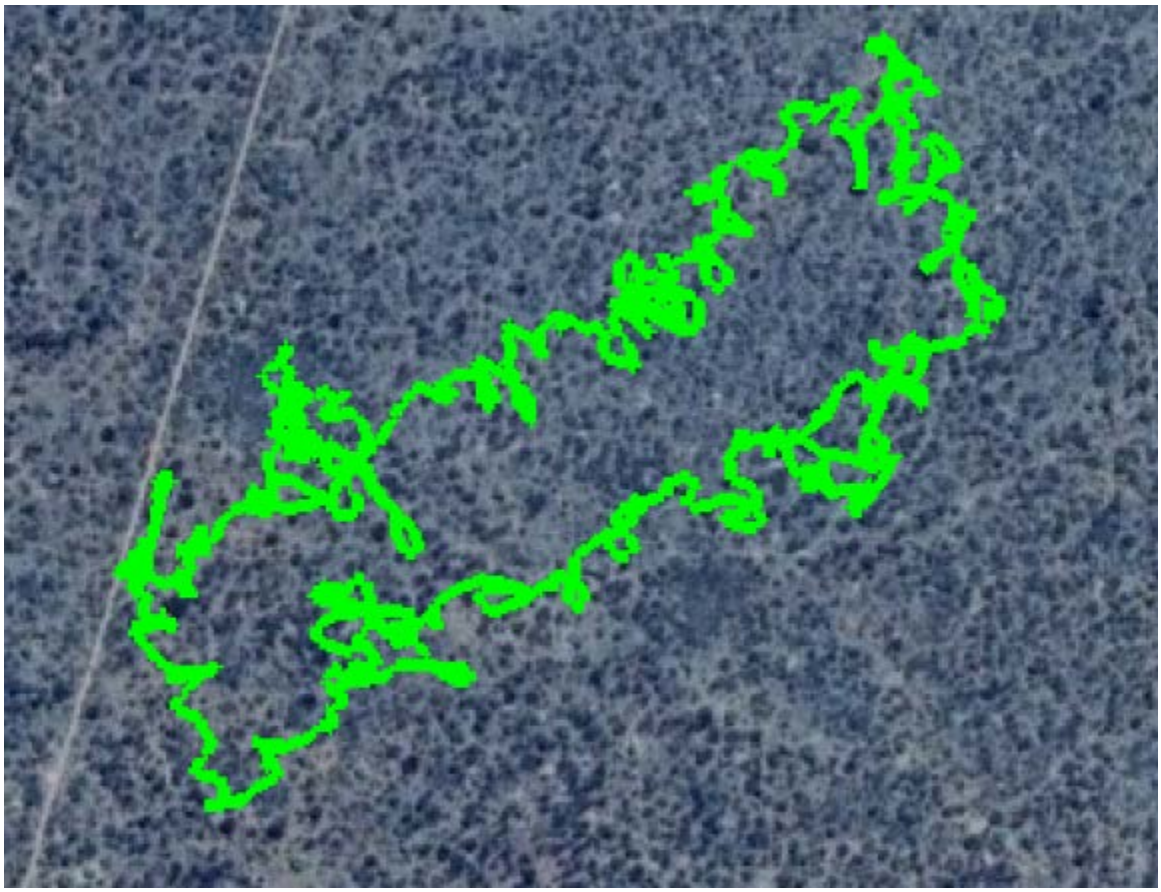

Figure 1: Screenshot of experimental 1km Rectangle Assessment Transect: green line is the path taken by dog.

Tiger was the main scat-detection dog used for the scat surveys, having indicated 287 of the total 309 collected in 2016. However, genetic analysis confirmed the suspicion that the samples included scat of other carnivore species, not just cheetah. Given Tiger's behaviour and CCF's interest in samples of all felid species, a decision was made to allow Tiger to continue to select samples from additional felid species. Allowing Tiger to search for additional species provides him with an additional incentive by successfully finding samples more frequently, since cheetah samples are very sparse due to their large home ranges, and require a lot of stamina.

Unfortunately, at the beginning of August 2016 Tiger suffered a spontaneous fracture to his front right elbow. Tiger underwent complicated surgery and his leg continues to be unstable.

Consequently, Tiger was retired from the programme, effectively putting on hold the scat-dog programme for the year.

Chris Bartos, a dog trainer and assistant curator at the Stone Zoo (US) visited CCF in December. Chris rescued, trained and donated Finn; CCF's first scat detection dog in 2009. During her visit, she assisted with training new team member Bart Balli on handling Finn and potentially re-training him for playtree searches while waiting for a new scat detection dog able to handle longer searches. Chris also facilitated the training of a new scat dog that arrived at CCF in mid-December. It is hoped that field scat searches will resume in late 2017.

F. Large Carnivore Research and Ecology

1. Cheetah Releases and Monitoring

While attempts to reach out to more farmers across Namibia continue, more than 3,000 Namibian farmers have already participated in CCF's integrated livestock and human-wildlife conflict training courses, or learned about our work through our community outreach efforts. Those farmers who are aware of CCF and our mission, contact us to seek help with their predator problems, rather than killing the predator. CCF also makes every effort to reach farmers who are unaware of the plight of predators and of the range of options available to solve human-wildlife conflict that.

To support all farmers, CCF is on available 24/7 when they call to notify about a real or perceived cheetah problem. CCF staff may assist with setting traps or retrieving cheetahs already trapped; however, this practice has greatly decreased over the past few years through education as well as government policies. CCF's policy is to not remove wild cheetah unless the cat is injured or the conflict has escalated to a point of no return. Direct contact with the farmers allow us to provide them with information about CCF's non-lethal predator management methods and attempt to train them on conflict reduction mechanisms. Since its founding in 1990, CCF has retrieved, rehabilitated and translocated over 800 cheetahs from farms across Namibia. Once at CCF, the veterinary team evaluates every cheetah's condition and determines whether it is healthy and old enough to survive in the wild again on his own. Consequently, over 600 of these cheetahs have been released back into the wild. Depending on the release location and the specific cheetahs, CCF attempts to monitor released cheetahs via VHF radio or satellite-GPS collars.

Throughout 2016, CCF continued monitoring one female released in June 2014 (Zinzi, AJU 1619), two males (Chester, AJU 1540, and Obi-Wan, AJU 1539) released in Erindi Private Game Reserve, and two female offspring (Savanna, AJU 1648, and Shandy, AJU 1649) of AJU 1510 (Jacomina) born in Erindi Private Game Reserve in April 2014. CCF is also monitoring a wild male cheetah on CCF property and adjacent properties (Eli, AJU 1732) and a wild-caught female who was released with her two cubs at CCF in September (Simone, AJU 1733).

Zinzi (AJU 1619)

Female AJU 1619 (Zinzi) was released in CCF's Bellebenno Game Camp on 17 June 2014 along with female Debra (AJU 1608). She made her first kill three days after release: a juvenile female steenbok. Over the next few years, Zinzi covered vast distances, moving across 20-30 different commercial farms. Crucially, since her release her observed kills have included steenbok, duiker, springbok, aardwolf, and warthog, all wild natural game species. Despite moving through and spending time on several livestock farms, she was never once recorded killing any small or large stock and her movements showed that she appeared to actively avoid areas with large numbers of livestock and/or human habitation.

Zinzi did incredibly well on her own, never needing support from CCF's monitoring team. She found CCF property to be suitable for her home range, and spent most of her time there, but frequently visited the farms north and northwest of CCF property.

On 12 September 2015, Zinzi gave birth to a litter of four cubs (2M, 2F). In April 2016, CCF lost contact with Zinzi due to GPS collar failure. However, on 1 May 2016 a neighbour contacted CCF notifying that he had seen two small cheetahs at one of his waterholes. CCF's monitoring team immediately went to the site and found Zinzi there. The veterinary team was mobilised and successfully darted Zinzi to replace her collar. Upon closer inspection, it was discovered that Zinzi had somehow severely damaged the collar (Figure 2) causing it to fail. She also injured her left eye, but it is not clear if the two incidents occurred at the same time.

Because of her eye injury, attempts were made to capture the cubs so that they and Zinzi could be held temporarily at CCF while she was treated. Therefore, after the collaring procedure, CCF placed Zinzi in a cage trap with other cages set around to try and capture her four cubs. However, after two and a half days, the cubs were not captured and Zinzi was released from the cage. CCF's veterinarian then decided to treat her with a long acting antibiotic. She was fed and a camera trap was placed near the food. Resulting photos confirmed that she still had all four cubs (Figure 3).

Figure 2: Zinzi's damaged collar (top) compared to the new collar (bottom).

Figure 3: Camera trap photo confirming presence of all four cubs.

In July 2016, CCF discovered that Zinzi lost one (female) of her 4 cubs. One month after this, on 12 August 2016, CCF staff found her dead on CCF's Boskop Farm. It appeared that she was killed by a leopard. CCF decided to catch the cubs as they were too young (11 months) to survive in the wild without the support of their mother. All three cubs were caught 48 hours later and put in captivity in a *boma* separated from the other centre cheetahs. The aim is to keep them until they are old enough to be released back into the wild. The two male cubs may form a coalition, which, from a genetic perspective, could be very valuable to other areas with cheetah already established. The remaining female cub may take over Zinzi's old home range or choose her own or move away completely.

Zinzi's GPS collar provided CCF with invaluable data (Figure 4) on her movements, home range, activity, prey selection, habitat preference and spatial use.

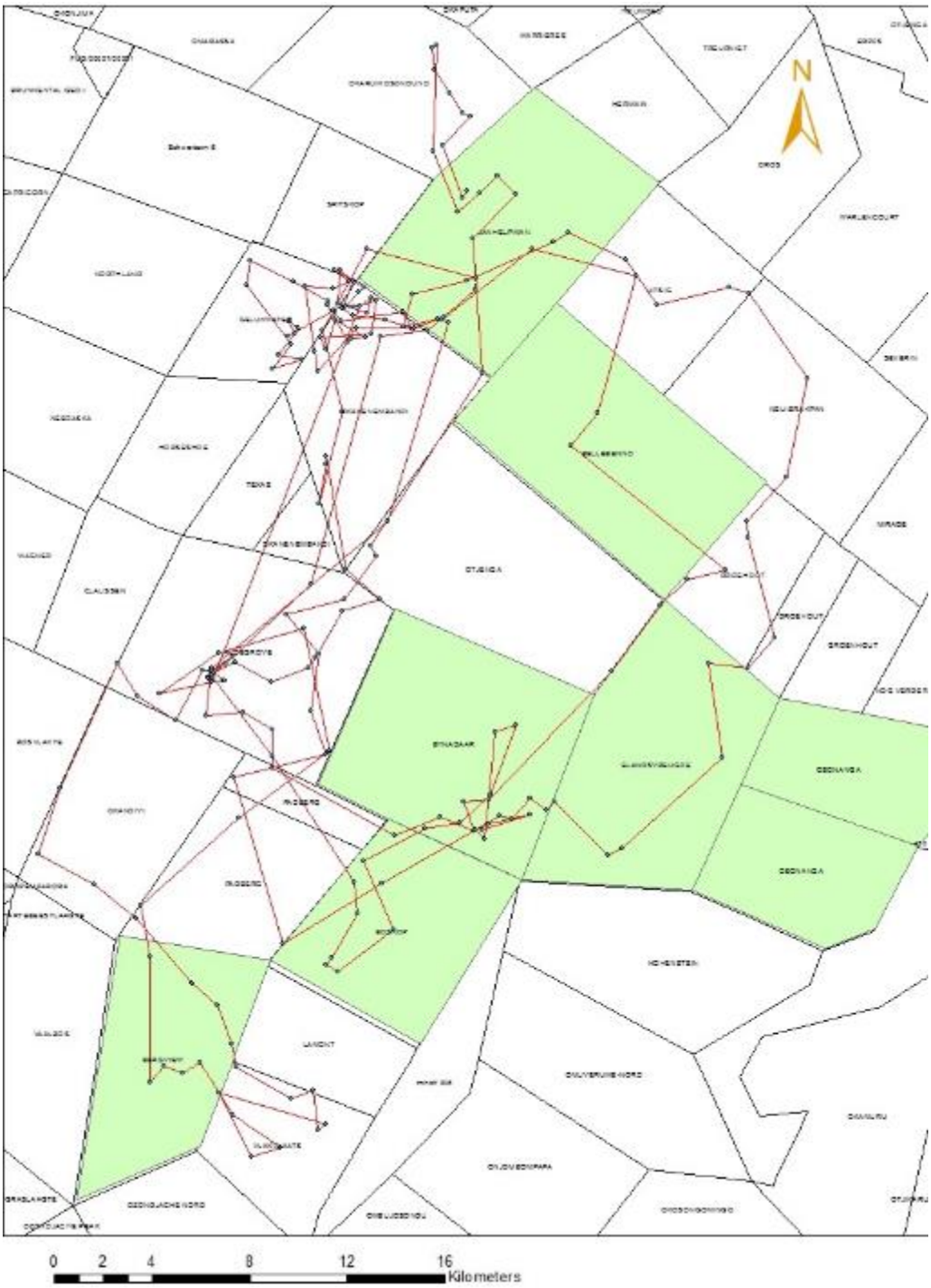

Figure 4: Data from Zinzi's GPS for 2016. Data has been truncated to one point per day. CCF farms are depicted in green. Dots represent daily GPS fixes from the collar. Clusters of points in space indicate possible preference for a particular area or location.

ELI (AJU 1732)

In August 2016, the CCF husbandry team realised that a single adult wild male cheetah was prowling around one of the enclosures (Silver Pens). It was decided to try to capture and collar this male to observe his movements in and around CCF property. A trap cage was set and the cheetah was captured on 1 September. Male AJU 1732 (Eli) was fitted with a Sirtrack GPS/VHF hybrid collar prior to release. Since then, ongoing monitoring has shown that he appears to have established his

territory in CCF property with a particular preference for the Big Field area (Figure 5). CCF's cheetah tracking and ecology units are involved in ongoing inspections of his movements, especially walking in to check on clusters of points to understand his prey selection.

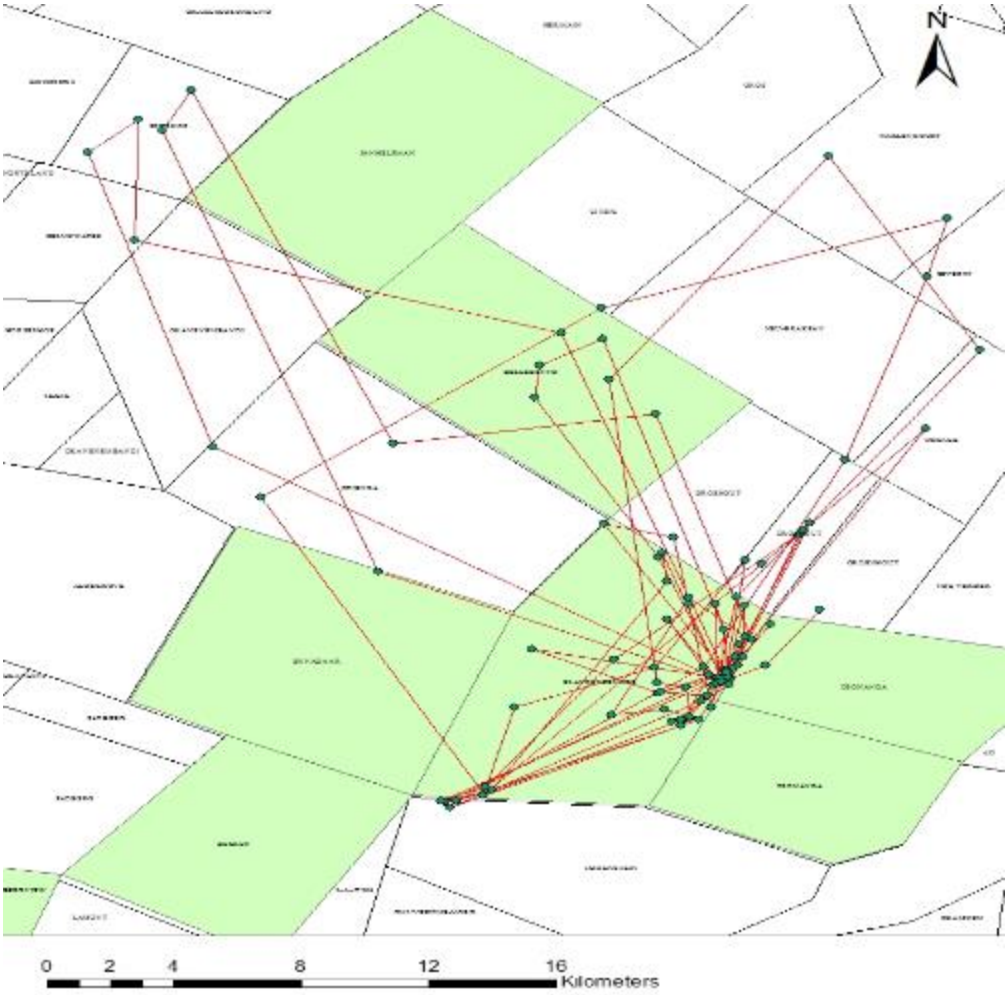

Figure 5: Data from Eli's GPS for 2016 truncated to one point per day. Green farms are CCF property. Points are location fixes from GPS collar.

2. Cheetah Conservation Translocations

Due to the extent of land under livestock production and the habituated cheetahs' need for large uninhabited areas, there is a lack of suitable habitat for release. Since 2004, CCF has been successfully researching into releasing selected orphaned cheetahs back into the wild by developing techniques for successful rehabilitation and release. It's very important to closely monitor the behaviour of individual cats to ensure their health and adaptation to their new environment. Similarly, selecting the right location for each release is of utmost importance. The following are updates on newly or previously translocated and released cheetahs.

CCF Property

Cubs

On 1 August 2016, the CCF cheetah team picked up five 4-month old cheetah cubs at a farm south-east of CCF, on the far side of the Waterberg Plateau National Park. The cubs had been orphaned a few days earlier after their mother was shot as a trophy hunt in an intensive game breeding camp on the farm. The cubs were released into a holding pen at CCF, where they will be kept until they are old enough to be released. These cubs would be too young to survive in the wild and in this instance, removing them into captivity temporarily was the only solution. This will allow them to contribute their genes to the pool, and to be part of the free-ranging cheetah population once they are re-wilded (Figure 6).

Figure 6: Cubs picked up from a farm after mother was shot in a trophy hunt.

Simone and the two cubs (November 2016)

On 28 October 2016, CCF's team went to Okutala farm near Etosha to pick up one wild cheetah female (Simone, AJU 1733) and her two female cubs (AJU 1734 and AJU 1735). A local farmer claimed that the adult female had been attacking his livestock and therefore this was a human-wildlife conflict issue. The farmer had initially wanted to shoot the female and keep the cubs as pets. He had trapped both the adult female and the cubs and was keeping them separately for an unknown period of time. CCF initially attempted to negotiate the release of these cats back onto the property but the farmer did not cooperate. It was then decided to transport the three animals to CCF to attempt to re-bond and release them. After a week, on 5 November, they were released onto CCF property. A Vectronic GPS/VHF hybrid collar was fitted on Simone, the adult female. Unfortunately, one of the cubs (AJU 1734) went missing after two days and is now presumed dead. The tracking team is currently following the movement pattern of Simone and the remaining cub in order to assess their health and possible homing instinct response. She appears to be exploring her new area quite a bit, spending most of her time on Bynadaar farm (Figure 7). The last visual was on a camera trap on the Main Road of the reserve on farm Elandsvreugde, on 7 December (Figure 8). Both mother and cub appear in good condition.

Figure 7: Simone and her cub at Main Road water trough on 7 December.

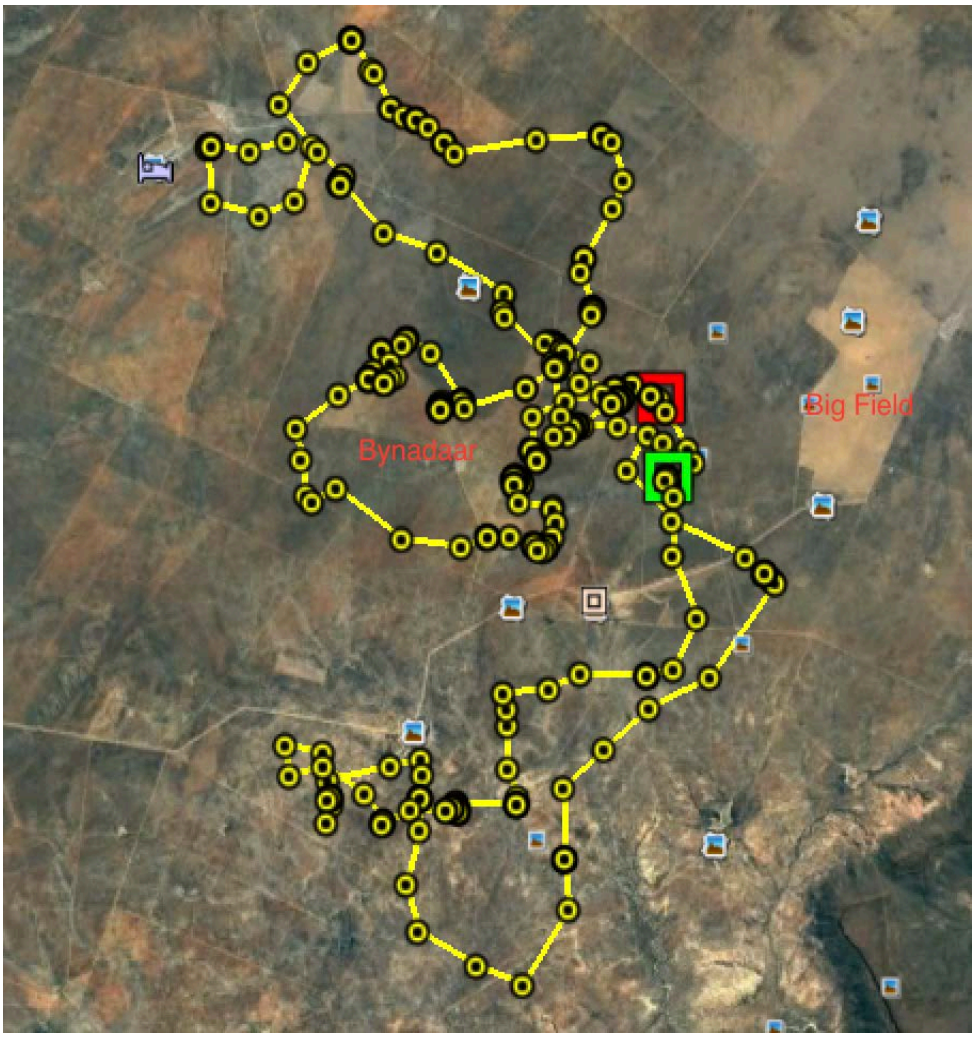

Figure 8: All GPS data for Simone in 2016 (data depicted is based on fixes every 2 hours and showing all data points since release). Red square indicates release point and the green square the last location fix.

Erindi Private Game Reserve

The 'Leopard Pen Boys'

On 28 June 2012, four captive male cheetahs, Omdillo (AJU 1539), Chester (AJU 1540), Anakin (AJU 1545), and Obi-Wan (AJU 1561) were translocated to Erindi and successfully released after VHF collar placement. These males had been previously identified as being candidates for rewilding and had been undergoing rewilding training at the CCF centre. Coalition mates Omdillo and Anakin were found dead in 2012; one shot by a farmer and the other from a possible leopard attack, respectively. Following their release, Chester (AJU 1540) and Obi-Wan (AJU 1561) remained an inseparable coalition of two, reportedly bringing down full-grown antelopes such as red hartebeest and oryx. The pair had even been observed killing adult ostriches, black and blue wildebeest, as well as giraffe calves.

Chester and Obi-Wan occupied a very large home range that encompassed most Erindi (nearly 70,000 hectares), but their core home range was mostly concentrated in a large savannah-like habitat in the south-western part of the reserve. The coalition showed a preference for hunting in

this open area as well. Chester appeared to be the dominant male in the coalition in terms of mating and hunting, despite a semi-lame hind leg.

On 22 September, the CCF team travelled to Erindi to re-collar Chester after being notified by Erindi staff that the GPS/VHF collar had died. The team re-fitted him with a Vectronic GPS/VHF hybrid collar. During the operation, the vet noticed that Chester's teeth were in bad shape and some infected teeth were pulled out (Figure 9). The team discussed a way forward with Chester as he was not in the best shape and could not have been able to tear and chew food. Over the next few weeks he was closely monitored and given a drop-out dart of antibiotics. However, the Erindi staff noticed him falling behind Obi-Wan more regularly, even though he was still able to bring down and kill a wildebeest calf in this time. Unfortunately, Chester was found dead on 29 of November 2016. The exact cause of death is unknown but baboon teeth marks were found on his body. Obi-Wan, now a single male, is being closely monitored since then; he appears to be doing fine and is able to kill for himself.

Figure 9: Chester's teeth condition and rotten teeth being pulled during collar fitting operation.

Savanna and Shandy

Savanna (AJU 1648) and Shandy (AJU 1649) are the two female offspring of Jacomina (AJU 1510), a female released into Erindi Private Game Reserve in 2014. CCF lost contact with Jacomina in 2015 but the collars of Savanna and Shandy are still functioning properly and providing CCF with valuable data. These two females are the first offspring of a re-wilded individual that CCF has collared and therefore are of critical value to the validation of CCF's rehabilitation and release programme.

After separating from their mother in August 2015, at just 16 months, Savanna and Shandy remained together until February 2016. Although the two females have kept separate ranges, there is often overlap. In late January 2016 Erindi notified CCF that Savanna's VHF collar had died and that Shandy's would die soon as well. On 6 February, the CCF team travelled to Erindi to re-collar Savanna and

Shandy. Both females were re-collared with Sirtrack GPS/VHF hybrid collars, which have allowed CCF to collect more fine scale data from these females (Figure 10).

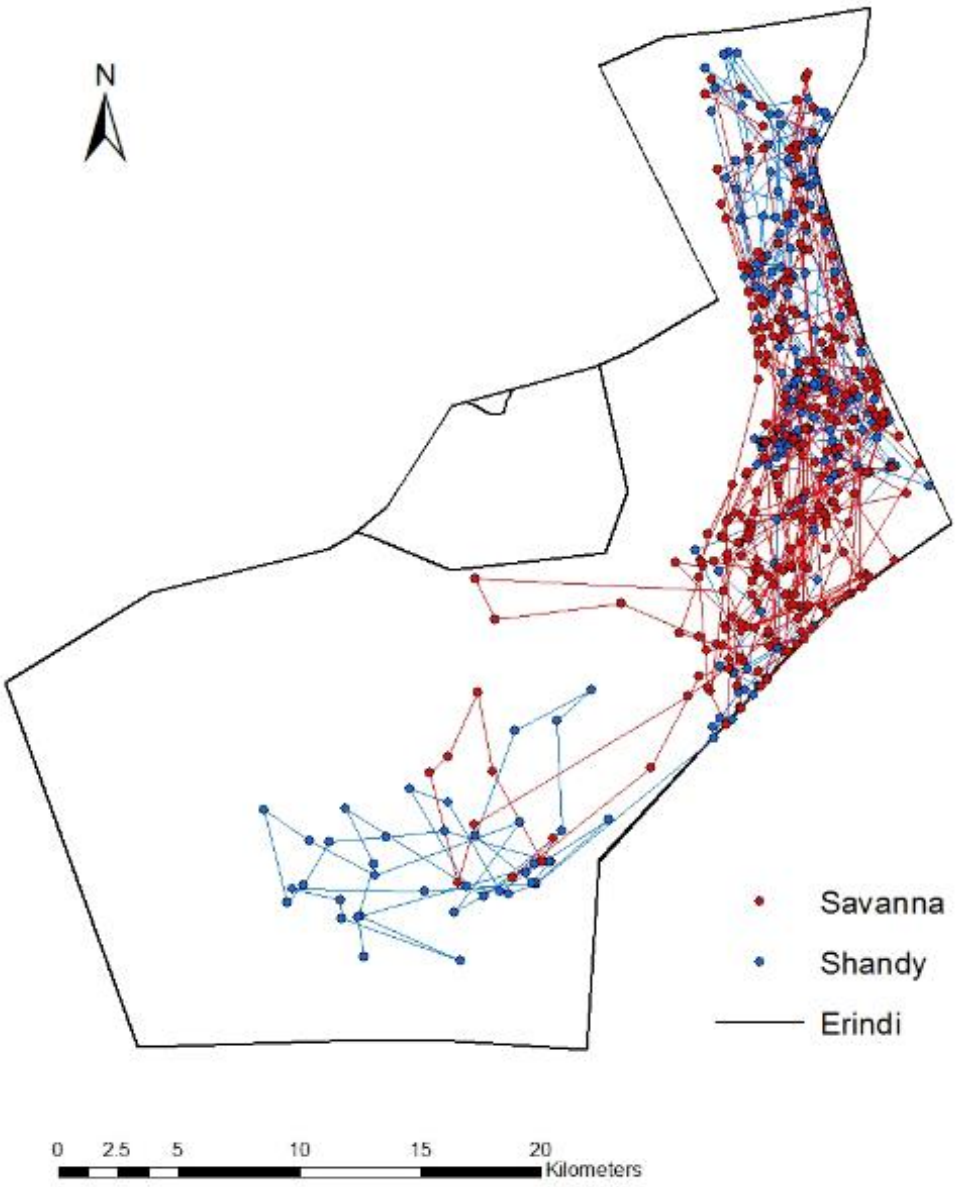

Figure 10: Data from Savanna (red) and Shandy's (blue) GPS collars for 2016; Data has been truncated to one point per day. There is substantial overlap of their home ranges at certain times of year but Shandy appears to have settled in the south and Savanna the north central area of Erindi.

On 3 May 2016, Shandy's GPS data indicated that she had given birth to cubs. On 20 May 2016, CCF's team returned to Erindi to conduct a nest check to count and sex the cubs. CCF found three females and one male, all of which were in great condition (Figure 11). However, unfortunately in early June, Shandy's GPS data indicated that she had lost the cubs. The cause is unknown but another predator likely killed them. Shandy's collar failed on 16 October 2016. The CCF team is currently waiting for her to be in a convenient location to dart and re-collar her with a new Sirtrack GPS/VHF hybrid collar.

These two females represent one of the most significant success stories of CCF's rehabilitation and release programme. They are living evidence of the effectiveness of CCF's rehabilitation and release protocols as they are both surviving on their own in the wild and have started to reproduce. Though Shandy lost her first litter o f cubs, this is not unexpected and she will likely give birth to a second

litter later in the year. Savanna has yet to give birth but CCF expects her to do so in the near future as well.

Figure 11: Shandy's cubs found in river cut-bank.

3. Go Green Project - Carnivore Landscape Distribution and Abundance, human-carnivore conflict mapping and community capacity building.

A project to determine the density and human-carnivore conflict areas for cheetah (*Acinonyx jubatus*) and other key large carnivores across the Greater Waterberg Landscape (GWL) was initiated on 1 September 2015 and is planned to last through 30 August 2018.

The Project will look at CCF's farm, commercial, re-settled farms, affirmative farms and communal conservancies across the GWL, which is made up of five conservancies; Waterberg (E017.268 S-20.418), Ozonahi (E017.45521, S-20.58732), Okamatapati (E018.17983, S-20.42791), Otjituuo (E018.18277, S-20.11415) and African Wild Dog (E018.26267, S-20.95883) (Figure 12).

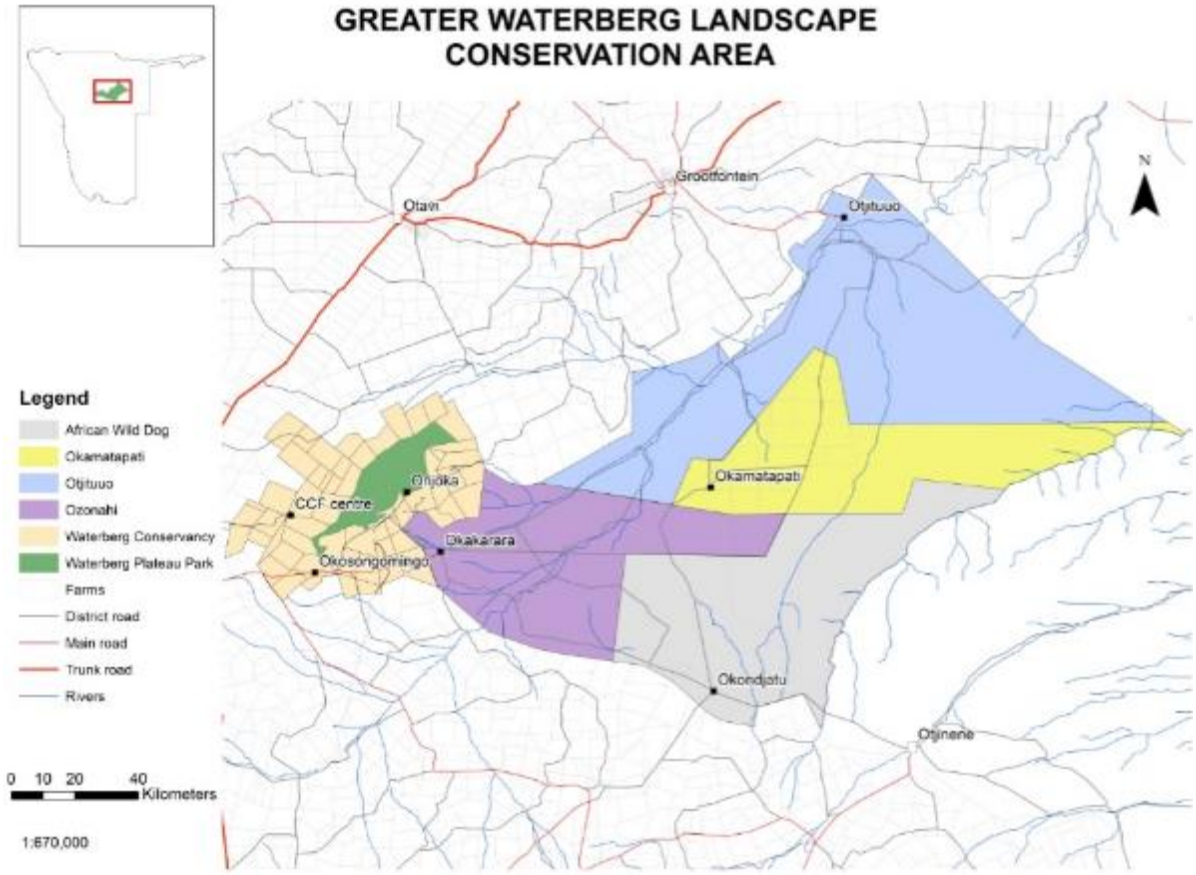

Figure 12: Location of the GWL and the 5 individual conservancies; the Waterberg (commercial) and Otjituuo, African Wild Dog, Okamatapati and Ozonahi (communal).

The current distribution and densities of key carnivore species including the African wild dog and cheetah across the GWL is unknown. However, previous studies have shown that high level of retaliation killing of carnivores due to livestock loss is occurring across the GWL. Therefore, this project aims to use remote camera traps to determine large carnivore presence and densities across the GWL. To establish if the land use type and/or other environmental variables are influencing carnivore densities in the region. In addition to verifying carnivore presence, the project aims to go further by quantifying the level and spatial distribution of human-carnivore conflict that is taking place across the GWL. By mapping conflict zones, resources can be targeted to key areas through education and mitigation methods, which in turn reduce the level of human-carnivore conflict, thus securing the future of large carnivores across the GWL. To also create a comprehensive species list which will be shared with the relevant government departments, conservation non-governmental organisations, conservancy management and their respective communities, the Large Carnivore Management Association of Namibia (LCMAN), and the relevant international organisations, such as the International Union for Conservation of Nature (IUCN) where applicable.

The objectives of this project are:

1. To place and monitor 40 remote camera traps within the pre-defined grid survey areas.

2. To collect, analyse and store photographs from the remote cameras which contain different species that will provide presence points across the study area.

3. To estimate key carnivore species densities from the remote camera trap photographs.

4. To analyse carnivore densities in relation to the known environmental variables.

5. To collect spatial data on conflict areas and map the conflict across the GWL.

6. To use the conflict data to determine a scale of conflict which will reflect the severity of the conflict across the GWL.

7. To determine areas of need from the conflict map based on high carnivore conflict and in turn recommend mitigation methods.

8. To create a comprehensive species list that can be shared with the relevant parties e.g., government, the conservancies, LCMAN.

During this period, two camera-trapping surveys have been carried out with 40 cameras in two areas of the GWL, which was divided into 4km x 4km grid squares (Figure 13).

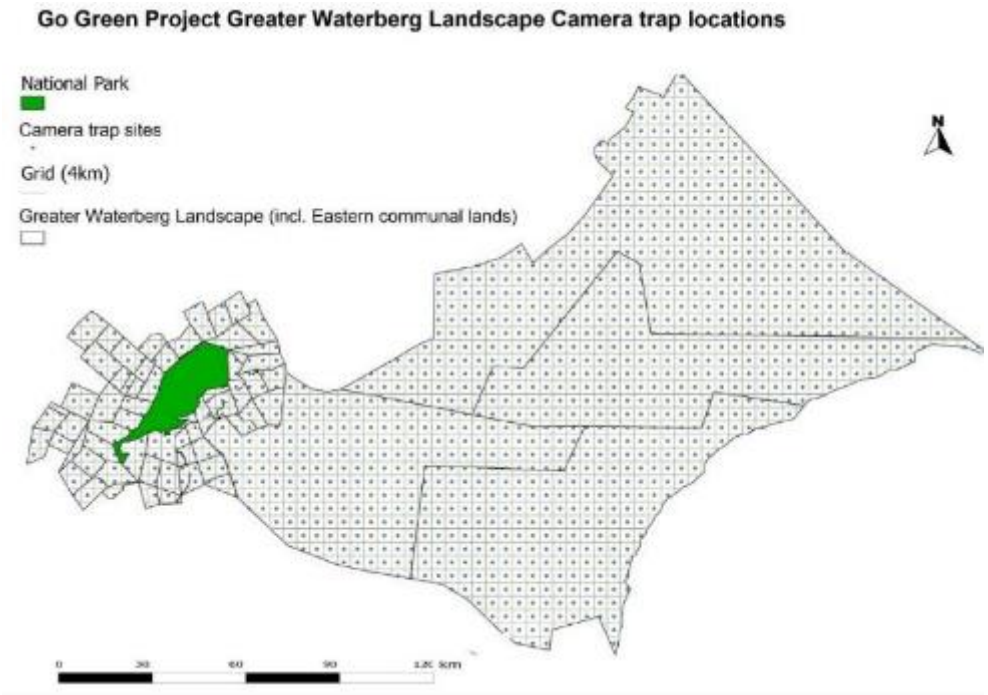

Figure 13: Outline of the whole GWL divided into 4km x 4km grid squares.

1st Survey Area - Survey A:

On 10 February 2016, 40 cameras were deployed in survey area A; an area All the cameras were left out for 30 nights and collected on 14 March 2016 (Figure 14). The cameras during the survey period remained undamaged due to their metal casings. In 30 nights, a total of 301,107 photos were collected. The photos have now been sorted in groups which include individual carnivores, herbivores, empty, error, and unable to ID. Due to the rains, cur grass around the cameras grew up to 2 meters in two weeks, and on occasions covered the camera completely. This had led to a high number of images just containing grass but it also enables us to capture an important environmental event.

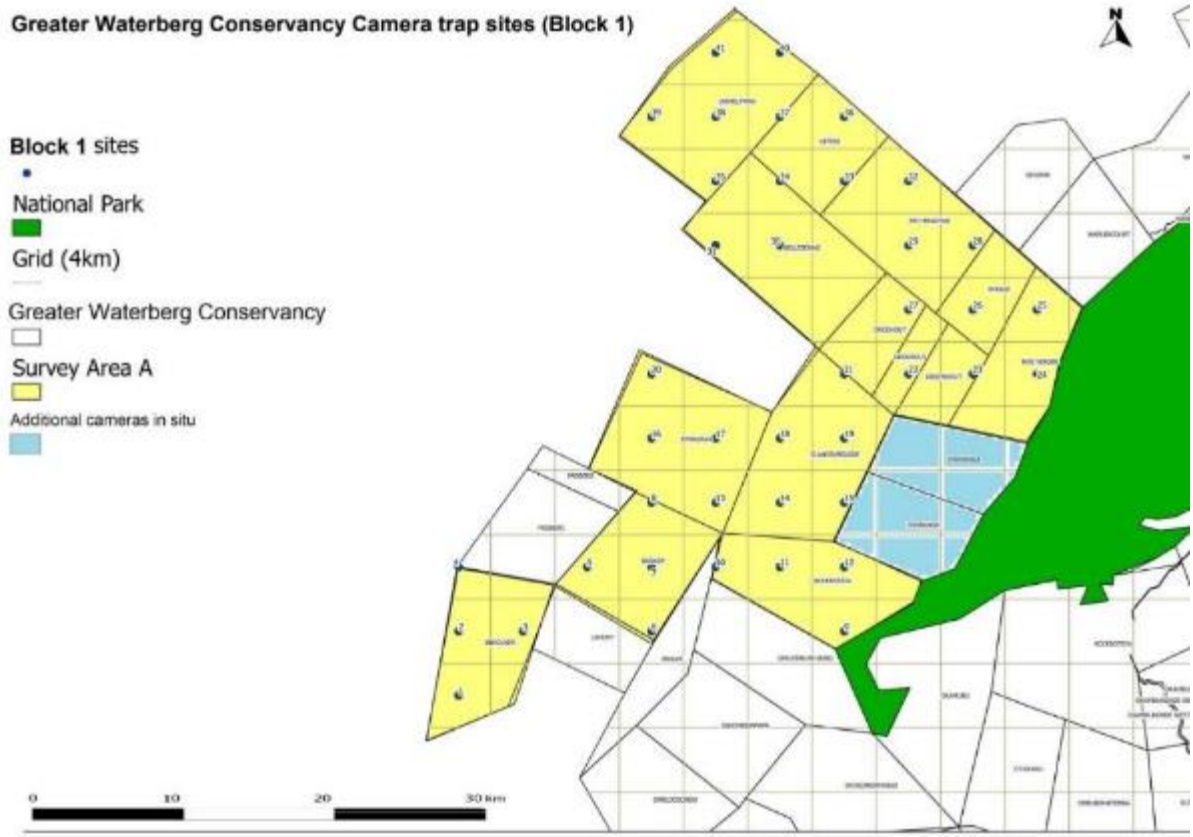

Figure 14: Map of the Survey A area within the Waterberg Conservancy and the location of the 40 camera trap sites.

In just one month the project has already captured every carnivore species found in the Waterberg from cheetah and leopard to bat eared fox and stripped pole cat, except one, the serval. This included a series of pictures of a young cheetah (Figure 15), which is important as it indicates that breeding and dispersal are occurring in the Conservancy.

Figure 15: Example of cheetah captured on a commercial farm bordering the Waterberg National Park as part of the Go Green Landscape project camera trapping in survey A.

The CameraBase database has now been created and the carnivore photos are being entered into this database. All the photos and the database sit on the 2 Seagate 2TB external hard drives purchased through the project acting as a back up to each other.

2nd Survey Area - Survey B:

The 40 cameras were again deployed on 22 March into Survey Area B (Figure 16). The area is made up of six private land parcels, all of which granted access for the project. The land use is a mixture of predator-proof game fencing, normal game fencing and cattle; some farms undertake hunting of both herbivore and carnivore species.

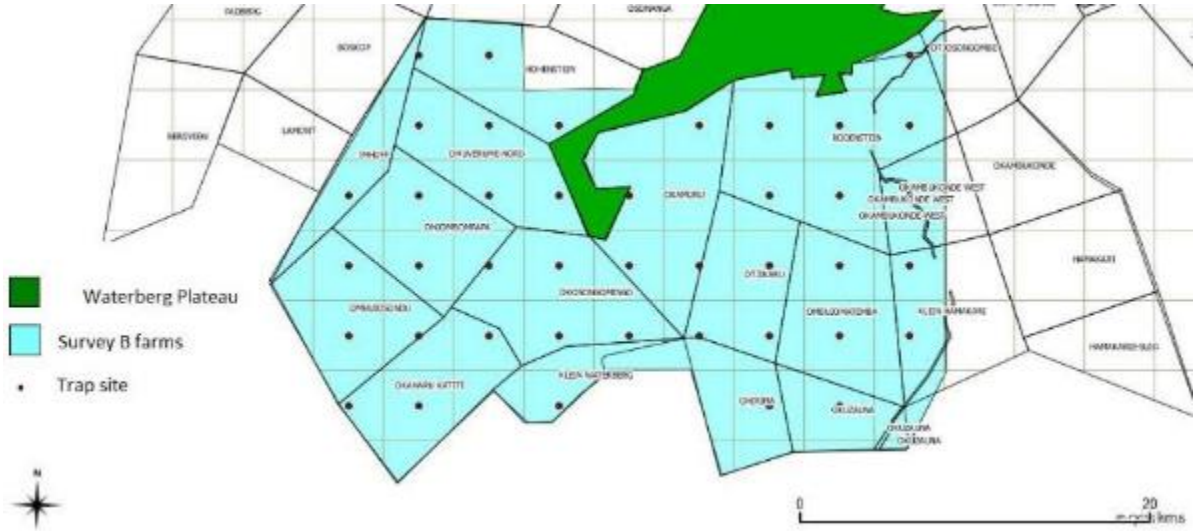

Figure 16: Map of the Survey Area B within the Waterberg Conservancy and the location of the 40 camera trap sites.

After the required 30 nights, these cameras were taken down on 21 April and the process of photos analysed began. To date, 350,000 images have been collected. Additionally, access was acquired to the private land parcels that make up survey area 3 and a total of 20 cameras were deployed on 20 June in the NW section of the Waterberg conservancy. A blog on the CCF web site called 'Cheetahs, Camera Traps & Communities' was set up and to date includes five posts covering camera trap results and our community work.

Pre-camera trapping survey in Okamatapati Communal Conservancy

Cameras were set up in three locations in Okamatapati (All three locations were leaking points along the main water pipeline. These points identified as locations that wild dogs visited to drink (based on sightings by local farmers or spoor). The aim of these cameras was to capture carnivore sightings (wild dog especially), and to assess security in the area, as well as build trust and working relationships with members of the Conservancy. Cameras were put in place with members of the community for added security.

Table 2). All three locations were leaking points along the main water pipeline. These points identified as locations that wild dogs visited to drink (based on sightings by local farmers or spoor). The aim of these cameras was to capture carnivore sightings (wild dog especially), and to assess security in the area, as well as build trust and working relationships with members of the Conservancy. Cameras were put in place with members of the community for added security.

Table 2: Locations and dates of the three remote camera traps set up in Okamatapati.

Trap Name	GPS	Date up	Date down
Camera 1 (R14)	S -20.19871; E 18.52790	09/06/2016	23/06/2016
Camera 2 (R15)	S -20.34409; E 18.50181	09/06/2016	23/06/2016

Camera 3 (R2)	S -20.35829; E 18.27431	09/06/2016	23/06/2016

All traps were safely recovered after a two-week period. Although there were no wild dog pictures, we captured five carnivore species (African wild cat, caracal, jackal, honey badger and brown hyena) over the two-week duration (Figure 17). Of these species, jackal comprised approximately 80% of the photographs. At least two different brown hyenas were captured, and a single caracal. Steenbok and duiker were the most frequently recorded wild game and cows were the most frequently recorded animal.

Figure 17: Examples of carnivores captured between 9-23 June 2016 in Okamatapati.

We intend to continue with “test camera trapping” (not part of a defined survey) in Hereroland, and will try out sites in Ojituuo, African Wild Dog and Ozonahi conservancies over the months of August/September 2016 and prior to our workshops in Hereroland. We expect to increase our capture species list, gain information on behaviour (avoidance/dispersal/roaming/territory patrolling/feeding), and relative abundance of large carnivore species in Hereroland.

3rd Survey Area – Survey Area C:

The 20 cameras deployed in Survey Area C started on 13 of June 2016, all the cameras were left out for 30 nights and collected in from 14 July 2016 (Figure 18). Only 20 camera traps were put out in survey 3 as the remaining survey area for the Waterberg Conservancy needed 60 cameras. One camera was stolen off a farm during this survey period. The cameras during the survey period remained undamaged due to their metal casings. In 30 nights, a total of 250,000 photos were collected. The photos are now being sorted in groups which include; individual carnivores, herbivores, empty, error, unable to ID.

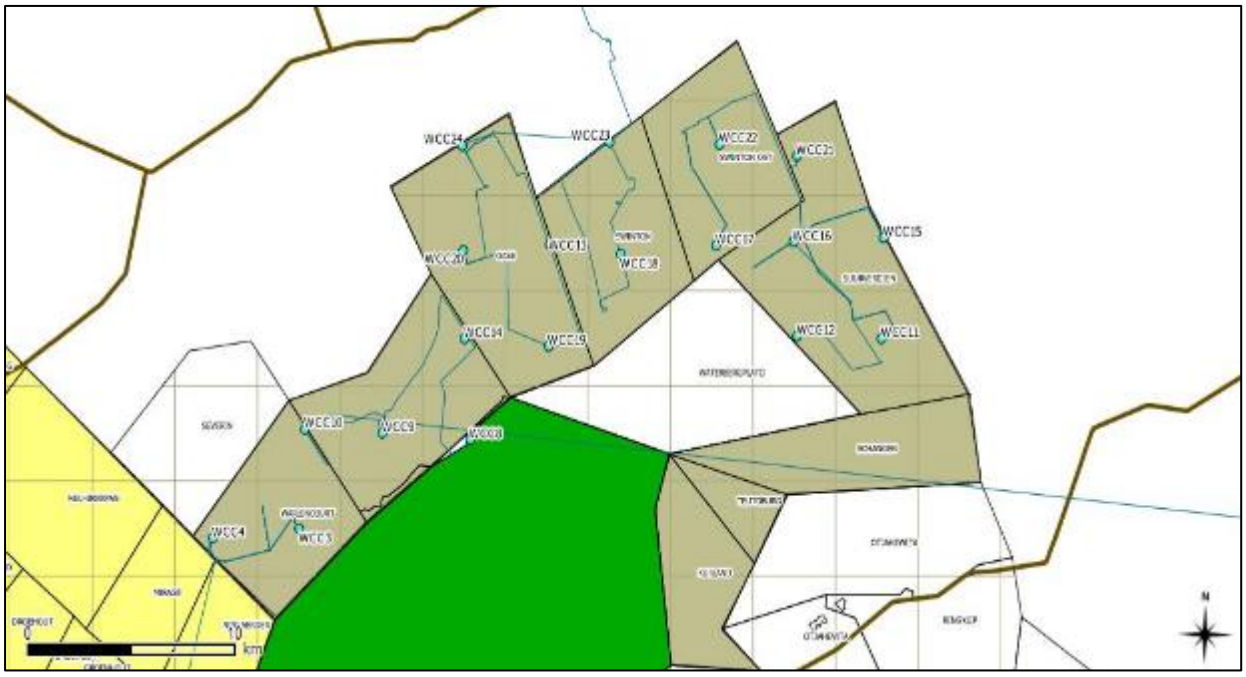

Figure 18. Shows a map of the Block 3 survey area within the Waterberg Conservancy and the location of the 19 camera trap sites.

During the reporting period Survey C cameras were taken down and we commenced with initial analysis of site data. We have set up of the second round of Survey A (dry season) camera trapping at the same 40 sites (Figure 19). This will allow us to undertake seasonal comparisons of carnivore density and spatial distribution which are key outcomes of the project. This will also assist with mitigating human-wildlife conflict between farmers and large carnivores.

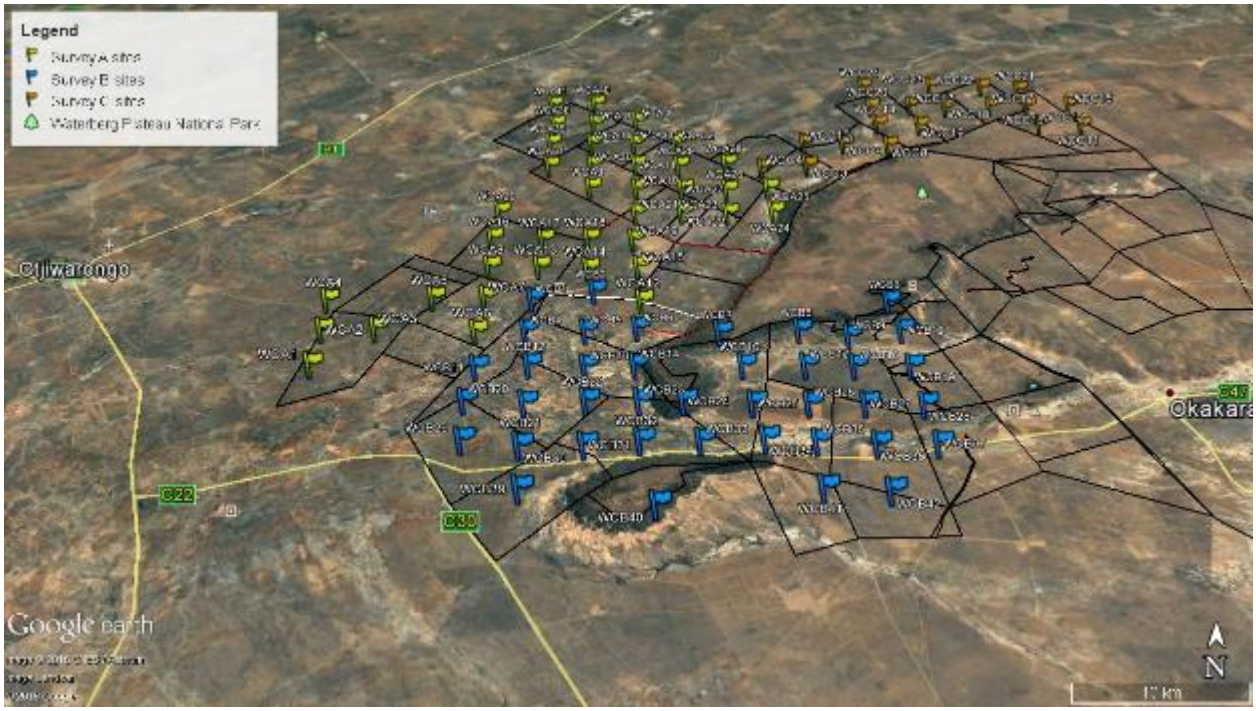

Figure 19. A map showing all camera sites covered in Survey areas A, B and C across the commercial farmland.

We have completed the analysis of first round of Survey A (wet season). As well as generating density estimates for a range of small-large carnivores for the farms in question for both survey A and B. Maps of carnivore distribution for all Survey A farms have also been created. To date in 4 months of camera trapping the project has already captured every carnivore species found in the Waterberg now. We have captured the large carnivores from cheetah and leopard to bat eared fox and stripped pole cat. The CameraBase database has now been created and the carnivore photos are being entered into this database. All the photos and the database sit on the 2 Seagate 2TB external hard drives purchased through the project acting as a back up to each other.

Results to date

The total camera trap nights (4 surveys) is 4,267 during which 924,82 number of photographs were taken (Table 3) and 41 different species were captured (ex. birds) (Table 4).

Table 3. The total number of photographs collected in the 4 surveys.

Survey	Season	Total number of images
Survey A	Wet	177,400
Survey B	Wet	260,548
Survey C	Dry	207,394
Survey A	Dry	279,486
	Total	**924,828**

Table 4. The total number of species captured to date on remote camera traps.

Carnivores	Herbivores	Livestock
Aardvark	Baboon	Cows
Aardwolf	Blesbok	Donkeys

African wild cat	Dik dik	Goats
Banded mongoose	Duiker	Sheep
Bat eared fox	Eland	
Brown hyena	Giraffe	
Caracal	Klipspringer	
Cheetah	Kudu	
Common genet	Oryx	
Honey badger	Red hartebeest	
Jackal	Sable	
Large spotted genet	Scrub hare	
Leopard	Springbok	
Pangolin	Steenbok	
Porcupine	Warthog	
Serval	Waterbuck	
Slender mongoose	Wildebeest	
Small spotted genet	Zebra	
Stripped pole cat		

The total number of carnivore photographs taken was 5,721 with 34,350 taken of herbivore species (Table 5). The high number of empty photographs was due to the rapid growth of the grass during the surveys, at some site the grass grew from zero to 1.5 meters in 2 weeks due to the rains.

Table 5. Shows a breakdown of the photographs collected during our first three surveys.

Survey A	**Wet**	**TOTAL**	**%**	**Av**
	Carnivores	2,420	1.4	60.5
	Herbivores	12,618	7.1	315.5
	Birds	2,854	1.6	71.4
	Omnivores	2,207	1.2	55.2
	Livestock	12,293	6.9	307.3
	Empty	143,644	81.0	3591.1
	Error	726	0.4	18.2
	Unable to ID	336	0.2	8.4
	Insects	93	0.1	2.3
	People	209	0.1	5.2
	Total	**177,400**		
Survey B	**Wet**	**Total**	**%**	**Av**
	Carnivores	1,367	0.52	36.9
	Herbivores	5,966	2.29	298.3
	Birds	1,739	0.67	82.8
	Livestock	1,103	0.42	55.2
	Empty	122,752	47.11	6137.6
	Error	21	0.01	1.1
	Unable to ID	303	0.12	15.2
	Insects	18	0.01	0.9
	People	2,416	0.93	120.8
	Baboon	598	0.23	29.9
	Porcupine	56	0.02	2.8

	Total	260,548		
Survey C	**Dry**	**Total**	**%**	**Av**
	Carnivores	1,934	0.9	120.9
	Herbivores	15,766	7.6	985.4
	Omnivores	1,308	0.6	81.8
	Birds	2,173	1.0	135.8
	Livestock	10,744	5.2	671.5
	Empty	174,052	83.9	10,878.3
	Error	61	0.0	3.8
	Unable to ID	203	0.1	12.7
	Insects	1	0.0	0.1
	People	1,152	0.6	72.0
	Total	**207,394**		

Leopard ID Analysis

The initial focus of this study is CCF land, where we also carried out a basic capture-recapture analysis using the software CAPTURE, estimated the density and the occupancy with PRESENCE for the animals identified in Survey A (a 180km^2 area comprised of CCF land and immediate surrounding farms).

We have completed the analysis of leopard density and occupancy across Survey A, B and C farms for the wet and dry season, using spot patterns (Figure 20). This data will be used as part of an ongoing survey of leopard across the commercial Waterberg Conservancy.

Figure 20. An example of a leopard captured on a camera trap and the patterns used for ID.

Forty-two leopards have been identified in our study: 23 in survey A, 12 in survey B and 7 in survey C (Table 5 and Table 7). The population estimate for survey A on CAPTURE was 26 (SE = 4.0384), with approximate 95% confidence interval of 25 – 47 and the occupancy estimate in PRESENCE was 0.4884 (Figure 21). The density estimate for survey A is 13.8 – 26.1 leopards / 100 km^2.

Table 6. Data collected for leopards in surveys A, B and C.

Survey	Camera trap nights	Total pictures	Leopard pictures	Pictures used for ID	Leopard Captures	Stations with leopard presence	Identified individuals
A	1343	363731	322	207	61	22	23
B	1209	341443	93	54	26	13	12
C	608	215389	77	35	20	8	7

Table 7. Sexual identification of leopards in surveys A, B and C.

Survey	Males	Females	Unknown	Total
A	8	10	5	23
B	4	4	4	12
C	4	2	1	7
				42

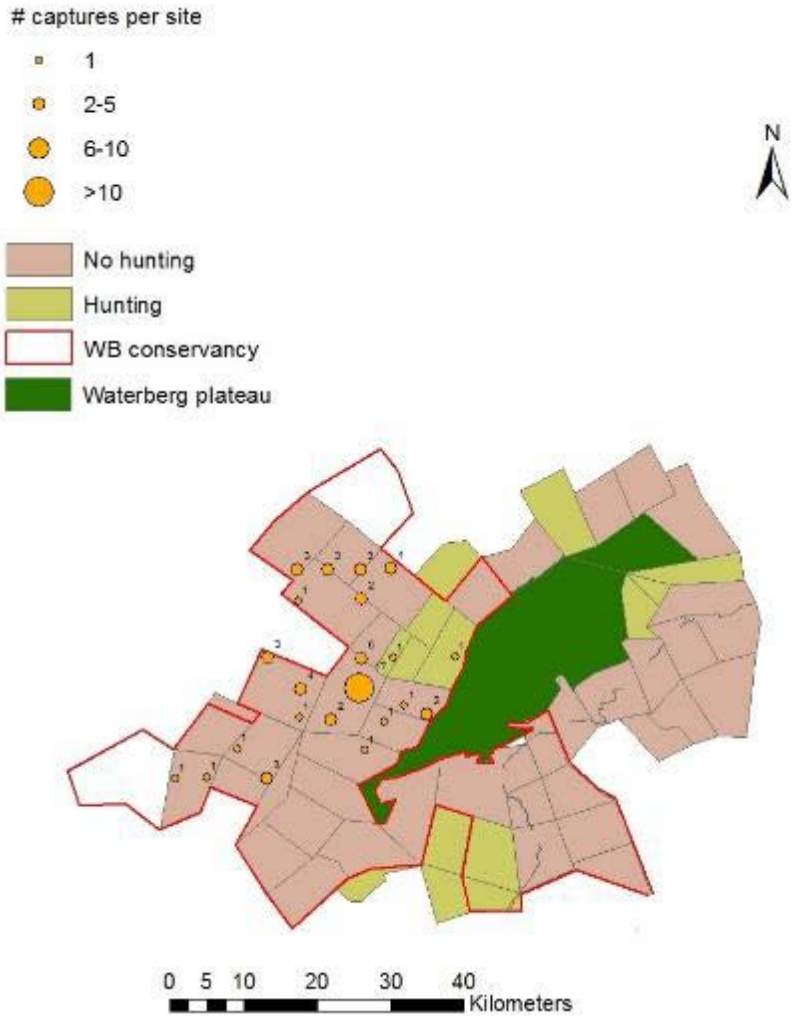

Figure 21. Leopard area usage in survey A.

Continuation of pilot camera trapping survey in communal conservancies

Cameras were set up in two locations in Otjituuo and Okamatapati (Table 8). Both locations were leaking points along the main water pipeline. These points were also identified by CCF staff and local farmers as being spots that wild dogs visited to drink (based on sightings or spoor tracks). The aim of these cameras was to try and capture wild dog sightings, but also to assess security in the area, and to build trust and working relationships with members of the two conservancies. Cameras were put in place with members of the community for extra security.

Table 8. Locations and duration of the 2 pilot study camera traps in Otjituuo.

Trap Name	GPS	Date up	Date down
Camera 1 (CC25)	S -20.26439; E 18.51372	21/09/2016	End October
Camera 2 (R6)	S -20.25980; E 18.46767	21/09/2016	End October

We continued with "test camera trapping" in across the 4 communal conservancies, over the months of October, November, and December 2016 during the training workshops. The project will increase our capture species list as well as increase our knowledge on the location and relative abundance of large carnivore species in the eastern communal area.

4. Angola Carnivore Research

As part of CCF's long-term vision and following Dr Marker's initial trip to Angola in 2010, CCF continues to engage with the Ministry of Environment in that country. This engagement seeks to establish a working relationship/collaboration aimed at improving our knowledge regarding the status of cheetah and other carnivores there, as well as building capacity through training. To this end, the Angolan Ministry has welcomed both projects, with the first survey conducted in December 2014. CCF and other partners are planning rapid surveys.

Angola Surveys

During the first half of the year, Dr Fabiano continued to engage with the Ministry of Environment in Angola towards conducting a complete carnivore survey at the Iona National Park and the Angolan component of the Kavango-Zambesi Transfrontier Park (Ao KAZA). The former is a continuity of the early survey of Iona he conducted late in 2015. However, due to logistics and lacks of funds, a planned camera trap survey for 2016 was not conducted. As for Ao KAZA, Dr Fabiano is collaborating with Panthera, which has recently signed a MoU with the Angolan Ministry of Environment and is currently conducting carnivore surveys in this area.

Additionally, Dr Fabiano signed a three-year MoU with the National Institute of Biodiversity and Conservation Areas, Angolan Ministry of Environment. During the second half of the year the team conducted a camera trapping survey of Mavinga-Luiana National Parks (NP). Data is currently being processed. Dr Fabiano and associates used this opportunity to train Angolan biologists on the use of camera traps for monitoring wildlife. A biologist also spent three days being trained on scat diet analysis at UNAM. Furthermore, Dr Fabiano, with colleagues from the Research Centre in Biodiversity and Genetic Resources (Portugal) and UNAM have commenced a long-term monitoring of wild dogs at the Bicuar NP. Camera trap results are expected by mid-2017.A total of 51 samples were extracted during 2014-2015 with the aim of determining genetic diversity and minimum abundance. Of these, 27 were of cheetah, eight did not amplify, and the rest belonged to either serval, leopard, or Brown hyena. From the 27 cheetahs, there are about 7 unique individuals. This

sample size is below the number recommended for a robust assessment of this population genetic diversity. Hence, we continue to collect samples.

Results of previous rapid sign surveys (spoor) conducted in the Iona NP (Dr Marker/Dr Fabiano, 2010; Dr Fabiano, 2014 & 2016 pers. comm.) indicated that the most abundant large carnivore in the park is Brown hyena (~15 individuals in the plains), followed by cheetah (10 individuals) and leopard (7 individuals). In addition, preliminary results from a socio-economic survey indicate that leopard is the felid representing most conflict in this park.

The next steps include securing funding to acquire additional camera traps (currently 20 units are available through a MBZ grant), conduct a camera trapping survey at Iona later in December 2017, a rapid survey at Cameia NP (August – October) and a second camera survey at Bicuar NP.

Overall, CCF is pleased by the Angolan Ministry of Environment taking a leading role, with CCF and other partners serving as supporters of the Ministry's activities towards the conservation and management of carnivores and other biodiversity in Angola, for the benefit of the Angolan people.

From 18 to 21 October, CCF was represented at the Angolan National Planning Workshop for Cheetah and Wild Dogs. The workshop is part of the Rangewide Conservation Program for Cheetah and African Wild Dog (RWCP) initiative and was organised on invitation by the Angolan Ministry of Environment. Approximately 30 people participated, including Angolan government representatives and park administrators, as well as international NGOs and tertiary institutions. Participants reviewed threats facing the cheetah and wild dogs, having identified challenges such as lack of awareness about the cheetah, human wildlife conflict, reliable cheetah population estimates and poaching of prey species. The group also updated distribution maps of the Mavinga-Luiana National Parks, where surveys have been conducted (Figure 22).

In his closing remarks, the director of INBAC (National Institute of Biodiversity and Conservation Areas) reiterated that CCF could serve as a resource to assist the Angolan government in implementing their conservation strategy. A document was developed as an outcome of this workshop and will be submitted to the Angolan government for inclusion in their national conservation strategy for both species.

Figure 22. Resident range of cheetah in Angola 2016.

G. Ecosystem Research

Over 80% of Namibia's game inhabits commercial or communal farmland, and outside of protected areas, long-term study of these systems is crucial towards wildlife conservation measures and the viability of cheetah, their prey and their habitats. CCF monitors densities and population trends for all the common game species on the farms that make up CCF, via transect and water point count techniques. Large carnivore numbers are monitored annually via camera trap surveys (Go Green – leopard, Brown hyena, and caracal) and (Playtree Survey – Cheetah). An important ongoing project is assessing the impacts of bush-encroachment and of bush harvesting on soil health, water retention as well as biodiversity at cleared and encroached sites. This research is critical as bush encroachment of favoured habitat can adversely affect herbivores and cheetahs. In addition, CCF staff maintain a record of daily rainfall and temperatures at the centre. These are summarised and presented below with a discussion about the impact of rainfall on herbivore abundance and movement.

1. Weather Monitoring

CCF collects rainfall and daily temperature readings at its man Centre. Between January and December 2016, the CCF Centre received a cumulative total of 358 mm of rain. This is slightly lower than the total rainfall in 2015 (370 mm) and substantially lower than the 12-year mean of 550 mm from 2005-2016. The lowest yearly rainfall was recorded in 2007 at 165 mm; while the highest was in 2011 at 1101 mm. Figure 23 below demonstrates the variability in rainfall in the area. This variation influences the condition of the *veld* via grass quality and biomass as well as surface water distribution (dams and water holes) and therefore is a direct driver of herbivore ranging patterns

across the farms. In comparison to past years, CCF has now experienced two relatively dry years in a row, an indication of the drought cycle that the area and the region are experiencing. This currently affects and will continue to have an effect on the carrying capacity of the land and on herbivore densities. Figure 24 displays the monthly mean maximum and minimum temperatures recorded.

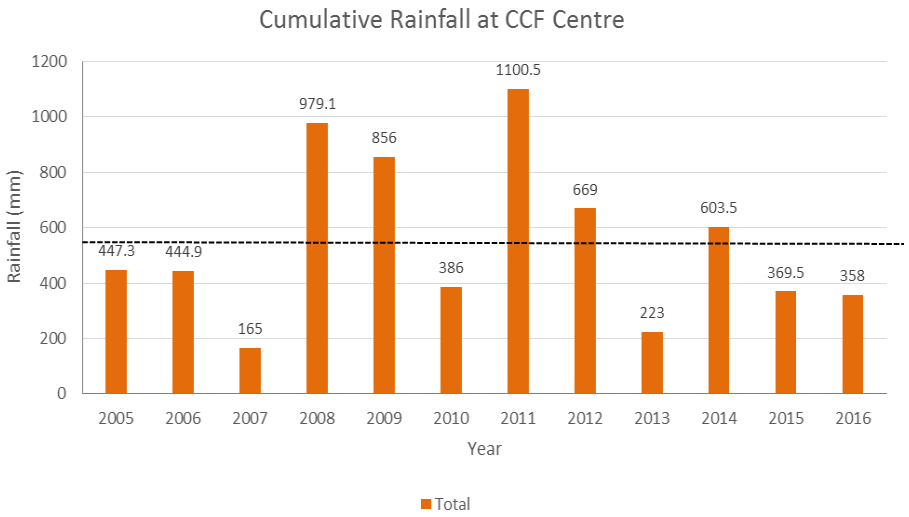

Figure 23: Annual cumulative rainfall at CCF centre from 2005 to 2016. The dashed line represents the 12-year mean (550 mm).

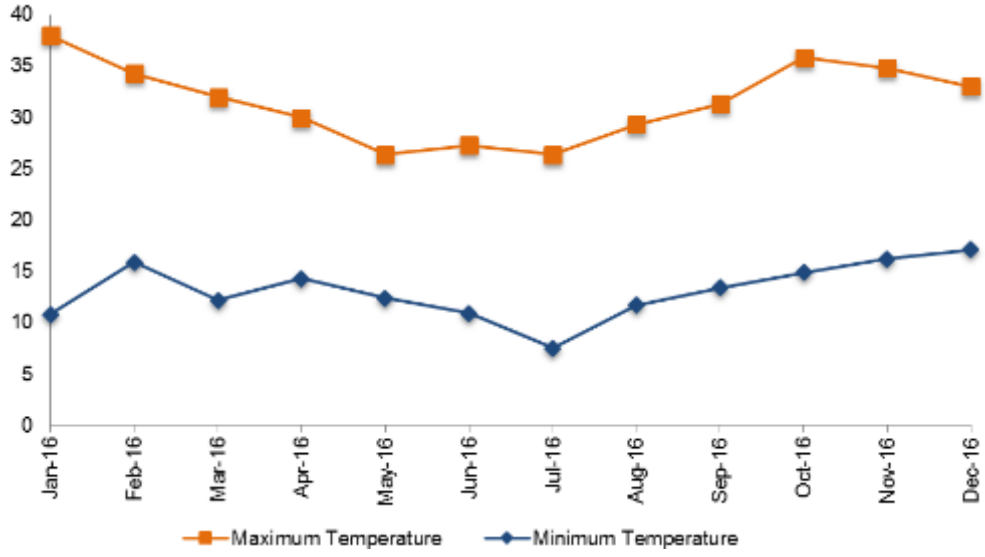

Figure 24: Monthly minimum and maximum temperatures (centigrade) at CCF Centre for 2016 (data displayed is based on a monthly average).

2. Game Monitoring and Prey Habitat Preferences

CCF's long-term wildlife monitoring programme continues with the assistance of volunteers and student interns. The game counts are designed to understand patterns and trends of game density, movements, demographics, and habitat use. The monitoring involves monthly road-strip counts, bi-monthly waterhole counts and ongoing intensive camera trapping surveys.

Big Field Game Counts

CCF's Big Field, known also as 'The Little Serengeti', is an old, uncultivated field of 1,492 hectares. The field is among the largest open, uncultivated patches of land in the north-central farmlands and attracts a high number of free-ranging game. This area provides an ideal case study to monitor ecological successional trends as it generally supports high prey densities for carnivores like cheetahs and leopards. Because game tends to concentrate in this area, monitoring trends and understanding the dynamics of herbivore performance here serves as an ideal indicator of the health of the system. For this reason, CCF has been conducting monthly counts on Big Field since 2004.

During this reporting period, a total of 35 replicate counts were conducted on the Big Field, resulting in a sampling effort covering 715.2 km. These counts covered the three routes on the field: Chewbacca Road (7.2 km), Midfield Road (8 km), and Osonanga Road (4.76km). Teams of staff and interns record species observed along the route (including total number, age class, distance to vehicle and distance along transect. All data from these surveys were entered into a database and the Distance software program used to calculate density estimates for several key species (Results are compared to estimates from the previous year's survey in order to examine population fluctuations and a simple trend. Reasons for major changes in population estimates are discussed.

Table 9 and Figure 25). Results are compared to estimates from the previous year's survey in order to examine population fluctuations and a simple trend. Reasons for major changes in population estimates are discussed.

Table 9: Population estimates (mean ± lognormal confidence intervals) of common game species counted on the CCF Big Field in 2016. Estimates are given with 95% lower (N LCL) and upper (N UCL) confidence limits.

Common name	# obs. per species	CV	Population estimate		
			Mean	Lower CI	Upper CI
Steenbok	193	0.33	229	65	807
Warthog	421	0.13	492	347	698
Springbok	81	0.61	128	17	994
Red hartebeest	138	0.29	129	57	290
Oryx	298	0.12	292	229	371

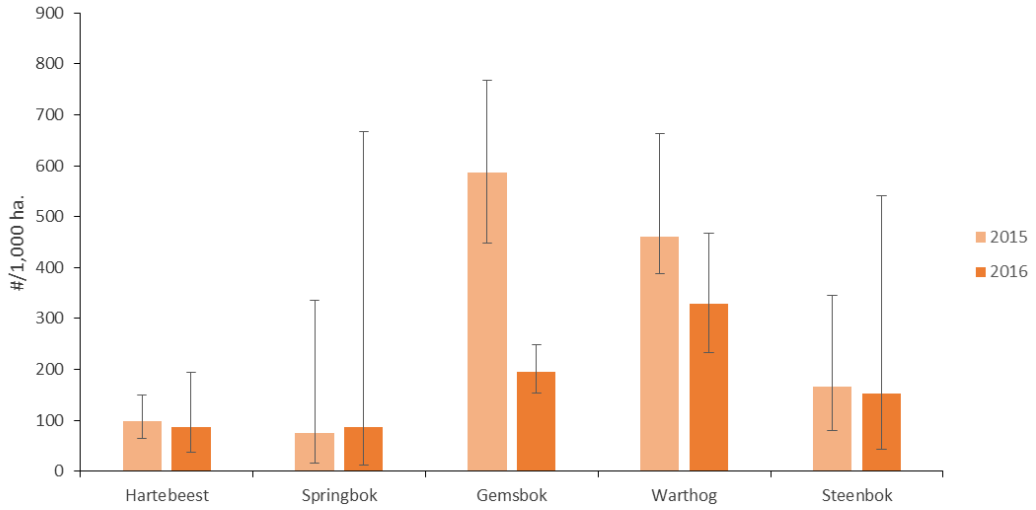

Figure 25: Two-year game density comparison for common herbivore species on Big Field (based on monthly distance-based counts in 2015 and 2016). The error bars represent upper and lower confidence limits around the mean (indicating the possible maximum and minimum estimate of population size).

The Big Field is still supporting high numbers and therefore experiencing intensive grazing pressure. However, the effects of this are reduced in the dry season when a total lack of rainfall results in little or no grazing on the field Figure 26. The combined effects of two consecutive years of lower rainfall and intensive wet season grazing appear to be resulting in decreases in some of the bulk grazing species. Both gemsbok and warthog estimates are much lower than 2015, while most of the other species seem to have remained relatively constant. This contrasts with last year when oryx and warthog showed significant increases in comparison to 2014. Springbok estimates are not reliable due to a very large confidence interval, but appear to be maintaining a steady population. Species such as kudu, eland and duiker could not be analysed due to a lack of sufficient encounters. These species also favour thicker habitat types and should be covered by transects in these habitats.


Figure 26: Photograph of the CCF's Big Field at the end of the dry season/beginning of the wet season showing the complete lack of grass cover.

Local migrations and movements of game appear to play a large role in the Waterberg Conservancy, as well as on areas like the Big Field. Very few eland sightings may be related to the mini eland migration that takes place annually. Gemsbok have also been seen to be widely dispersed following sporadic rains and the infrequency of rainfall leading to shifting movement responses may be the cause of reduced numbers of the larger antelope on Big Field.

Circuit B Counts

During this reporting period, a total of 24 game counts were conducted on Circuit B, resulting in a sampling effort of 648km. Table 10 displays the most common wildlife species observed on Circuit B during 2016. Oryx remain the most frequently observed species, followed by steenbok and warthog (Figure 27). Despite nocturnal counts being done for species like duiker, these only accounted for 4% of the sightings. Very few eland and kudu sightings were obtained and estimates for these two species continue to be an issue.

Table 10: Population estimates (per 1,000 ha.) of the most common wildlife species observed on Circuit B in 2016. Estimates are given with 95% lower (N LCL) and upper (N UCL) confidence limits.

Common Name	# obs.	Distance		
		N	N LCL	N UCL
Oryx	160	31	17	55
Red hartebeest	30	11	8	17
Springbok	42	18	11	30
Warthog	77	20	15	26
Steenbok	112	25	20	30
Duiker	17	3	2	4

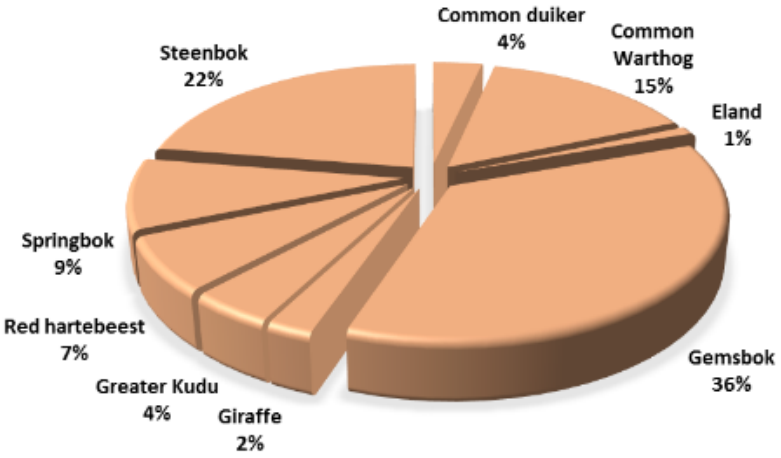

Figure 27: Frequency of sightings of game species on Circuit B in 2016.

Species density estimates from Circuit B mirror the estimates from Big Field. Substantial decreases in gemsbok and warthog (Figure) are again probably indicative of a shift in distributions following a second low rainfall year in succession. Hartebeest numbers also decreased slightly on Circuit B, but given the large numbers of hartebeest being seen on other CCF farms (Boskop and Bynadaar), it is likely that there have been significant shifts in distribution of this species as well.

Eland and kudu are not being picked up frequently enough along Circuit B. Eland appear to have migrated out of CCF land, and although large groups numbering up to 40 animals are occasionally seen, they are not present during the counts. We suggest a different method of counting eland, either aerial counts from a fixed wing aircraft/glider or using waterhole count numbers to supplement the road strip counts. We suggest the same for kudu, as we are suspect that there are high densities of kudu on CCF land, but they are not showing up on the drive count routes. Again, aerial census or creating more transects in bushy habitats, as well as altering the time of day of the counts, may rectify this.

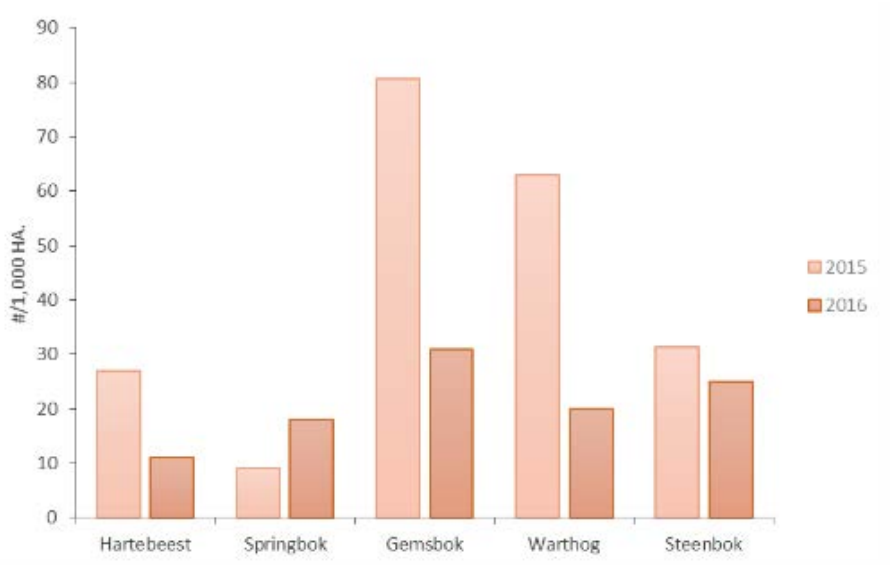

Figure 28: Density estimates (animals per 1,000 ha.) of common antelope observed on Circuit B in 2015 and 2016. Estimates were derived from distance sampling.

Bellebenno 12-hour Waterhole Counts

To assist in managing game within the 4,000-ha game-fenced Bellebenno camp, CCF started bi-monthly 12-hour waterhole counts in 2008. CCF volunteers and staff members assist with these on-going counts, which involve being positioned in hides at each of Bellebenno's four waterholes and counting animals that come to the waterhole. Information such as species, age, sex, and condition are recorded on standardised sheets, as well as whether the animals utilise the waterhole or the salt lick placed at the site. The counts take place from 6 a.m. to 6 p.m. with two observers in each hide.

From January to December 2016, waterhole counts were conducted on a bi-monthly basis at the four waterholes within Bellebenno. A total of 2,830 animals were counted from 10 different species (**Error! Reference source not found.**) compared to 4,600 in 2015. Figure 28 shows the proportional abundance of game species recorded. Warthog and zebra were the two most abundant species observed at waterholes, both very water dependent species. Eland were also frequently observed, which is not surprising given their daily water requirements. Red hartebeest, steenbok and impala were seen a few times. Kudu and duiker were hardly seen probably due to the fact that are shier and more nocturnal.

Table 11: Actual numbers of animals counted and densities (animals per 1,000ha) for the common game species in the Bellebenno Game Camp 2016.

Common Name	# counted	Density (# per 1000 ha)
Eland	377	94
Giraffe	116	29
Impala	41	10
Gemsbok	222	56
Warthog	1297	324
Zebra	703	176

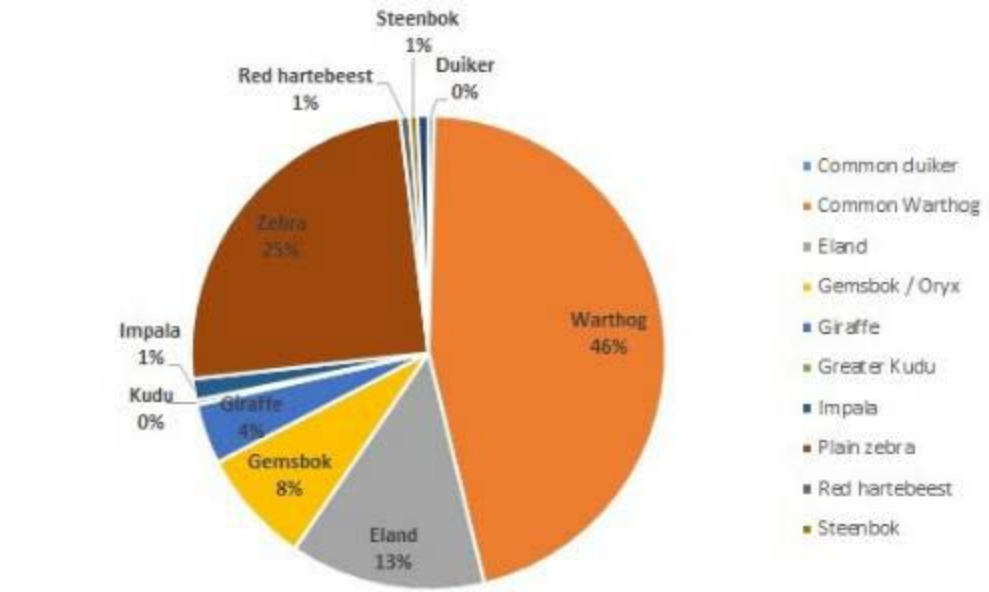

Figure 28: Proportional representation of game in the Bellebenno Game Camp in 2016 (based on counts at n=4 water points).

Higher numbers of eland were recorded during the second half of the year (Figure 29) similar to 2015 observations. This period relates to the dry season, and eland become more dependent on visits to waterholes to drink. Warthog remained consistently high through the year, except for a dip during March, a wetter period. Zebra, gemsbok and giraffe numbers did not fluctuate much throughout the year, save perhaps for a drop-in sighting in March, again probably related to a wetter period. Impala were observed in counts from July onwards and it appears that they found a way into Bellebenno from a neighbouring property. Bellebenno is again overstocked, and there are clear signs of consistent overgrazing. This would lead to certain species attempting to move out of the farm to access better grazing on surrounding farms.

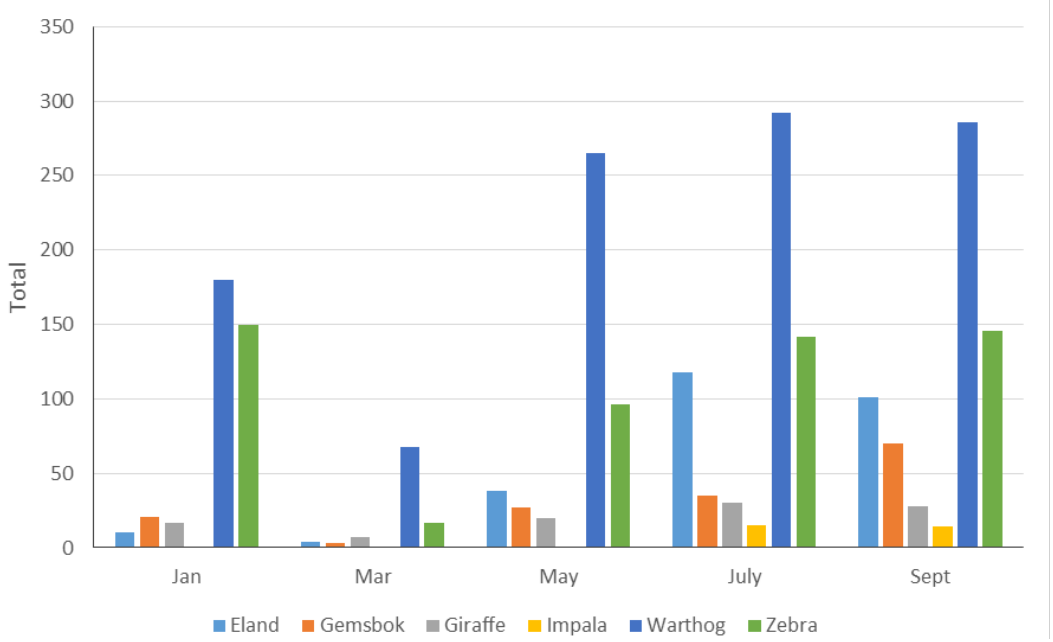

Figure 29: Total abundance of the six most common species at Bellebenno in 2016 (data displays the sum of counts for each species at n=4 water points).

In comparison to 2015 counts, game numbers appear lower in general (Figure 30), and are likely linked to another low rainfall year and simultaneous overgrazing that has been observed in

Bellebenno. Warthog, eland, hartebeest and gemsbok numbers were much lower than 2015 while zebra and giraffe were similar. Warthog numbers decreased significantly in Bellebenno. Warthog are very sensitive to overgrazed areas and there is little doubt that the large drop in numbers is due to warthog moving out of Bellebenno in 2016. Giraffe depict a slight increase and there were several cases of giraffe breaking out of Bellebenno in 2016 due to over stocking and high competition. There is now a fairly large number of giraffe on Elandsvreugde that is good for wildlife sightings. Eland, zebra and gemsbok numbers remained stable and similar to the previous year. Zebra numbers are still very high and a cause for concern, as they lose condition rapidly when confined to overgrazed areas. As zebra need to drink often, waterhole counts work well for this species (Figure 31). Kudu were hardly seen at this year counts but we expect them to move out with ease given their jumping ability. Impala were picked up several times during the count, and it is thought that they are escapees from a neighbour's farm. Their numbers should be closely monitored as they can breed quickly and outcompete other browsers and grazers.

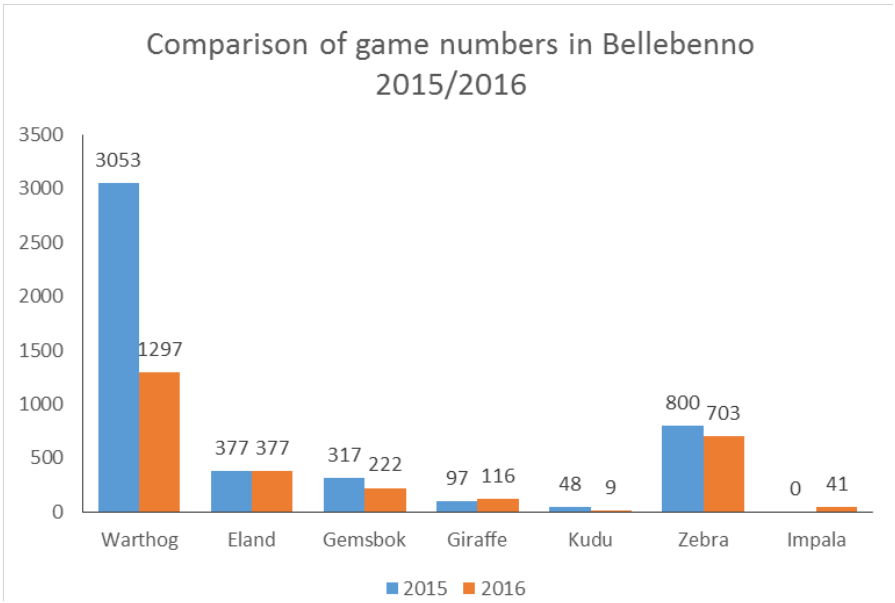

Figure 30: Comparison of abundances between 2015 and 2016 for common species at Bellebenno (based on counts at n=4 water points).


Figure 31: Zebra drinking at a waterhole in Bellebenno farm

A temporary opening of Bellebenno's main gate will take place in early 2017 to facilitate movement of game into Elandsvreugde and thereby easy the grazing pressure. If animals are shown to move out regularly, the gate will be left open for longer periods of time. It is expected that giraffe (Figure

32) and zebra in particular will disperse out of Bellebenno and onto neighbouring farms, given the current high stocking rates within Bellebenno.

Figure 32: Giraffe foraging on the Bellebenno property of CCF.

3. Bush Encroachment and Biodiversity

Bush encroachment is an environmental problem threatening Namibia's rangeland productivity, food security, and biodiversity conservation nationwide. However, it also has potential as a renewable resource for alternative energy, especially in rural areas, and may alleviate electricity shortages projected to affect Namibia in the near future.

CCF, the University of Hamburg in Germany and the University of Namibia (UNAM) entered into an agreement to study the impacts of bush encroachment and bush clearing on soil and vegetation characteristics, and on the savannah water budget. This project is part of the Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL). The project has three sites in Namibia, and includes CCF's farms. In 2016, data collection equipment consisting of rain gauges and soil moisture meters, as well as remote digital data transmitters were installed in previously harvested sites and current bush-encroached sites on CCF farms Cheetah View and Boskop. Both UNAM and Hamburg partners continued with field research during this reporting period, with the involvement of their graduate students and faculty members.

In 2016, CCF conducted a soil survey to study the nutrient and mineral compositions (chemical and physical properties) between harvested and non-harvested bush-encroached habitat in order to understand long-term natural regeneration and recovery of the soils and restored vegetation. A total of 15 harvested and non-harvested sites each were identified with different harvest ages for chronological sequence analysis. We collected 648 samples at various depths of the top soils in order to characterise the physical and chemical properties of soils from harvested and non-harvested sites by chemical analysis: Nitrogen (N), Phosphorus (P) and Potassium (K); percent organic matter, organic Carbon; Exchangeable cations (Calcium, Magnesium, Potassium, Sodium), cation exchange capacity (CEC); Soil PH; and Physical properties (sand, silt and clay fractions). Samples were submitted to a laboratory for data extraction. The results will be utilised as a baseline for further ecological research and monitoring of harvested sites. The findings have application to bush harvesting operations in both commercial and communal farmlands. The research will also provide necessary reference information to the public and for farmland management.

In 2016, a camera trap survey was conducted between harvested and non-harvested sites, spanning over three commercial farms owned by CCF. Twenty-six camera trap stations were operated and

replicated once per study area, yielding a total of 1,092 trap nights and 9,000 correctly identified images. The aim of the survey is to examine impacts associated with reversing bush encroachment and identify whether bush thinning enhances wildlife diversity, richness and habitat use.

4. CCF Rhino Reserve

CCF continues to monitor its 14,640-ha rhino reserve, where a small population of south-western black rhinos (*Diceros bicornis occidentalis*) resides. The rhinos are part of the Namibian Ministry of Environment and Tourism's (MET) Black Rhino Custodian Programme. A recent meeting with MET concluded that CCF's monitoring of their rhino population was very comprehensive.

CCF monitors the rhinos by deploying trail cameras across the reserve at key points that include waterholes, dung middens, game trails and roads (Figure 33). The natural waterholes were all filled up after the rains this year, and half dried up between April and December 2016. This leaves a handful of dams with a fair amount of water and three maintained troughs, ensuring that all the animals have access to water until the next rainy season. Cameras are regularly repositioned, as the rhinos' behaviour changes throughout the year. Individuals can be identified in photographs by a number of features, including ear notches, horns profiles, and hide scars. Waterhole monitoring and vehicle patrols are conducted regularly throughout the reserve. Additionally, we have made improvements to our reserve infrastructure by removing old cattle fences, bush clearing and road maintenance. Currently two of our rhinos require ear notching so they can be identified individually. This will be done in collaboration with MET next year. Our one sub-adult male is now moving around independently of his mother and looking for his own territory within the rhino reserve area, as evidenced by his presence on multiple cameras locations.

Figure 33: Examples of remote camera trap photos taken at waterholes across the rhino reserve.

As part of our on-going commitment to environmental education, all volunteers and working guests have spent time with our reserve monitoring team, learning about the behaviour, feeding habits, as well as the threats and challenges faced by the rapidly declining black rhino population. The camera trap data of the rhinos is now being entered into a data management system that will allow for student research projects to be undertaken using the data and distributions of the individual rhino can be mapped across the rhino reserve area.

H. Scientific Publications and Papers

1. Scientific Papers

Published Papers:

Buyer, J. S, Schmidt-Küntzel, A., Nghikembua, M., Maul, J.E., and Marker, L. **Soil microbial communities following bush removal in a Namibian savannah.** SOIL, 2, 101–110, 2016 www.soil-journal.net/2/101/2016/ doi:10.5194/soil-2-101-2016

Durant, S., Mitchell, N., Groom, R., Pettorelli, N., Ipavec, A., Jacobson, A.P., Woodroffe, R., Böhm, M., Hunter, L.T.B., Becker, M.S., Broekhuis, F., Bashir, S., Andresen, L., Aschenborn, O., Beddiaf, M., Belbachir, F., Belbachir-Bazi, A., Berbash, A., Brandao de Matos Machado, I.,, Breitenmoser, C., Chege, M., Cilliers, D., Davies-Mostert, H., Dickman, A.J., Ezekiel, F., Farhadinia, M.S., Funston, P., Henschel, P., Horgan, J., de Iongh, H.H., Jowkar, H., Klein, R., Lindsey, P.A., Marker, L., Marnewick, K., Melzheimer, J., Merkle, J., M'soka, J., Msuha, M., O'Neill, H., Parker, M., Purchase, G., Sahailou, S., Saidu, Y., Samna, A., Schmidt-Küntzel, A., Selebatso, E., Sogbohossou, E.A., Soultan, A., Stone, E., van der Meer, E., van Vuuren, R., Wykstra, M., and Young-Overton, K., 2016, **The global decline of cheetah *Acinonyx jubatus***

and what it means for conservation. Proceedings of the National Academy of Science - PNAS 2016; Published online before print December 27, 2016. PNAS January 17, 2017 vol. 114 no. 3 528-533 doi:10.1073/pnas.1611122114.

Nghikembua M., Harris J., Tregenza T., Marker L. **Interactions between bush encroachment and large carnivore habitat selection: a case study on GPS satellite collared cheetahs in northern Namibia.** Open Journal of Forestry, Vol.6 No.4, July 2016.

Switzer A.D., Munson L., Beesley C., Wilkins P., Blackburn J.K., Marker L. **Free-ranging Namibian farmland cheetahs (*Acinonyx jubatus*) demonstrate seronegativity for antibodies against *Bacillus anthracis*.** African Journal of Wildlife Research 46(2): 139–143 (October 2016). ISSN 2410-7220 [Print], ISSN 2410-8200 [Online] — DOI: http://dx.doi.org/10.3957/056.046.0000

Terrell, K.A.; Crosier, A.E.; Wildt, D.E.; O'Brien, S.J.; Anthony, N.M.; Marker, L.; Johnson, W.E. **Continued decline in genetic diversity among wild cheetahs (*Acinonyx jubatus*) without further loss of semen quality.** Biological Conservation. 200 (2016) 192–199.

Walker, E.H., Nghikembua, M., Bibles, B., and Marker, L. **Preference of trees as scent-posts in free-ranging Namibian cheetahs.** Global Ecology and Conservation 8 (2016) 55–57.

Woc Colburn, A.M., Murray, S., Hayek, L.C., Marker, L., Sanchez, C.R. **Cardiorespiratory effects of dexmedetomidine-butorphanol-midazolam (DBM): A fully reversible anesthetic protocol in captive and semi-free ranging cheetahs (*Acinonyx jubatus*).** Journal of Zoo and Wildlife Medicine. Accepted.

Papers in Preparation:

Fabiano E.C, Marker L, Schmidt-Küntzel A, Eizirik E. **Estimating the effective population size of the Namibian cheetah *Acinonyx jubatus*: comparison of analytical approaches and assessment of the impact of vital rate variation.**

Fabiano E.C., Nghikembua M. T., Eizirik E, Marker L.L. **Using remote camera traps for surveying and monitoring trends in abundance and density; a case study of a cheetah population in north-central Namibia.**

Fabiano E.C, Sandro B, Schmidt-Küntzel A, Marker L, Eizirik E. **Inferring the historical demography of the Namibian cheetah population using Bayesian analysis of microsatellite data.**

Fabiano, E., Vermeulen, D., Van Dieren, M., Rust, N., Marker, L. **Camera trap-based density estimates: suitability for estimating densities of non-individually identifiable species.**

Khwaja, H., Schmidt-Küntzel, A. and Marker, L. **Analysis of ovarian activity in group-housed captive female cheetahs (*Acinonyx jubatus*) using vaginal cytology.**

Marker, L, Walker, Richmond-Coggan, L. Nghikembua, M., Schmidt-Küntzel, A. **The release of captive-raised cheetahs in Namibia: management implications and lessons learned.**

McGowan, N.E., Marks, N.J., Marker, L., Schmidt-Küntzel, A., Maule, A.G., Scantlebury, M. **Determining thermoregulatory responses to exercise in cheetahs using non-invasive technology.**

Nghikembua, M., Morre, K., Bagniewska, J.M, and Marker, L. **Investigating the extent of bush encroachment within Namibia: A long-term case study of bush encroachment in the Waterberg conservancy using fixed point photography.**

Reijneker, M., Winterbach, C., Marker, L. **The effect of rainfall on herbivore population estimates from water point counts.**

Schmidt-Küntzel A, Stoneburg S, Mujaj SA, Barley SJ, Marker L. **The Common Causes of Cheetah (*Acinonyx jubatus*) Death in Captivity – A 30-year retrospective study from 1980 to 2009.** Zoo Biology. In review.

Schmidt-Küntzel, A., Williams, J., Marker, L. **A formula-based rearing method for cheetah cubs.**

Schmidt-Küntzel, A., Forsythe K., Kreijtz, S., and Marker L. **Diet of cheetah on game and livestock farms in central and north-central Namibia.**

2. Books

Marker, L., Boast, L., Schmidt-Küntzel, A. (Eds). **The Biology and Conservation of Cheetahs** (in preparation).

IV. Conservation

Whether perceived or real, livestock loss to cheetahs is an economic and emotional issue as farmers' livelihoods depend on the economic success of their livestock and wild game industries. While many Namibian farmers are very respectful of nature and tolerate a certain level of loss, some resort to lethal predator control rather than alleviating their problems in a non-lethal manner through appropriate livestock and predator management. By addressing livestock-predator conflict through a conservation management strategy that benefits both humans and cheetahs, CCF is ensuring the long-term species' survival on Namibian farms and has raised greater awareness of better farm practices.

A. Livestock Guarding Dog Programme

1. Programme Overview

CCF's Livestock Guarding Dog Programme (LGD) continues to be one of the most successful conservation projects to assist farmers with predator conflict in Namibia. To date, CCF has placed 541 (278M, 263F) Livestock Guarding Dogs with farmers throughout Namibia and other parts of Africa. As of December 2016, there were 197 (93M, 104F) dogs alive in the programme (Table 12), of which 160 (76M, 84F) are working dogs, 10 (4M, 6F) are puppies in training at CCF, and 27 (13M, 14F) are retired or housed as pets. Female SB# 240 (Tylee) has been moved from the Retired/Pet (breeding) category to the Commercial (CCF Working) category as she has been living with livestock for numerous months now. Male SB# 485 (Nesbitt) is no longer part of the LGD programme since he has been rehomed as a pet to the USA.

Table 12: Dogs alive as of 31 December 2016

Location	M	F	Total
Commercial	25	31	56
Commercial (CCF Working)	5	10	15
Commercial (CCF Puppies)	4	6	10
Communal	21	24	45
Emerging Commercial	15	9	24
Resettled	6	5	11
South Africa	1	1	2
Kenya	1	0	1
Tanzania	2	4	6
Total Working	**80**	**90**	**170**
Retired/Pet (breeding)	13	14	27
Total dogs alive:	**93**	**104**	**197**

CCF began a collaboration with the Ruaha Carnivore Project (RCP) in Tanzania in 2013, which is working to mitigate human-carnivore conflict in the Ruaha area. A large part of this conflict is driven by attacks on livestock, so CCF has provided RCP with a total of 10 (5M, 5M) puppies throughout the years to protect livestock of Maasai and Barabaig farmers. The programme has been quite successful and due to this success RCP will begin their own breeding programme in the future with one intact female provided by CCF. Unfortunately, this year, one of their male dogs that was given in 2014, John (SB# 570), died in May from an unknown illness. It was determined later that John had eaten

poisoned meat on village land. Simba (SB# 571), a male puppy also given in 2014, died in 2015 from a car accident, but CCF was only informed in 2016. Duma (SB# 577), a female given in 2014, was removed as a working dog due to an eye issue that was hindering her working skills. As the programme is still growing, CCF hopes to send more puppies over in the future.

CCF has also donated numerous puppies over the years to Cheetah Outreach, another facility who works to save the wild cheetah in South Africa, to help form their own livestock guarding dog programme. Since the trial programme was so successful in 2005, they also began breeding and providing Anatolian shepherds to farmers after the CCF model. The programme is key in helping farmers protect their livestock and thus save more cheetahs.

Currently, there are 20 (6M, 14F) intact dogs in the programme (Table 13), of which 9 (2M, 7F) reside at CCF as working dogs, seven (3M, 4F) work on commercial farms, one female is a pet, two (1M, 1F) are in South Africa, and one female is in Tanzania. Six dogs were removed from the intact dog category as follow:

- SB# 287 (Penda) was sterilised on 15 January 2016.

- SB# 468 (Kandake) died 27 December 2015 after being hit by a car and killed, the owners were on holiday when it occurred so CCF was not informed until 2016.

- SB# 458 (Nahla) was euthanized on 24 September 2016 due to Addison's disease (see section 3, Follow up on Prior Placements).

- SB# 485t (Nesbit) was sterilised after finding out he was sterile and was re-homed as a pet in the USA.

- SB# 285 (Amos) has been retired from the breeding programme as he is sterile.

- SB#382 (Hediye) was sterilised after being diagnosed with a pyometra, an infection in the uterus, and hormonal treatment did not resolve the issue.

For more information on Nesbitt (SB# 485), Amos (SB# 285), and Hediye's (SB# 382) cases, see section 4, Dog Health.

Four additions to the intact dog category include:

- SB# 628 (Susie), was placed on a commercial farm as a working and future CCF breeding dog.

- SB# 658 (no name yet) was placed as a pet to Kandake's (SB# 468) family for future breeding.

- SB# 664 (Ray) has been kept at CCF as a working and breeding female.

- SB# 660 (Bolt) was imported from Texas, USA on 11 August 2016. His parents were brought over from Turkey to the USA making him a fresh bloodline.

Table 13: Intact livestock guarding dogs as of 31 December 2016

SB#	Dog Name	Born	Sex	Working/Pet	Farm Type	Country
277	Uhtaya	9/30/2004	M	Pet	N/A	South Africa
324	Wagter	9/18/2007	M	Working	Commercial	Namibia
392	Tiny	6/29/2009	F	Working	Commercial	Namibia
423	Max	end Jan-10	M	Working	Commercial	Namibia

451	Kiri	2/10/2010	F	Working (CCF)	Commercial	Namibia
424	Aleya	7/5/2010	F	Working (CCF)	Commercial	Namibia
405	Pandora	8/5/2010	F	Pet	N/A	South Africa
431	Firat	8/31/2010	M	Working (CCF)	Commercial	Namibia
456	Kaspaas	2/1/2012	M	Working	Commercial	Namibia
487	Lady	2/17/2013	F	Working	Commercial	Namibia
490	Taya	2/17/2013	F	Working (CCF)	Commercial	Namibia
498	!Us	4/2/2013	F	Working	Commercial	Namibia
507	Repet	4/11/2013	F	Working (CCF)	Communal	Namibia
524	Karibib	2/10/2010	F	Working (CCF)	Commercial	Namibia
535	Lady	9/10/2012	F	Working (CCF)	Commercial	Namibia
579	Busara	10/3/2014	F	Working	Communal	Tanzania
628	Susie	11/11/2015	F	Working	Commercial	Namibia
660	Bolt	5/20/2016	M	Working (CCF)	Commercial	Namibia
658		7/9/2016	F	Pet	N/A	Namibia
664	Ray	8/26/2016	F	Working (CCF)	Commercial	Namibia

The LGD programme is a crucial part in CCF's mission to conserve the wild cheetah and its continuing success is due to the efforts of dedicated CCF staff. Gebhardt Nikanor has worked on the programme since he joined CCF over 10 years ago. Paige Seitz arrived in December 2013 to manage the programme.

2. Breeding and Puppy Placements

Since the programme's inception, 69 litters have been born at CCF for a total of 585 (283M, 287F, 15U) puppies (Table 14). From January to December 2016, a total of 44 (16M, 28F) puppies were born to five of CCF's breeding females. From these litters, 5 (3M, 2F) puppies were stillborn and one female puppy died two days after birth. The 10 (4M, 6F) puppies from Karibib's December 2016 litter are still at CCF and will not be placed until February 2017.

Table 14: Puppies born and type of placement as of 31 December 2016 (K = Commercial Farm; C = Communal Farm; EG = Emerging Commercial Farm; R = Re-settled Farm; P/B = Pet/Breeder; D = Dead; NP = Not Placed; IP = Intact Puppies)

Sire/Dam	431/524		431/535		431/451		431/424		431/490		431/524		**Totals**	
DOB:	11Nov'15		25Apr'16		23May'16		9Jul'16		26Aug'16		19Dec'16			
Sex:	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
K	3	1	1	1	2	1	0	3	0	1	0	0	**6**	**7**
C	1	2	1	4	0	1	2	2	2	1	0	0	**6**	**10**
EC	1	0	0	1	0	0	0	1	1	0	0	0	**2**	**2**
R	0	0	0	0	0	1	0	0	0	1	0	0	**0**	**2**
P/B	0	0	0	0	0	0	0	1	0	0	0	0	**0**	**1**
D	0	0	2	1	1	0	0	0	0	0	0	2	**3**	**3**
NP	0	0	0	0	0	0	0	0	0	0	4	6	**4**	**6**
Total	**5**	**3**	**4**	**7**	**3**	**3**	**2**	**7**	**3**	**3**	**4**	**8**	**21**	**31**
IP	0	1	2	0	1	3	0	1	0	1	4	6	**7**	**12**

- Karibib (SB# 524), a Kangal imported from Germany and no longer needed at her owner's farm, was given to CCF as a breeding dog. She was bred with our Kangal male, Firat (SB# 431), for the

second time. On 11 November 2015, she gave birth to 8 (5M, 3F) healthy puppies. These puppies were placed on their farms in January and February 2016. One (1M) was placed on an emerging commercial farm, two (1M, 2F) puppies were placed on communal farms, and four (3M, 1F) were placed on commercial farms. One (1F) SB# 628, was placed on a commercial farm and kept intact for future breeding.

- Lady (SB# 535), an Anatolian from South Africa given to CCF when she was no longer needed by her owner, was bred with our Kangal male, Firat (SB# 431) for the first time. She gave birth on 25 April 2016 to 11 (4M, 7F) puppies. The last three (2M, 1F) puppies born were stillborn (SB# 632, 633, and 640). The necropsies confirmed the puppies never took a breath. No other conclusions could be drawn from the necropsies, although with first-time mothers, stillborn puppies are not uncommon. The mother can become tired from contracting and become too relaxed and not be able to push the puppies out herself. She was given Oxytocin to help create contractions and push the last three puppies out. The eight remaining puppies were placed in July 2016. One (1F) was placed on an emerging commercial farm, five (1M, 4F) puppies were placed on communal farms, and two (1M, 1F) puppies were placed on commercial farms.

- Kiri (SB# 451), a Kangal imported from Germany by her owner and brought to CCF for breeding purposes in 2012, was bred to our Kangal male Firat (SB# 431) for the fifth time. She successfully gave birth to a litter of 6 (3M, 3F) puppies on 23 May 2016. One puppy (1M, SB# 643), was stillborn. The necropsy confirmed the puppy never took a breath; however, no other conclusions could be drawn from the necropsy. During whelping, Kiri was given Oxytocin (.5mL) to help create contractions and help push out the fifth puppy as it had been over four hours and we knew there was another puppy inside. Subsequently, we felt as though there was still one more puppy so she was given another .5mL of Oxytocin, but no contractions occurred. The vet gave her two more doses (.5mL) of Oxytocin to make sure everything was out and still no contractions occurred and she was relaxing, which made us assume all puppies were out. The next morning a stillborn was found under her body when she was coaxed with food to move so her whelping area could be cleaned. The five remaining puppies were placed on their farms in August 2016. One (1F) puppy was placed on a communal farm, one (1F) was placed on a resettled farm, and three (2M, 1F) were placed on commercial farms.

- Repet (SB# 507), a Mongretolian, was bred in mid-April to our Anatolian male, Nesbitt (SB# 485), for the first time. Unfortunately, a few days later, pus was seen in Repet's vulva. She was treated with a course of Baytril which cleared up the infection; however, she did not become pregnant. Later it as found that Nesbitt (SB# 485) was sterile.

- Aleya (SB# 424), a Kangal imported from Germany, was bred for the fifth time with our Kangal male, Firat (SB# 431). She gave birth to 9 (2M, 7F) healthy puppies on 9 July 2016. These 9 puppies were placed on farms in September 2016. Three (3F) were placed on commercial farms, four (2M, 2F) were placed on communal farms, one (1F) was placed on an emerging commercial farm, and one (1F, SB# 658) was placed as a pet to use for future breeding.

- Taya (SB# 490), a Namibian born Anatolian, was bred for the second time with our Kangal male, Firat (SB# 431), in June 2016. She gave birth to 6 (3M, 3F) healthy puppies on 26 August 2016. These six puppies were placed on farms in November 2016. Three (1M, 2F) were placed on communal farms, one (1M) was placed on an emerging commercial farm, one (1F) was placed on a resettled farm, and one (1F, SB# 664) was kept intact and at CCF for future breeding.

- Hediye (SB# 382), a Kangal imported from Texas, USA, was artificially inseminated (AI) in mid-June 2016 with sperm from our male Kangal, Firat (SB# 431) as natural breeding was not

occurring. Unfortunately, she developed a pyometra and had to be sterilised. For more information on this procedure see section 4, Dog Health.

- Karibib (SB# 524) was bred with our Kangal male, Firat (SB# 431), for the third time. She gave birth to 12 (4M, 8F) puppies on 19 December 2016. One (1F, SB# 678) was a stillborn. The necropsy showed that the puppy never took a breath, but no other conclusions could be determined. One (1F, SB# 677) died two days after being born; we believe Karibib laid on her by mistake. The other 10 puppies will not be placed until February 2017.

The farmers receiving puppies participated in CCF's mandatory one-day course 'Puppy Information Day', where the farmers are trained on the correct methods of raising a livestock guarding dog. The courses cover care and training of livestock guarding dogs, as well as predator-friendly livestock management.

3. Follow-up on Prior Placements and Health Survey

Before any dog is placed on a farm in Namibia, CCF conducts a pre-approval farm visit to ensure that the farm has the facilities and capabilities to ensure the health and wellbeing of the dog, and that it can provide the right conditions for the dog to succeed as a livestock guarding dog. After a puppy is placed, CCF performs follow-up visits at three, six, nine and 12 months of age, and then yearly, to ensure the health and success of each dog. When dogs are found to be unhealthy or not doing their job, they are removed from that specific farm, evaluated, and placed on another farm if deemed pertinent or placed as pets if they are no longer able to work as livestock guarding dogs due to health or behavioural problems.

From 1 January 2016 to 31 December 2016, CCF staff visited 193 (98M, 95F) dogs, this number includes dogs counted multiple times because they have been visited several times throughout the year to complete their required 3-month, 6-month, and 1-year visits or follow-up visits. Of the 193 dogs, 30 (15M, 15F) received their one-year of age visit. The dogs were vaccinated against rabies and other canine diseases, had an overall health check, and were evaluated on their working success. The following are some outcomes and findings from the visits:

- Spots (SB# 413), one of CCF's working male dogs, was given on 2 December 2015 to Harry Erasmus, a commercial farmer in Dordabis who was having severe problems with predators. This farmer received a puppy (SB# 628) from Karibib's litter in late January 2016 and Spots stayed until 9 May 2016 to help train the puppy. The new puppy is working well and Spots is busy helping to protect CCF's herd again.

- Max (SB#453) was visited in May 2015 and was still working. Later in the year the dog became a pet dog. This could possibly be from an old issue with his legs as they are extremely straight and cause him to have problems walking. CCF was informed when we called to schedule a visit in May 2016.

- Cheetah (SB# 516), a working dog on a resettled farm, is now considered a pet dog since July 2015. The dog was still working during our last visit in June 2015; however, the owner informed us he was no longer working when we called to schedule a visit in April 2016.

- Tjevera (SB# 371), a working dog on an emerging commercial farm, died from an unknown sickness in September 2015. CCF was informed when we called to schedule a farm visit in 2016.

- Otjitotongwe (SB# 352), a working dog on a commercial farm, died from old age in September 2015. CCF was informed when we called to schedule a farm visit in 2016.

- Ferra (SB# 327), a working dog at an emerging commercial farm, died from old age in September 2015. CCF was only informed in 2016 when we called to schedule a farm visit.

- Kandake (SB# 468), a working dog on a commercial farm and a CCF breeding dog, was hit and killed by a car on 27 December 2015. The owners were on holiday and were not able to inform CCF until January 2016.

- Flekkie (SB# 436), a working dog on an emerging commercial farm, died in January 2016 from a suspected snake bite. CCF was informed when we called to schedule a farm visit in October 2016.

- Tiger (SB#587), a working dog on a commercial farm, is now considered a pet since 29 January 2016 as she does not seem to have the drive to work.

- Looker (SB#589), a working dog on a commercial farm, was returned to CCF on 20 January 2016 as he was causing issues with the sheep he was working with. He was isolating two sheep from his herd and not allowing them to return to the herd while out in the *veld*. He also had killed some of the lambs. The owner asked CCF to pick the dog up as he didn't feel that his staff was reliable enough to take on this issue. CCF revaluated the dog and he seemed to work fine with our sheep, but to guarantee no issues we provided him to a farmer who only has goats. He was rehomed on 24 February 2016 and is working fine on his new emerging commercial farm.

- Sheperd (SB# 418), a retired working dog at CCF, was found dead in the *kraal* on the morning of 21 January 2016. He had chronic issues due from a previous Ehrilichiosis infection, but even after a necropsy CCF is unsure what caused his death.

- Cheetah (SB# 488), a working dog on a communal farm, was taken to the vet in the beginning of February 2016 as he was ill. The vet diagnosed him with tick bite fever and he was recovering at the owner's house. On 20 March 2016, he began coughing up blood and passed away from unknown causes.

- Diesel (SB# 479), a working dog on a commercial farm, was returned to CCF on 4 February 2016 as the owner had to sell her livestock. He was brought to CCF and revaluated as he hadn't worked in some time, but he proved to enjoy working. He was rehomed to a commercial farm on 19 March 2016, but unfortunately that situation did not fit well with Diesel. He was then transferred to an emerging commercial farm on 14 April 2016 and is said to be working very well.

- Maria (SB#598), a working dog on a commercial farm, was returned to CCF on 10 February 2016 as the owner's herder had stolen half of his livestock and the owner was forced to sell the rest of his livestock. He no longer needed the dog and wanted us to provide her to another farmer in need. She had no behavioural issues and was in perfect condition so she was rehomed immediately to another commercial farm on 12 February 2016. She is working well on her new farm.

- Cheetah (SB# 614), a working dog on a resettled farm, was confiscated on 11 February 2016 due to poor care. She was brought back to CCF with bad tick wounds. She was tested for Erhlichiosis, tick bite fever, and was positive. She was treated for both her wounds and illness. After a long recovery, she was rehomed as a working dog on a communal farm on 19 April 2016 and is said to be working well. For more information on her case look under section 4, Dog Health.

- Jackie (SB# 558), a working dog on a commercial farm, was returned to CCF on 15 February 2016 as she was not working properly and had urination problems. She was taken to the vet in early 2016 and was recovering from tick bite fever at the owner's house, when the owner noticed urine leaking from her while she sat. When Jackie arrived at CCF we examined her and determined that her bladder sphincter may not be strong enough to stay closed while she sits. We decided to place her as a pet as she did not seem driven to work. She was rehomed as a pet on 25 April 2016 and the family loves her mild temperament and that she gets along well with their other dogs. Unfortunately, on 30 September 2016 Jackie passed away. She was thought to have been stung by something a week earlier and was treated with a cortisone injection and was improving. However, over the next few days she decreased in health and was taken to the vet. Though unsure of what exactly happened, it was apparent that something had gotten in her lungs and damaged them as she had blood presence in them. From treatment at the vet, she seemed to be improving, but unfortunately, she did not make it.

- Bruno (SB# 442), a working dog on a commercial farm, ran off and did not return to his farm. He was presumed dead in March 2016. CCF was informed when we called in July 2016 to schedule a farm visit.

- Rocket (SB# 596), a working dog on a communal farm, died from a suspected snake bite on 20 March 2016. The farmer is interested in a new dog.

- Dollar (SB# 280), a dog that was confiscated and living permanently at CCF, was euthanized on 3 April 2016 due to cancer in his left hip. The effects of the cancer came on very quickly and it grew more painful each day.

- Duma (SB# 326), a working dog at CCF's herder's, Armas Shanika, commercial farm, was brought back to the main centre on 17 April 2016 as he wasn't working properly. Armas received a second dog from CCF, but as he did not want Duma affecting his new dog's working success, Duma was rehomed as a pet dog on 12 November 2016 to the same family that took Kenda (SB# 545) (see below). The family says he only moves when it gets cool out and sometimes even plays with the other dogs.

- Hitler (SB# 585), a working dog on a communal farm, was hit and killed by a car in May 2016. CCF was informed in October 2016 when we called to schedule a farm visit.

- Murize (SB# 509), a working dog on a communal farm, was hit and killed by a car on 2 May 2016.

- Cecil (SB#591), a working dog on a commercial farm, was euthanized on 8 May 2016 due to colon cancer that had spread to his liver and lymph system. He stopped eating and was losing weight so he was taken to the vet, there they found the cancer. The owners are interested in another dog.

- Ngaihupe (SB# 601), a working dog on a resettled farm, is now considered a pet since 20 May 2016 as he is reluctant to follow the herd despite all efforts.

- Cheetah (SB# 567), a working dog on a communal farm, was confiscated on 15 June 2016. The owner had sold his livestock and left the dog with his mother's herd. The mother unfortunately could not afford to feed the dog. Despite poor diet, the dog was in decent condition, and was rehomed to a commercial farm on 18 June 2016.

- Sheperd (SB#563), a working dog on a commercial farm, was killed by a snake bite in July 2016.

- Fire (SB# 625), a working dog on a commercial farm, ran off with a mongrel on 20 July 2016. The farmer informed the police and all his neighbours about the missing dog. Thanks to the help of his neighbours, the dog was returned on 6 August. Unfortunately, he died from unknown causes on 23 August 2016. The dog was seen foaming from the mouth, running around confused, and then fell over and passed away. There is a possibility of rabies, but he showed no other signs of rabies beforehand. The CCF vet believes he may have choked as the signs can look very similar to rabies and all the other dogs at the farm are healthy. Due to the farmer's dedication and desire to use a CCF dog as protection for his livestock, he received a rehomed dog, Kunene (SB# 637), in October 2016.

- Kenda (SB# 545), a working dog on a commercial farm, was brought to CCF on 26 July 2016 as she wasn't working and may have been hunting. She would disappear for hours at a time and was found aside of a dead kudu. Being a Mongretolian, which is smaller dog, she could not take down a full-grown kudu herself. They are unsure if she would have eaten the kudu or not as they arrived at the scene before she could do anything. To prevent any hunting behaviour in the future, she was rehomed as a pet dog on 12 November 2016 to the same family taking Duma (SB# 326). She gets along well with their other adopted hound mix and they play together all the time.

- Maria (SB# 417), a rehomed working dog at a resettled farm, became a pet on 29 September 2016. The farmer said this year she has run to a neighbouring farm about four times, which he believes is due to his former herder taking her with him to the farm regularly. Despite this bad behaviour, Maria proved herself on 29 July 2016, when she protected the herd and other dogs against a troop of baboons. Unfortunately, she and the other dogs were seriously injured from the fight. The farmer treated her wounds and gave her antibiotics, but she received a permanent injury to her right hind leg. As a result, she cannot keep up with the herd, but the farmer will keep her as a house dog as he said, "She knows him so well". He is interested in another dog as he has used our dogs for livestock protection for numerous years.

- Bruno (SB# 575), a working dog on an emerging commercial farm, died from a snake bite in August 2016. The farmer received a new puppy from Taya's 2016 litter as he took good care of his dog and was satisfied with the protection his dog provided to his herd.

- Gabes (SB# 494), a working dog on a commercial farm, is now considered a pet since 9 September 2016 as he might have been hunting. The owners did not want to take the chance of anything happening so they took him as a pet.

- Nahla (SB# 458), a pet dog and CCF breeding female, was euthanized on 24 September 2016 due to suffering from Addison's disease. This disease is rare and results from the reduction of corticosteroid secretions from the adrenal gland, which is necessary in the function of the body. The effects of the disease came very rapidly with no warning.

- Bruno (SB# 651), a working dog on a communal farm, was brought in to CCF due to an injury to his abdomen on 11 October 2016. The workers at the farm had taken the goat kids out and left Bruno in the kraal, Bruno wanted to be with his goats so he tried to jump the fence and impaled himself with a stick. He was taken to the state vet by the farmer, but they didn't do much for him. The farmer was told to bring him back in a few days to stitch the area. We happened to be doing his 3-month visit at the time and decided to bring him to CCF to make sure the injury healed properly, in a clean area where he could stay calm. Since the farmer did the right thing by taking him to a vet, we wanted to make sure his puppy would be able to go back to his farm to continue working. Bruno was returned to the farmer on 28 October 2016 after his wound had

healed to a point that we did not worry about it opening up again. He is said to be working well and will be checked on in January 2017.

- Kunene (SB# 637), a working dog on a communal farm, was confiscated due to poor nutrition on 13 October 2016. She was not malnourished, but was not fed a proper diet and this is very important for young pups' development. We did not believe the farmer would switch to a proper diet upon our request so she was removed. Since she was not in very poor condition, she was kept at CCF for a few days then rehomed to a commercial farm as a working dog on 21 October 2016. When dropped at her new farm, she immediately laid down with the goats and is said to be doing well. She will be visited in January to evaluate her success and condition.

- Kaspaas (SB# 456), a working dog and CCF breeding male on a commercial farm, was brought to CCF on 17 October due to an illness. The owner had called saying the dog hadn't followed the herd in a few days, wasn't eating, and was seen vomiting. Upon arrival at CCF, the dog seemed full of energy and ate his meal right away, although he did have diarrhoea. A faecal test was completed and was negative. We believe he got in to something that upset his stomach as his breath also smelled bad when he burped. He was given paraffin oil to help get anything out that may still be upsetting his stomach and was kept for a few days until his faeces became more normal. A few days into his stay at CCF, tape worm segments were seen on his anus. This had not shown up during the time the faecal was collected. He was treated with de-wormer and returned to his farm on 20 October, once he began to defecate normally. A few days later the farmer said he was back to his normal self and working well.

- Johnny (SB# 561), a working dog on a resettled farm, was confiscated on 24 October 2016 due to extreme malnourishment. His original owner was not taking proper care of him so the father of the owner took him to his farm. When we did his annual visit, the father told us he would keep the dog and care for him. Due to his poor condition, we scheduled a follow-up visit to see if he was improving, but no improvements were observed so he was removed. He received proper care at CCF and was revaluated on his working success. He gained back all his weight and still had a very strong working drive. He was rehomed as a working dog on a communal farm on 12 December 2016. This farm belongs to a woman that has another CCF working dog, but wanted a second dog for her goat herd. Johnny will be re-visited in January to check on his condition and working success.

- Office (SB# 593), a working dog on a communal farm, was removed on 24 November 2016. CCF was called in early November by the farmer to say that the dog had not been working since May 2016 despite all efforts. This problem might have developed after our visit the same month. Office and the other dogs at the farm had developed mange, which the farmer began treating a week before the dog was retrieved. Office was separated from CCF dogs for three weeks after a treatment of Bravecto for his mange to no longer be contagious. We are now in the process of re-evaluating his working success as there is a possibility that he can work again on a new farm. So far, he is working well and shows lots of excitement to go out with the herd.

Other than routine vaccinations, CCF provides de-worming tablets, veterinary supplies for minor injuries, and topical anti-parasitic agents that are available from donations. The medical supplies ensure that the dogs' health is a priority. Dog food is offered for purchase at a discounted rate to the farmers to encourage that a correct diet is followed consistently. The dogs' working success has been correlated with good care from the owner. Many farmers are part-time and thus their attention is divided between their farm and other business activities; however, this is not a problem if they have good herders who assist with livestock and dog care. It is important that the owners are in touch with the developmental phases of their dogs so that problems can be dealt with immediately as they occur, preventing bad habits from developing and the dog failing as a result.

4. Dog Health

All CCF's Anatolian shepherd and Kangal dogs, as well as the scat-detection dogs, are enrolled in a preventative medicine programme. Every month, a broad-spectrum anti-parasite product for endoparasites is administered. The product utilised is rotated continually to help prevent development of resistance. Every four weeks an ectoparasite prevention product is applied topically to prevent fleas, ticks, and mites. Each dog receives vaccinations annually against canine distemper virus, canine parvovirus, adenovirus, parainfluenza virus, and rabies virus. Each month every dog is weighed to make sure they are at a healthy body weight.

This June 2016 to July 2016, a first-year vet student from Cornell University (USA), Zachary Dvornicky-Raymond, who has experience with dog reproduction, came to CCF to look at some of the issues that were experienced with our breeding colony.

The biggest project Zack worked on was to try and get Hediye (SB# 382) in to a heat cycle so she could be bred, since she had still not come in to heat since July 2015. This was completed by giving her Cabergoline, a drug that can be used to induce oestrus in female dogs. She received 1/8th of a pill once a day until she came into heat and reached the stage of oestrus. She was swabbed every other day to keep track of her cycle until she reached oestrus and then she was swabbed daily. Once she reached oestrus she was placed in a pen with our male Kangal, Firat (SB# 431), for breeding. Unfortunately, he seemed to show little interest and then when he did show some interest, she did not allow copulation. It was decided to perform artificial insemination (AI) on her using Firat's (SB# 431) sperm. This procedure was completed five times. Unfortunately, 11 days after her last AI session, she began not eating and acting depressed. It was discovered that she had developed a pyometra. Since Hediye is a valuable breeding dog we tried using hormonal treatment, but the treatment was not successful and she had to be sterilised on 19 July 2016. Hediye remains at CCF to help guard livestock.

Zack also looked at sperm collection and fertility in our male dogs. The goal with sperm collection of the breeding males was to make sure each male was producing sperm, due to some of our female dogs not getting pregnant even when copulatory tying was observed. Our main concerns were Nesbit (SB# 485), 3 years old, who has never produced a litter despite breeding with two females, and Amos (SB# 285), 11 years old, who has not produced a litter since 2014 despite breeding with a female in 2015. Firat (SB# 431), 6 years old, has always successfully bred with females, therefore his sperm was collected for comparison to the other two males. Each male was collected numerous times.

There are three fractions in sperm collection; the first and third fraction are not rich in sperm. The second fraction contains most of the sperm and is the fraction that is collected and analysed. During Firat's (SB#431) collections, fractions 1-3 were observed; his collections contained lots of sperm. During Amos's (SB# 285) collections, fractions 1-3 were observed; his collections contained no sperm, but lots of bacteria/debris. During Nesbit's (SB# 485) collections, only fraction 1 and 3 were observed; his collections contained no sperm.

Sperm was continually collected until Zack left in late July. From the data gathered it was found that Nesbitt (SB# 485) and Amos (SB# 285) were sterile. Nesbitt (SB#485) has been rehomed as a pet in the USA and Amos (SB# 285) has been retired from the breeding programme, but remains at CCF.

As to the pseudo-pregnancies Repet (SB# 507) was experiencing, it was also determined that they may have occurred due to the males not producing sperm, meaning her eggs were never fertilised, but since the action of mating was completed her body acted as though she was pregnant.

On 7 September 2016, Uschi (SB# 269) seemed lethargic and hadn't eaten for the last few days. A blood smear was taken to see if she could have a reoccurring case of tick bite fever. The blood smear showed some bacteria so she was started on Doxycycline for seven days to see if she would improve. X-rays were taken to check for any other issues as she is an old dog. The X-rays revealed a lot of fluid around her heart, which explained her symptoms. Blood work was sent in to Pathcare for analysis. She had elevated levels of Urea, P, ALP, and ALT. To help reduce the effects of her heart failure, she was given an injection of Furosemide (10mg), put on Enalapril (20mg) for 14 days, and put on Pimobendan (10mg) for 14 days. She seemed to become livelier, was slowly regaining her appetite, and new X-rays showed that the fluid around her heart had decreased. She will remain on those medications for the rest of her life and will need continuous X-rays and blood work analysis to make sure her heart failure is under control. Unfortunately, she has had to be retired from going out with the herd, but she still lives with and protects the livestock.

B. CCF Model Farm

CCF's farm provides the opportunity to practice and experiment with optimal methods of livestock and non-lethal farm management practices, especially acting as a showcase model of success. CCF's cattle, goat, and sheep herds continue to increase and selected herds have been used during various Farmer Training programmes. Table 15 provides an overview of CCF's livestock.

Table 15: CCF cattle and livestock from January to December 2016.

	Stock Start	Born	Purchased	Sold	Died	Slaughtered/ CCF use	Stolen	Stock End
Cattle	**434**	148	0	124	3	0	0	**455**
Boer Goats	**139**	71	0	37	9	0	0	**164**
Damara Sheep	**127**	76	0	59	7	3	0	**134**
Dairy Goats	**129**	80	4	55	6	0	0	**152**
Donkeys	**23**	3	187	0	17	157	0	**39**
Horses	**21**	2	24	0	6	29	0	**12**

CCF's Farms Manager, Johan Britz; Large Stock Assistant Manager, Bessie Simon; Small Stock Manager, Tyapa Toivo; Small Stock Herder, Armas Shanika; and the animal health team carry out proper management to maintain the general health and welfare of the animals.

During this period, CCF farm staff continued to work on fence repairs and basic farm maintenance. Work also continues on firebreaks, road maintenance, as well as weed control and eradication of alien species.

1. Cattle

CCF cattle are managed in a 100% predator-friendly environment. A cow-calf system is in place and weaners are sold before one year of age based on market conditions. Factors such as severe bush encroachment continue to be a challenge. Another below average rain season (280mm) was experienced for the first semester of 2016. The new rainy season at the end of 2016 had a very slow start on most CCF land and continued to be poor.

Normal management is done in coordination with nature, therefore mating seasons differ yearly but generally happen from January to the end of April. This period can be extended since CCF only owns four bulls instead of the usual 12 to 15 bulls. However, when necessary, CCF utilises six to eight bulls

that are on loan. Pregnancy determination is normally done in July or August. Dehorning and castration are done as needed during the calving season.

By 31 December 2016, CCF had 455 cattle compared to 434 at the end 2015. Total cattle production for 2016 included 148 calves born (85M, 63F), and 124 sold (63 cows, 38 heifers, 9 female calves and 14 male calves). CCF also rents grazing land to two farmers for their cattle (approximately 700 heads), thus providing an extra income.

Vaccination Programme

CCF firmly believes in farming with animals adapted to the Namibian climate with a strong natural resistance to most diseases. As such, unnecessary vaccinations are avoided to minimise costs and reduce stress on the animals. Compulsory brucellosis and anthrax vaccinations are administered and other vaccinations are done purely as needed. Periodical internal and external parasite control is also in place.

Other

Since cattle falls under the Fanmeat scheme of Namibia, CCF must ensure compliance with the European Union (EU) and the Fanmeat scheme. Fanmeat stands for Farm Assured Namibian Meat, which is a standard for meat production, specifically for cattle, that involves the traceability, animal health and welfare, record keeping, and animal movement in Namibia. The CCF cattle recordkeeping and data have passed inspection every year, and our cattle operation is mentioned by the Directorate of Veterinary Services as an excellent standard when it comes to the fulfilment of these requirements.

2. Small Stock

Goats and sheep are an essential part of CCF's LGD programme as the puppies must be raised amongst the goats and sheep for them to form a close bond with the livestock. As part of CCF's Model Farm, dogs and small stock are used during farmer-training programmes as a method to raise livestock around predators without using lethal methods to prevent predation.

In addition to the 12 Anatolian shepherd and Kangal dogs mentioned in the previous section, as of December 2016, the kraal contains 152 (9M, 98F, 44 wethers) dairy goats, 164 (0M, 138 F, 27 wethers) Boer goats, and 134 (1M, 91F, 42 wethers) Damara sheep.

CCF staff continued to work on increasing the amount of shade and rain protection for the goats. All the bucks have been moved to the newly constructed pens at Bynadaar.

Boer Goats

From January to December 2016, a total of 71 Boer kids were born (Table 16).

Table 16: Boer goat births from 1 January 2016 to 31 December 2016.

Studbook #	Sex	DOB	Dam	Sire	Dead/Alive
431	cM	3-Jan-16	233	263	Alive
432	F	3-Jan-16	246	263	Alive
433	cM	7-Jan-16	81	263	Alive
434	cM	7-Jan-16	81	263	Alive
435	cM	9-Jan-16	196	263	Dead

436	cM	9-Jan-16	179	263	Alive
437	F	9-Jan-16	179	263	Alive
438	F	9-Jan-16	65	263	Alive
439	cM	11-Jan-15	65	263	Alive
440	F	11-Jan-15	67	263	Alive
441	F	11-Jan-15	220	263	Alive
442	F	11-Jan-15	212	263	Dead
443	cM	30-Aug-16	332	263	Alive
444	F	30-Aug-16	332	263	Alive
445	cM	31-Aug-16	330	263	Alive
446	F	31-Aug-16	330	263	Alive
447	F	31-Aug-16	347	263	Alive
448	cM	31-Aug-16	305	263	Alive
449	F	31-Aug-16	305	263	Alive
450	F	31-Aug-16	269	263	Alive
451	F	31-Aug-16	269	263	Dead
452	F	31-Aug-16	155	263	Alive
453	F	31-Aug-16	155	263	Alive
454	cM	1-Sep-16	335	263	Alive
456	cM	1-Sep-16	260	263	Alive
457	F	1-Sep-16	260	263	Alive
458	F	1-Sep-16	306	263	Alive
459	cM	2-Sep-16	240	263	Alive
460	F	2-Sep-16	240	263	Alive
461	cM	2-Sep-16	280	263	Alive
462	F	2-Sep-16	263	263	Alive
463	F	2-Sep-16	263	263	Alive
464	cM	2-Sep-16	325	263	Alive
465	F	2-Sep-16	325	263	Alive
466	F	3-Sep-16	322	263	Alive
467	cM	3-Sep-16	279	263	Alive
468	F	3-Sep-16	279	263	Alive
469	F	3-Sep-16	279	263	Alive
470	F	3-Sep-16	317	263	Alive
471	cM	3-Sep-16	317	263	Alive
472	cM	3-Sep-16	268	263	Alive
473	cM	4-Sep-16	281	263	Alive
474	F	4-Sep-16	281	263	Alive
475	F	4-Sep-16	251	263	Alive
476	F	4-Sep-16	251	263	Alive
477	cM	4-Sep-16	257	263	Alive
478	F	5-Sep-16	257	263	Alive
479	cM	5-Sep-16	245	263	Alive
480	F	5-Sep-16	245	263	Alive
481	cM	6-Sep-16	283	263	Alive
482	F	6-Sep-16	283	263	Alive

483	F	7-Sep-16	253	263	Alive
484	F	7-Sep-16	253	263	Alive
485	cM	8-Sep-16	261	263	Alive
486	F	8-Sep-16	261	263	Alive
487	cM	8-Sep-16	227	263	Alive
488	F	8-Sep-16	227	263	Alive
489	M	8-Sep-16	221	263	Alive
490	F	8-Sep-16	336	263	Alive
491	cM	10-Sep-16	152	263	Alive
492	F	10-Sep-16	308	263	Alive
493	M	10-Sep-16	246	263	Alive
494	cM	10-Sep-16	220	263	Alive
495	F	10-Sep-16	265	263	Alive
496	cM	13-Sep-16	69	263	Alive
497	F	13-Sep-16	69	263	Alive
498	cM	15-Sep-16	247	263	Alive
499	cM	15-Sep-16	247	263	Alive
500	cM	16-Sep-16	224	263	Alive
501	cM	16-Sep-16	224	263	Alive
502	cM	18-Sep-16	328	263	Alive

From January to December 2016, 9 Boer goats died due to different causes (Table 17).

Table 17: Boer goat deaths from 1 January 2016 to 31 December 2016.

Studbook #	Sex	Date of Death	Cause of Death
SB# 56	Female	4-Jan-16	Old age. Euthanized
SB# 435	Male	20-Jan-16	Under-developed respiratory system
SB# 442	Female	15-Jan-16	Fractured rib cage
SB# 300	Female	29-Jan-16	Broken collar bone
SB# 238	Female	5-Jan-16	Broken left thigh
SB# 212	Female	15-Aug-16	Drowned In drinking water trough
SB# 485	Female	16-Sep-16	Suffocated by Dam
SB# 465	Castrated male	20-Sep-16	Suffocated by Dam
SB# 451	Female	22-Nov-16	Hypoalbuminemia Nutritional Deficiency
SB# 155	Female	22-Nov-16	Severe anaemia and diarrhoea; declining condition. euthanized

CCF's Boer goats are managed for meat production and castrated males and old or inferior does are sold at the auction. Between January and December 2016, 31 Boer goat wethers and 6 old does were sold. No Boer goats were purchased.

CCF's strategy is to keep improving on the quality of its Boer herd by bringing in quality bucks and continuing to improve the selection of animals for breeding. This will provide more income from the sales of these goats, as some can be sold as breeding animals versus only meat.

Damara Sheep

The Damara sheep herd stood at 134 (1M, 91F, 42 wethers) at the end of this reporting period, up from 127 at the end of 2015.

From September 2015 to mid-November 2015, 70 sheep were bred and finished lambing by April 2016. From January to June 2016 a total of 63 ewes gave birth, with a conception rate of 90%. In total 76 (49M, 27F) lambs were born, including one stillbirth (SB# 332) and one (SB# 403) which died shortly after birth (Table 18). Sixty-three ewes were bred again between September to November 2016. They are expected to lamb between February and April 2017. Twenty-seven wethers and 32 old ewes were sold during this period.

Table 18: Damara sheep births from January 2016 to December 2016 (cM = castrated male).

Studbook #	Sex	DOB	Dam	Sire	Dead/Alive
329	cM	27-Jan-16	233	263	Alive
330	cM	27-Jan-16	246	263	Alive
331	cM	28-Jan-16	81	263	Alive
332	F	28-Jan-16	81	263	Stillborn
333	cM	29-Jan-16	196	263	Alive
334	cM	29-Jan-16	179	263	Alive
335	cM	29-Jan-16	179	263	Alive
336	F	30-Jan-16	65	263	Alive
337	cM	30-Jan-16	65	263	Alive
338	cM	30-Jan-16	67	263	Alive
339	cM	30-Jan-16	220	263	Alive
340	cM	30-Jan-16	212	263	Alive
341	F	3-Feb-16	241	263	Alive
342	F	5-Feb-16	186	263	Alive
343	F	5-Feb-16	76	263	Alive
344	cM	5-Feb-16	80	263	Alive
345	cM	5-Feb-16	273	263	Alive
346	F	5-Feb-16	231	263	Alive
347	cM	8-Feb-16	214	263	Alive
348	cM	8-Feb-16	238	263	Alive
349	cM	8-Feb-16	211	263	Alive
350	cM	8-Feb-16	184	263	Alive
351	F	8-Feb-16	243	263	Alive
352	cM	8-Feb-16	244	263	Died
353	cM	9-Feb-16	68	263	Alive
354	F	9-Feb-16	193	263	Alive
355	cM	9-Feb-16	206	263	Alive
356	cM	9-Feb-16	49	263	Alive
357	F	9-Feb-16	103	263	Alive
358	cM	10-Feb-16	103	263	Alive
359	cM	10-Feb-16	72	263	Alive
360	F	10-Feb-16	203	263	Alive
361	F	11-Feb-16	182	263	Alive

362	cM	11-Feb-16	54	263	Alive
363	F	12-Feb-16	275	263	Alive
364	cM	12-Feb-16	185	263	Alive
366	cM	12-Feb-16	64	263	Alive
367	F	12-Feb-16	262	263	Alive
368	cM	13-Feb-16	197	263	Alive
369	F	15-Feb-16	257	263	Alive
370	cM	16-Feb-16		263	Alive
371	F	19-Feb-16	70	263	Alive
372	F	19-Feb-16	70	263	Alive
373	F	25-Feb-16	270	263	Alive
374	F	28-Feb-16	274	263	Alive
375	F	29-Feb-16	74	263	Alive
376	cM	1-Mar-16	236	263	Alive
377	cM	29-Feb-16	287	263	Alive
378	cM	3-Mar-16	204	263	Alive
379	F	3-Mar-16	277	263	Alive
380	cM	3-Mar-16	194	263	Alive
381	cM	4-Mar-16	79	263	Alive
382	cM	10-Mar-16	302	263	Alive
383	cM	10-Mar-16	306	263	Alive
384	cM	17-Mar-16	173	263	Alive
385	F	18-Mar-16	209	263	Alive
386	F	25-Mar-16	174	263	Alive
387	cM	26-Mar-16	289	263	Alive
388	F	26-Mar-16	292	263	Alive
389	cM	30-Mar-16	77	263	Alive
390	cM	31-Mar-16	229	263	Alive
391	cM	2-Apr-16	245	263	Alive
392	F	2-Apr-16	174	263	Alive
393	cM	6-Apr-16	173	263	Alive
394	cM	7-Apr-16	190	263	Alive
395	F	7-Apr-16	287	263	Alive
396	cM	9-Apr-16	77	263	Alive
397	cM	10-Apr-16	302	263	Alive
398	cM	10-Apr-16	207	263	Alive
399	F	12-Apr-16	225	263	Alive
400	cM	13-Apr-16	192	263	Alive
401	F	13-Apr-16	209	263	Alive
402	cM	16-Apr-16	306	263	Alive
403	cM	17-Apr-16	289	263	Died
404	cM	17-Apr-16	291	263	Alive
405	cM	17-Apr-16	248	263	Alive

From January to December 2016, seven Damara sheep died due to different causes of death. SB# 174 was euthanized due to old age. SB# 357 and SB# 353 both broke a leg while out with the herd

and were euthanized as the fractures were too high up the leg and could not be fixed. Female sheep SB# 207 was found with an injured neck in the morning from unknown causes and had to be euthanized. SB# 403 was presumed dead after he was reported missing when the herd returned from the field. A search to find the young lamb was fruitless. SB# 332 was a stillborn lamb and SB# 352 died shortly after birth.

Dairy Goats

The dairy goat herd increased by 23, from 129 animals on 31 December 2015 to 152 (9M, 98F, 44 wethers) on 31 December 2016.

The dairy goat does are managed in such a way that when half of them are being bred, the other half are lactating to keep a continuous production of milk. Between March and June 2016, 41 does were bred and kidded between August and December 2016 (Table 19).

Table 19: Dairy goat breeding and kidding times from January to December 2016.

Goat	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Kimberly			Bred					Kid				
Himba			Bred					Kid				
Kate				Bred				Kid				
Daffodil				Bred			Aborted					
Lil-Red				Bred					Kid			
Caroline				Bred					Kid			
Salt				Bred				Kid				
Josephine				Bred				Kid				
Tina				Bred				Kid				
Diana				Bred				Kid				
Addie				Bred				Kid				
Rosie				Bred				Kid				
Lepelle				Bred				Kid				
Ruacana					Bred					Kid		
Prim Rose					Bred					Kid		
Peony					Bred					Kid		
Pearl					Bred					Kid		
Denali					Bred				Kid			
Pinotage						Bred					Kid	
Ruby2						Bred					Kid	
Chenin Blanc						Bred					Kid	
Yarrow						Bred					Kid	
Margret						Bred				Kid		
Indira						Bred					Kid	
Jasmin						Bred					Kid	
Caitlyn						Bred				Kid		
Poppy						Bred				Kid		
Whinnie						Bred					Kid	
Princess Saba						Bred				Kid		
Regina						Bred					Kid	
Arial						Bred					Kid	

Kunene	Bred		Kid
Dolly	Bred	Kid	
Opal	Bred		Kid
Gretel	Bred	Kid	
Garnet	Bred		Kid
Princess Adela	Bred		Kid
Princess Beatrice	Bred		Kid
Lady Jane	Bred		Kid
Trycolyn	Bred		Kid
Hannah	Bred		Kid

A total of 80 (45M, 35F) kids were born during this period (Table 20).

Table 20: Dairy goat kidding from January to December 2016 (F=female, cM=castrated male).

Studbook #	Sex	DOB	Dam	Sire	Dead/Alive
259	cM	19-Aug-16	117	110	Alive
260	cM	25-Aug-16	42	110	Alive
261	cM	27-Aug-16	59	110	Alive
262	cM	27-Aug-16	56	110	Alive
263	cM	29-Aug-16	77	110	Alive
264	cM	30-Aug-16	28	110	Alive
265	F	30-Aug-16	28	110	Alive
266	F	30-Aug-16	28	110	Alive
268	F	30-Aug-16	258	UNK	Alive
269	cM	30-Aug-16	64	110	Alive
270	F	30-Aug-16	64	110	Alive
271	cM	30-Aug-16	115	110	Alive
272	F	30-Aug-16	115	110	Alive
273	F	30-Aug-16	115	110	Alive
274	cM	3-Sep-16	130	110	Alive
275	F	3-Sep-16	130	110	Alive
276	F	4-Sep-16	131	110	Alive
277	F	4-Sep-16	131	110	Alive
278	cM	18-Sep-16	257	UNK	Alive
279	F	25-Oct-16	144	256	Alive
280	F	25-Oct-16	144	256	Alive
281	cM	26-Oct-16	168	256	Alive
282	F	26-Oct-16	168	256	Alive
283	cM	26-Oct-16	137	110	Alive
284	F	26-Oct-16	137	110	Alive
285	cM	27-Oct-16	65	256	Alive
286	F	27-Oct-16	65	256	Alive
287	cM	27-Oct-16	74	110	Alive
288	cM	27-Oct-16	74	110	Alive
289	F	29-Oct-16	132	110	Alive
290	F	29-Oct-16	132	110	Alive

291	F	31-Oct-16	186	256	Alive
292	cM	31-Oct-16	107	256	Dead
293	F	31-Oct-16	107	256	Alive
294	F	1-Nov-16	109	255	Alive
295	F	1-Nov-16	109	255	Alive
296	cM	1-Nov-16	99	255	Alive
297	cM	1-Nov-16	99	255	Alive
298	cM	1-Nov-16	91	256	Alive
299	cM	1-Nov-16	91	256	Alive
300	F	2-Nov-16	49	256	Alive
301	F	2-Nov-16	49	256	Alive
302	cM	2-Nov-16	108	255	Alive
303	F	2-Nov-16	108	255	Alive
304	cM	3-Nov-16	50	256	Alive
305	F	3-Nov-16	50	256	Alive
306	cM	3-Nov-16	100	255	Alive
307	F	3-Nov-16	100	255	Alive
308	F	3-Nov-16	45	256	Alive
309	F	3-Nov-16	45	256	Alive
310	cM	3-Nov-16	187	256	Alive
311	cM	6-Nov-16	75	255	Alive
315	F	6-Nov-16	75	255	Alive
312	F	6-Nov-16	166	256	Alive
313	cM	10-Nov-16	67	110	Alive
339	cM	10-Nov-16	67	110	Alive
340	cM	10-Nov-16	67	110	Alive
316	cM	10-Nov-16	72	110	Alive
317	F	10-Nov-16	72	110	Alive
318	cM	12-Nov-16	158	255	Alive
319	F	12-Nov-16	158	255	Alive
320	cM	12-Nov-16	103	256	Alive
321	cM	12-Nov-16	103	256	Alive
322	cM	14-Nov-16	138	110	Alive
323	cM	14-Nov-16	138	110	Alive
324	cM	16-Nov-16	174	255	Alive
325	cM	16-Nov-16	174	255	Alive
326	F	15-Nov-16	181	255	Alive
327	F	15-Nov-16	181	255	Alive
328	cM	15-Nov-16	143	255	Alive
329	cM	15-Nov-16	143	255	Alive
330	cM	15-Nov-16	152	255	Alive
331	F	15-Nov-16	152	255	Alive
332	cM	19-Nov-16	44	255	Alive
333	cM	20-Nov-16	156	256	Alive
334	cM	23-Nov-16	121	256	Alive
335	cM	23-Nov-16	121	256	Alive

336	F	23-Nov-16	121	256	Alive
337	cM	24-Nov-16	47	255	Alive
338	cM	24-Nov-16	47	255	Alive

Six dairy goats (SB# 35, SB# 217, SB# 218, SB # 220, SB# 292 and SB# 248) died during this period. SB# 35 died of bloat while being treated for internal parasites. SB# 217, 218, 220, 248 were suspected to have died from ingesting poisonous plants. SB# 292 died of a high load of coccidia.

A total of 55 dairy goats were sold.

Milk Production

There are several major factors that play a role in the amount of milk given by a specific goat. These factors include: the breed, age of the animal, lactation stage, amount and type of feed, temperature, milking frequency, availability and duration of free ranging, animal health condition, and the type of management practice. Each goat is milked twice a day, although the number of goats milked each month depends on their lactation stage.

The amount of milk each individual goat produces is monitored on a daily, weekly, and monthly basis. This allows us to determine when they are producing the most milk and then compare the amounts produced to the feed they are given.

On average, 32 goats were milked per day during this period. Table 21 shows amounts of milk production per goat per month and

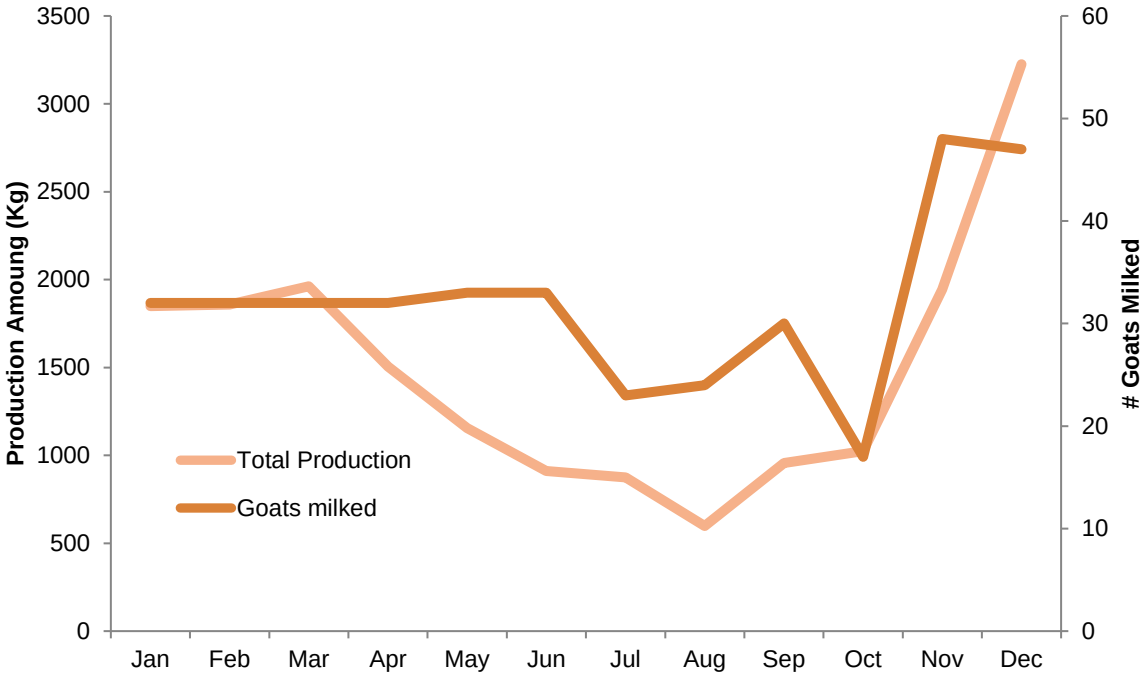

Figure 34 displays the number of goats milked each month and the milk production per month. Total milk production for this period was 17,863.4 kg, and the net production after filtering and processing waste were removed (928.8kg or 5.2%) was 16,934.6 kg; an increase of 10.8% compared to 15,280.4 kg in 2015. A total of 12,484.1 kg were supplied to the Creamery and 4,450.5 kg were allocated for raising goat kids.

Table 21 Milk production per goat per month for 2016 (kilograms).

Goat	SB#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Safire	48	85.7	81.9	89.1	72.1	59.2	52.6	57.0	51.8	45.0	49.3	44.8	59.9
Addie	176									41.2	49.8	42.6	48.2
Arial white	103	28.4	34.7	40.4	34.8	20.6	19.6	12.3	6.4			29.9	63.9
Caitlin	132	30.2	39.5	41.9	31.4	19.8	8.1					56.5	48.2
Caroline	131	31.2	37.6	44.2	33.2	19.1	5.4			53.4	68.3	60.5	67.5
Cava	166										45.1	26.2	53.9
Chardonnay	53	59.9	73.1	78.2	63.1	52.3	36.8	44.8	42.7	45.1		2.4	
Chenin Blanc	100	42.4	45.6	47.3	39.3	29.8	31.1	36.2	7.8		82.0	46.2	77.1
Daffodil	46								2.5	61.9	46.0	70.8	71.6
Daneli	257									10.3	54.7	42.5	51.5
Diana	59									45.0		49.9	57.5
Dolly Parton	65	68.7	67.4	65.8	51.8	50.1	44.9	47.3	37.3	6.4		73.6	95.1
Edelweiss	74	30.8	44.5	52.2	44.0	38.1	29.1	25.2	2.6			46.2	77.5
Garnet	91	60.6	63.9	69.7	54.4	45.3	38.8	41.7	30.7	5.3		47.2	87.5
Gretel	67	45.1	52.1	57.7	47.6	40.9	37.5	47.1	26.7	0.4		47.4	99.2
Hannah	121	50.4	49.3	50.4	28.5	20.4	24.7	27.1	20.2	0.1			89.5
Indira	49	75.5	72.6	72.6	57.4	53.7	43.9	47.5	38.3	4.6		45.2	77.7
Jasmin	44	82.1	75.5	84.0	61.7	43.5	36.2	46.3	32.0	4.5		2.6	86.3
Josephine	42	44.2	39.8	41.3	24.0	21.2	2.9			43.2	48.3	43.3	66.5
Kate	77	79.9	31.3	40.5	31.7	22.1	16.2			68.6	76.2	56.3	70.9
Katrina	142					5.7	19.8	20.8	23.6	4.6			
Kimberley	56	41.0	43.6	45.0	38.3	30.9	2.0			65.6	70.8	64.1	72.5
Kunene	143											26.6	74.5
Lady Jane	174											15.3	63.5
Lepelle	258									42.7	57.3	39.2	41.1
Lil Red	130	35.6	43.2	40.6	27.9	17.1	11.4			56.1	65.4	60.3	65.0
Margaret	72	52.7	64.2	71.4	55.0	30.3	34.6	46.1	37.3	5.6		49.5	111.0
Noir	50	110.7	99.3	95.0	74.3	52.2	42.3	48.9				61.4	92.0
Opal	47	88.6	78.9	84.2	70.7	55.5	44.4	48.7	39.4	9.0	2.7	5.7	99.1
Pearl	186								42.8	32.5		32.4	45.8
Peony	168											40.7	68.8
Pinotage	75	74.5	76.1	71.0	59.1	49.7	39.4	36.0	12.9			40.7	76.5
Poppy	137	40.4	48.5	49.8	32.2	31.9	32.3	32.7	15.1			47.7	63.0
Prime Rose	138	40.7	39.4	45.4	30.9	31.5	16.1					30.2	75.3
Princess Adela	152											14.5	47.2
Princess Saba	107	62.6	58.9	62.1	52.4	41.7	36.3	36.2	14.7			47.3	69.5
Regina	99	29.2	35.9	42.8	37.9	25.6	24.6					51.3	61.3
Riesling	156											3.8	50.9
Rosie	64	46.2	49.7	56.2	43.5	21.5	3.3			91.5	86.3	68.5	80.5
Ruacana	144											43.0	58.2
Ruby2	108	37.1	42.0	47.3	43.0	26.9	23.9	23.7	8.9			41.9	65.5
Rapunzel	187								.			27.0	60.2
Salt	115	54.7	53.8	56.4	40.1	32.3	14.9			67.8	58.3	47.5	53.2
Tina	28											51.1	35.2

Tina2	124	68.2	73.3	74.8	43.8	42.6	41.2	44.6	37.0	63.7	70.7	52.5	66.2
Trycolin	181									39.9	45.6	14.2	54.1
Whinnie	109	80.4	79.0	77.5	56.7	40.4	26.9	23.2	3.2			42.5	90.8
Yarrow	45	84.6	78.3	80.1	58.3	43.2	39.4	49.1	33.4	3.3		34.2	79.4
Zinfandel	52	86.7	85.1	87.1	66.0	40.2	30.2	32.1	30.7	39.6	47.9	56.5	55.5
Total	-	**1849.0**	**1858.0**	**1962.0**	**1505.1**	**1155.3**	**910.8**	**874.6**	**598.0**	**956.9**	**1024.7**	**1943.7**	**3225.3**
Goats milked per day (avg.)		**32**	**32**	**32**	**32**	**33**	**33**	**23**	**24**	**30**	**17**	**48**	**47**

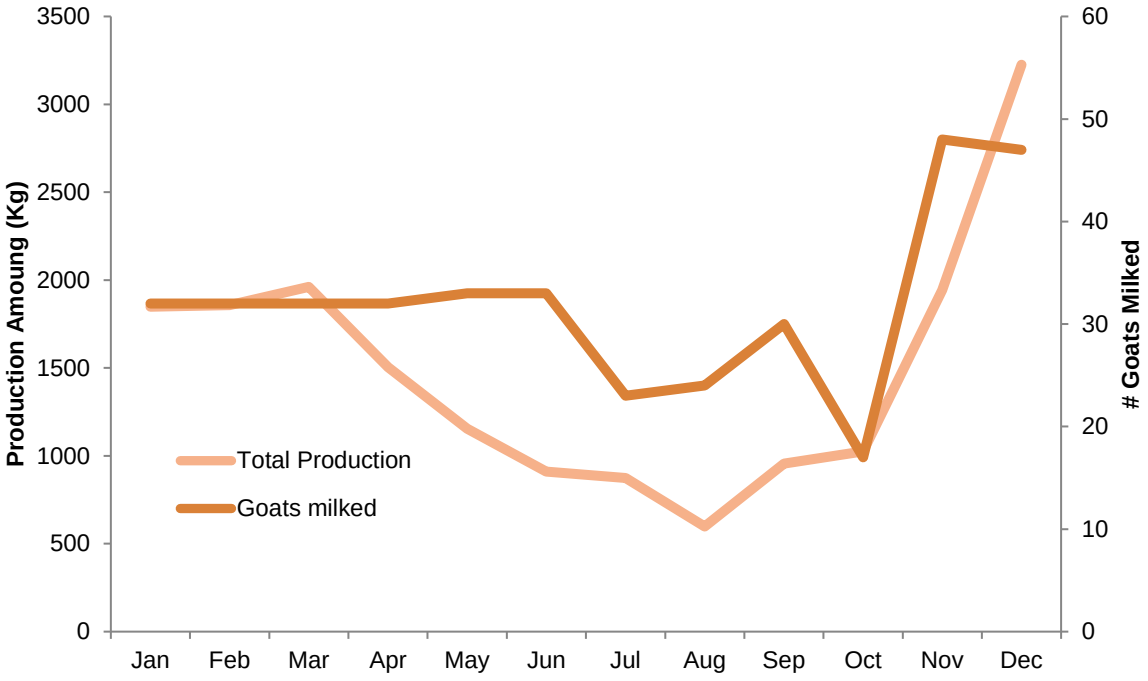

Figure 34: Average number of goats milked per day and monthly milk production for 2016 (kilograms).

Feed provided to CCF Small Stock

To ensure the health of all our goats and sheep we constantly monitor their food requirements and intake. We currently use five feed products to provide the correct variety of nutrients for our animals. They include: Alfalfa hay, Ram, lamb, and ewe pellets; milk goat pellets, and grass hay. Figure 35 shows the amount used of each for this reporting period. Due to the drought experienced in 2015, there was a shortage of peanut hay on the market. The use of this product was replaced by Lucerne for the year 2016.

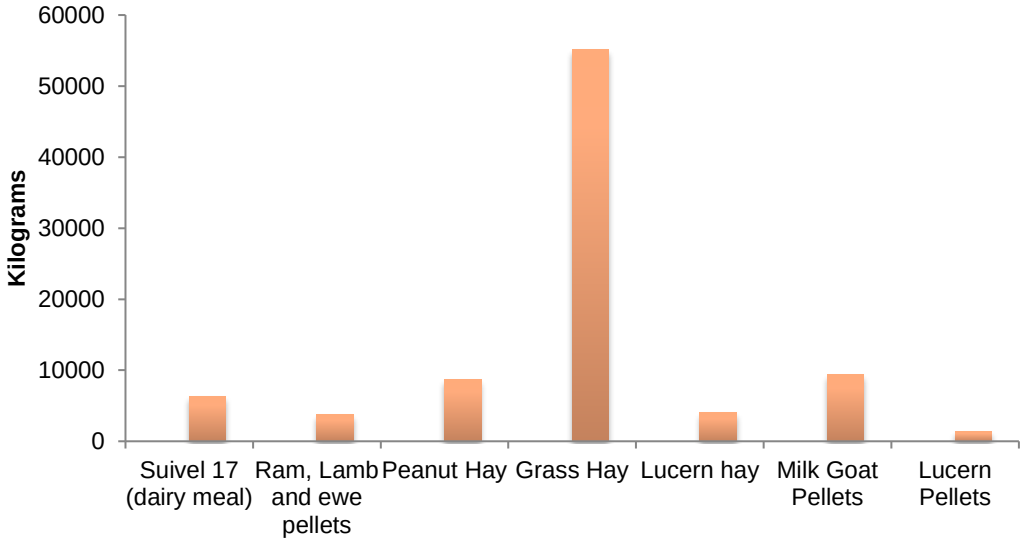

Figure 35: Amount and type of small stock feeds used from January to December 2016.

All lactating dairy goats receive Lucerne hay and milk goat pellets. The lactating dairy goats also go out each day to graze behind the *kraal*. The dairy and Boer bucks, as well as the Damara ram, receive the ram, lamb, and ewe pellets. Even though the Boer goats and Damara sheep receive most of their nutrients from going out each day into the bush, when pregnant does or ewes give birth they receive other feed products while they stay in and care for their young. All animals that do not go out to graze and the lactating dairy goats receive grass hay twice a day.

Vaccinations and De-worming

All CCF's small stock is treated for internal and external parasites on a quarterly basis in January, April, July, and October of each year. The product used for internal parasite treatment rotates between the following four products: Fenbendazole, Ivermectin, Albendazole, and Doramectin. The product used at each treatment is determined by which product was used previously; anthelmvehiclintic products are rotated between drug classes to help prevent development of resistance among the parasites, which can happen when the same product is used repeatedly. Both before and after each quarterly parasite treatment, a herd-wide Faecal Egg Count (FEC) is performed to determine the internal parasite burden in the animals. This is done by collecting representative faecal samples from various areas in the *kraal*. The pre- and post-treatment testing helps ensure that the treatments reduce the parasite burden in the animals, which helps to ensure efficacy of the products used. For external parasite (tick, fly, and lice) prevention Paracide (Pfizer Animal Health) and Ultra-Boss Pour-On (Schering-Plough Animal Health) are rotated at each quarterly treatment. Vaccines are applied as follows. In addition, this year CCF vaccinated all small stock against Anthrax.

- Glanvac 3 – for the control of caseouslymphadenitits (*Co rynebacteriumpseudotuberculosis*) and prevention of enterotoxemia, pulpy kidney disease (*Clostridium perfringens* Type D), and tetanus (*Clostridium tetani*).

    - Adult female animals are vaccinated one month before giving birth (parturition)
    - Adult male animals are vaccinated once annually.
    - Newborns are vaccinated at three and four months of age and then annually thereafter.

- Pasteurella – for the control of Pasteurella haemolytica respiratory infection ('shipping fever').

    - All adult animals are vaccinated annually.
    - Newborns are vaccinated at three and four months of age and then annually thereafter.

- Brucellosis – for the control of *Brucellaovis*and *Brucellamelitensis*, a bacterial infection of the reproductive tract.

    - This vaccine is given only once and provides life-long immunity; all young animals are vaccinated at four months of age.

- Enzootic Abortion – for the control of Chlamydophilapsittici, an organism that causes early and late term abortions.

    - All female animals are vaccinated one month before breeding on an annual basis.

- Rabies – for the prevention of rabies virus which causes fatal encephalitis.

    - All adult animals are vaccinated yearly.
    - All newborns are vaccinated at nine months of age and then annually thereafter.

3. Hay Production

During this period CCF produced 1,000 bales of hay.

4. Wild Game Hunted on CCF Property

As part of CCF Model Farm's sustainable wildlife management practices, CCF hunts several wild game species for consumptive purposes, including oryx, kudu, red hartebeest, and warthog. Figure 36 below displays the amount of wild game removed for consumptive use for this reporting period.

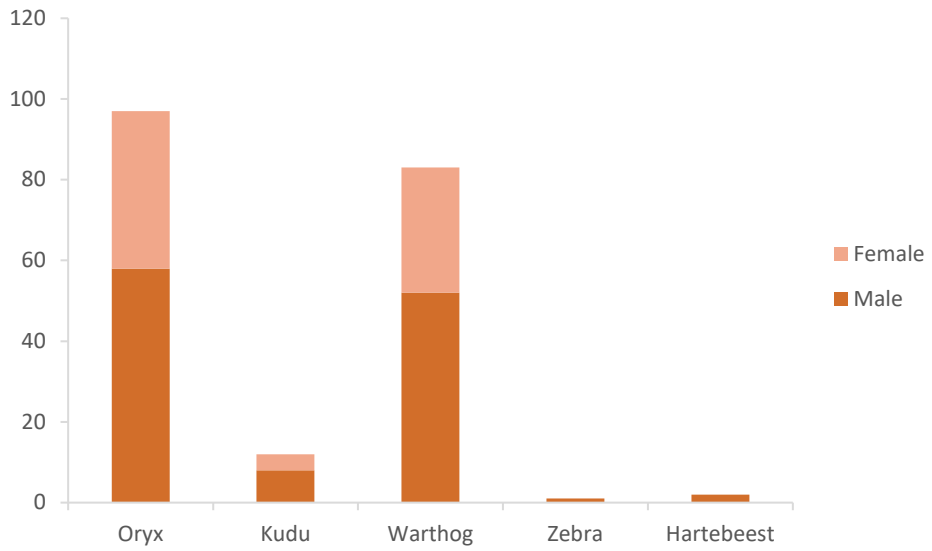

Figure 36: Amount of game (male and female) utilised by CCF from January - December 2016.

C. Sustainable Economic Programmes Supporting Local Communities

If the world's fastest cat is to survive in the wild, humans must coexist with it. The following progress has been made on CCF's activities that seek to assure the economic wellbeing of people living within the cheetah's range and provide resources to support CCF's long-term activity.

1. Certified Wildlife Friendly

CCF is a co-founder of The Wildlife Friendly Enterprise Network (WFEN), which is a 'global community dedicated to the development and marketing of products that conserve threatened wildlife while contributing to the economic vitality of rural communities'. The WFEN provides the 'Certified Wildlife Friendly' trademark (Figure 37) that distinguishes enterprises that meet the highest standards of being wildlife friendly. CCF's Bushblok and Dancing Goat Creamery are both Certified Wildlife Friendly.

Figure 37: Certified Wildlife Friendly log.

2. Bushblok

Operations

Production for 2016 amounted to 241 tonnes, while the sales were 272 tonnes. Table 22 shows the monthly block production during this reporting period.

Table 22: Monthly block production January to Dec 2016.

Month	Amount (tonnes)
January	0
February	15
March	14
April	15
May	34
June	34
July	32
August	25
September	27
October	14
November	23
December	8
Total	**241**

General Information

The Forest Stewardship Council (FSC)™ annual inspection was held and passed in April 2016.

Major progress was made for the relocation of the bush factory to the CCF main centre at Elandsvreugde. The relocated facility will be known as the Biomass Technology Demonstration Centre (BTDC). It will include the BUSHBLOK factory, a carbonizing kiln, and eventually a biomass-fuelled power plant.

- Two sheds, a canteen, generator building, and diesel storage area were constructed
- The carbonising kiln arrived and was installed in one of the new sheds.
- A new genset was installed and a major cable laid to feed power from the BTDC to the main campus (and to back feed battery power from campus to BTDC).
- Communication cables and wireless access were installed to allow monitoring.

Maintenance on the extruders and cut off saws continue to be a challenge. More research was done by DSV Consulting Engineers to help establish the cause of the high wear and tear on the extruders and a sample of woodchip was sent to Italian sand-removal specialists. We contacted Windhoek machinists to fabricate replacement parts.

Dr Brewer remained active in groups involved with bush encroachment in Namibia. These included the National Rangeland and Bush Encroachment Forum, which is convened by the Ministry of Agriculture, Water and Forestry, and the GIZ/MAWF De-bushing project, which is supported by the German Development Authority. There was much activity of the GIZ group as a joint marketing company is under consideration. CCF also participates in a Finnish government/UNAM study of the value of thornbush as feedstock for livestock or captive wildlife.

In February, Dr Brewer presented the Namibian biomass situation at the European Pellet Conference in Austria, and in May he attended the World Bioenergy conference in Sweden and the Energy DeCentral tradeshow in Germany in November (see Section IV.F.2).

In July, CCF USA Director Dan Beringer visited for a month and assisted with document writing and planning of all CCF Biomass initiatives.

CCF Senior Ecologist & Forest Steward, Matti Nghikembua, continues to work towards a PhD in Forestry and Bio Resources at the University of East Finland (JOENSUU), Finland

3. Cheetah Country Initiatives

Dancing Goat Creamery

Background

The CCF Dancing Goat Creamery programme aims to facilitate training and skill development around the production of dairy goat products, thus enabling livelihood diversification and supplemental income to both CCF and community members.

CCF began producing fresh goat cheese in August 2009 using the milk from six CCF dairy goats, which came from the award-winning dairy farm Fairview in South Africa. In early April 2013, CCF opened

the Dancing Goat Creamery, where high-quality artisanal fresh goat cheeses, as well as a variety of goat milk ice creams, fudge, and soaps are produced daily by CCF's Creamery Manager Hanlie Visser and head cheese maker Sherien Garoes. Sherien, having worked at CCF for over 10 years, has been making CCF's cheeses for six years. Hanlie has a degree in Hospitality and Catering from Boland College in Stellenbosch. With the opening of the new creamery, CCF also launched a new label for their cheeses.

The Dancing Goat Creamery is an essential part of CCF's Model Farm, which alongside its celebrated Livestock Guarding Dog Programme, allows CCF to demonstrate how cheetahs and livestock can live together and how local farmers can be successful using non-lethal predator management strategies to protect their livestock and thus their livelihoods.

As with the CCF International Research and Education Centre, the CCF Model Farm and Dancing Goat Creamery are open to the public daily and local farmers are encouraged to visit.

Production

CCF's Dancing Goat Creamery was supplied with 12,484.14kg of milk from CCF's Model Farm between January and December 2016. Table 23 shows amounts of milk allocated to each of the Creamery products.

Table 23: Milk allocation per product from January to December 2016.

Product	Milk Used (kg)
Feta	6,551.22
Chèvre	3,380.32
Ricotta	1,340.11
Mozzarella	366.1
Fudge	695.93
Ice cream	114.46
Soap	36
Total	**12,484.14**

Of this milk, 79.16% was used to produce 1,271.24 kg of the Creamery's original cheeses, feta and chèvre (Table 24). In addition, the Creamery produced 208.75 kg of ricotta and 44.44 kg mozzarella cheeses, 90.06 kg of fudge, 145.27kg of ice cream, and 54.00kg of soap. Total production for this period was up 17.2% from 1,813.76 kg, up from 1,548.08 kg in 2015.

Table 24: Feta and chèvre monthly production (Kg) in 2016.

Month	Feta	Chèvre	Total
January	49.18	37.30	86.47
February	61.86	41.70	103.56
March	80.34	39.20	119.54
April	64.294	41.45	105.74
May	65.21	31.25	96.46
June	39.76	24.15	63.91
July	81.73	25.91	107.64
August	81.43	13.97	95.41
September	70.6	23.69	94.30
October	57.52	28.52	86.03

November	80.49	27.89	108.38
December	118.45	85.34	203.80
Total	**850.86**	**420.38**	**1271.24**

Expenses

Creamery expenses such as cheese cultures, packaging, labelling, herbs, labour, gas, and electricity are estimated at N$9 168.89 for this period, averaging N$5.06 per kilogram of product. Total milk costs amounted to N$68,168.86 at an average of N$37.58 per kilogram of product. The average amount of milk to produce a kilogram of cheese is 7.63, whereas fudge requires 7.73kg, ice cream 0.79kg, and soap 0.67kg. Table 25 shows the breakdown of costs for the various Creamery products and the total cost per kilogram of product.

Table 25: Production costs (N$) of creamery products. January to December 2015 (excluding soap).

Product	Production (kg)	Milk/kg	Total Milk Used (kg)	Total Milk Cost	Total Other Cost	Total Production Cost	Total cost per kg
Feta	850.86	7.60	6,466.52	35,307.20	4,301.25	**39,608.45**	**46.55**
Chèvre	420.38	8.13	3,417.12	18,657.48	2,125.07	**20,782.55**	**49.44**
Ricotta	208.75	6.65	1,389.01	7,583.99	1,055.25	**8,639.24**	**41.39**
Mozzarella	44.44	8.24	366.10	1,998.91	224.70	**2,223.60**	**50.03**
Fudge	90.06	7.73	695.93	3,799.78	455.25	**4,255.03**	**47.25**
Ice cream	145.27	0.79	114.46	624.95	734.39	**1,359.34**	**9.36**
Soap	54.00	0.67	36.00	196.56	272.98	**469.54**	**8.70**
Total	**1,813.76**		**12,485.14**	**68,168.86**	**9,168.89**	**77,337.75**	

Sales

Creamery product sales for this period totalled 1,666.36 kg, while an additional 82.25 kg were distributed as promotional samples and gifts at events such as agricultural shows, farmers' markets and tourism fairs. Total revenues for this period grew 8.2% from N$181,803.87 in 2015 to N$196,656.02 in 2016, while profits saw a robust increase of 14.4%, from N$106,353.20 in 2015 to N$121,652.45 in 2016 (Table 26).

Table 26: Breakdown of creamery production and sales (N$) from January to December 2016.

Product	Kg	Cost/Kg	Total Cost	Revenue	Profit
Feta	174.60	46.55	8,127.81	16,382.40	8,254.59
Chèvre	100.63	49.44	4,974.95	15,269.60	10,294.65
Ricotta	6.75	41.39	279.36	840.00	560.64
Ice cream	8.00	9.36	74.86	400.00	325.14
Soap	2.85	8.70	24.78	650.00	625.22
Fudge	29.30	47.25	1,384.39	4,540.10	3,155.71
Stores and Lodges	**322.13**		**14,866.15**	**38,082.10**	**23,215.95**
Fudge (Gift Shop)	33.65	47.25	1,589.92	2,684.00	1,094.08
Soap (Gift Shop)	16.25	8.70	141.30	3,605.00	3,463.70
Cheese (Gift Shop)	29.05	46.85	1,361.00	3,785.00	2,424.00

Ice cream (Gift Shop)	54.80	9.36	512.77	10,059.00	9,546.23
CCF Gift Shop	133.75		3,604.99	20,133.00	16,528.01
Ice Cream (Babson)	46.18	9.36	432.11	10,159.60	9,727.49
Soap (Babson)	29.10	8.70	253.03	3,492.00	3,238.97
Cheese (Babson)	97.50	46.85	4,567.91	11,700.00	7,132.09
Fudge (Babson)	18.70	47.25	883.55	2,805.00	1,921.45
Total (Babson)	191.48		6,136.60	28,156.60	22,020.00
Ice Cream (Café)	30.00	9.36	280.71	6,600.00	6,319.29
Cheese (Café)	784.00	46.85	36,730.66	94,080.00	57,349.34
Total (Café)	814.00		37,011.37	100,680.00	63,668.63
Cheese (Hotspot)	205.00	46.85	9,604.32	9,604.32	-
Ice Cream (Hotspot)	-	9.36	-	-	-
Total (Hotspot)	205.00		9,604.32	9,604.32	-
Total (CCF)	**1,344.23**	**-**	**56,357.28**	**158,573.92**	**102,216.64**
Cheese samples	76.00	46.85	3,560.63	-	(3,560.63)
Fudge samples	4.25	47.25	200.81	-	(200.81)
Ice cream samples	2.00	9.36	18.71	-	- (18.71)
Promotional samples	**82.25**		**3,780.15**	**-**	**(3,780.15)**
Total All Products Sold	**1,748.61**	**-**	**75,003.58**	**196,656.02**	**129,212.74**
Inventory (Cheese)	50.90				
Inventory (Fudge)	4.16				
Inventory (Ice cream)	4.29				
Inventory (Soap)	5.80				

Cheese deliveries were made to approximately 25 different customers, nine of which order on a regular basis. CCF's main customers include Maerua Super Spar, Desert Hill, Fruit and Veg, Theo Spar, and the Frans Indongo Lodge.

The Dancing Goat Creamery also creates a secondary industry for CCF with increased revenues for its eco-tourism business by offering its products for sale to visitors at the Cheetah Gift Shop at retail price. As shown on the above table, during this period the Creamery supplied the Gift Shop with 133.75 kg of product (cheese, fudge, soap, and ice cream).

The Creamery also supplies product to the CCF kitchens at Babson House, Cheetah Café, and the Hot Spot. During this period, the CCF kitchens were supplied with 1,344.23 kg of ice cream, fudge, cheese, and soap.

At the end of this period, the remaining inventory in CCF's freezers was 50.90 kg of cheese, 4.16 kg of fudge, 5.80kg of soap and 4.29kg of ice cream.

Client Development

Increasing production to satisfy the growing demand of the Dancing Goat products, while maintaining quality and customer satisfaction, continue to be our focus.

The Chewbaaka Memorial Garden

CCF's Chewbaaka Memorial Garden continues to produce fresh vegetables for consumption by more than 40 CCF staff and volunteers, as well as visitors to the Cheetah Café and Babson House guests. Namibia imports approximately 80% of its fruits and vegetables, mostly from South Africa, transporting it across long distances and increasing use of fossil fuels and carbon emissions that contribute to climate change. By localising food production, CCF is not only reducing the environmental and social impacts of transporting food, but is also providing fresher, tastier, and more nutritious meals while saving money.

To counteract the heavy clay-sand soil, CCF uses aged manure from its farm animals and a by-product from its Bushblok production: wood dust. These materials are mixed into parent soil to improve fertility and organic matter content. CCF is also creating compost from food scraps, which is an essential ingredient for any organic garden. CCF staff, volunteers, and CCF gardener, Petrus Johannes, have been trained in proper composting techniques. CCF is consistently harvesting a variety of salads and vegetables including beans, beetroot, carrots, daikon radishes, peas, squash, lettuces, turnips, parsnips, rutabagas, cilantro, chard, endive, mustard, rocket, spinach, radishes, and okra.

Since its inception, the garden's harvest has continued to grow. By having diverse plantings in a small space, the garden remains chemical-free because it invites beneficial insects to do the work of managing unwanted insects. Sunflowers and other flowers attract pollinators. The vegetables are therefore healthier for the environment, the growers, and the consumers. Seeds were provided courtesy of Baker Creek Heirloom Seeds, an American company based in Missouri that distributes from California. We have 42 varieties of heirloom vegetable seeds.

Because of a designated gift from CCF USA Trustee Candice Clough in honour of her father, a new greenhouse and pond were installed in May, including electric and water servicing.

The garden is one more step in CCF's sustainability programme, which includes an extensive recycling programme and composting. CCF includes the Chewbaaka Memorial Garden and Sustainable Practices in farmer training programmes as yet another way to promote alternative livelihoods and economic growth in Namibia.

The Apiary

The colony that took over one of CCF's existing colonies continues to do very well at CCF's apiary. A third super (hive extension) has been added and for this super a queen excluder has been added to allocate this super solely to honey.

Another colony has moved into the old tire hive, from which the past colony absconded. This took place without any assistance or interference from CCF beekeepers and the colony seems to be doing extremely well. Plans are in place to modify the hive to allow supers to be added.

Having bees at CCF is beneficial for many different reasons. Honey harvesting and sales will add to CCF's diverse income and food sustainability. In addition, bees pollinate the crops at CCF's organic garden and increase food production. CCF intends to build up the apiary to teach more aspects of sustainability to visitors and local farmers, and to produce honey for food and added income. Along with CCF's Model Farm, the apiary will help to demonstrate predator-friendly farming techniques, as honeybees are part of an integrated farming system that diversifies income and adds value to the landscape.

The Vineyard

In January 2016, 220 kg of grapes were harvested with a 23% sugar content. This is a 10% increase from the previous year (Figure 38).

Many of the new Shiraz and Columbard sticks planted during this period were unfortunately lost during the winter months (May-August). However, the older plants (40 Shiraz and 70 Columbard), which were pruned in late September, are doing well. To protect them from birds, netting was added to the entire vineyard. With this, the harvest in 2017 is forecast to be over 330 kg.

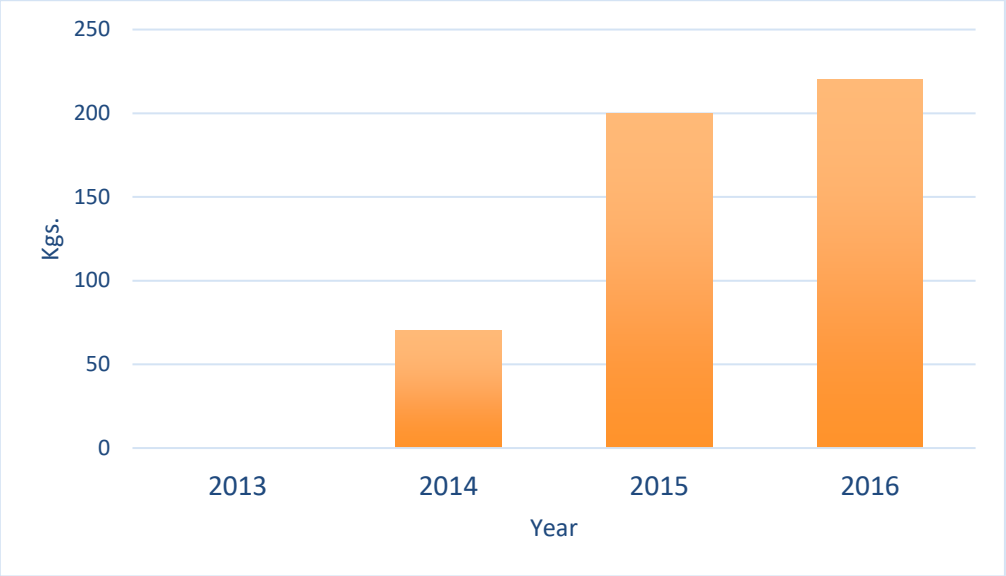

Figure 38. Grapes harvested 2013-2016 (kilograms).

D. Eco-Tourism

Tourism is one of Namibia's fastest growing industries, with a large number of developments emerging in the Otjiwarongo area over the past couple of years. CCF's eco-tourism potential continues to grow, as it has become one of the region's leading travel and tourism destinations, thus boosting the local businesses of Otjiwarongo.

1. Visitors to CCF

At end of 2016, CCF had received 10,237 tourists and 1,633 students/learners/teachers for a total of 11,870 visitors, which represents a 36% increase from 8,753 in 2015. In terms of income, this period saw a 34.9% increase at N$4,662,160 compared with N$3.455.987.70 in 2015.In addition to school groups and film crews mentioned separately, CCF hosted many friends, supporters, and collaborators from January to December 2016; many of them on return visits.

We were honoured to host the Honourable Professor Peter Katjavivi and his wife Jane Katjavivi, CCF Namibia Board member, as well as a US State Department delegation led by Amb. Thomas E Daughton and Assistant Secretary of State for African Affairs, Amb. Linda Thomas-Greenfield. During their visit, the US delegation was given a tour of CCF, including the Bushblok facility under construction, and presentations on the work of CCF and illegal wildlife trafficking. In addition, CCF

Ambassador and Olympic gold medallist Anna Veith and her husband Manuel Veith visited us accompanied by photographer Thomas Kettner who photographed CCF's Cheetahs.

Long-time friends and supporters who visited CCF during this period included Nancy Boynton from the US, who returned to volunteer at CCF for the 12th time, and Elfie Stark, artist and long-term supporter returning as a working guest for two weeks, during which time she completed a cheetah mural on the exterior of the Visitor Centre. We also had the honour to host Betty von Hoenning O'Carroll from CCF Italia, Dr Jane Galton, Co-Chair of CCF UK, CCF USA Trustees Angela Weisskopf and Melanie Brookes-Weiss. Donna Rainboth, on sabbatical from Eastern Oregon University, spent six months with us helping with the development of CCF's teacher training programme and revising our teacher resource guide, Cheetahs: A predator's role in the ecosystem. CCF Northern California (NOCA) Chapter member Addison Nuding and his family came to CCF and donated Google Chromebooks and added CCF to Google Streetview. Josanne Virene and Randy Sparks, also part of the CCF NOCA Chapter, attended the CCF Gala and subsequently visited the centre in Otjiwarongo. Other notable visitors and CCF supporters from the US in 2016 were Bill Patterson, Adina Savin, Deb and Skip Elliott, Sara Nichols and John Wilson. Steve O'Brien the CCF Chair Emeritus, CCF's illegal wildlife trade specialist Patricia Tricorache, and Simone Eckhardt of CCF Holland/Stitching Spots also visited CCF in 2016.

CCF is utilised as a field-study area by scientists around the world. During this period, we welcomed back David Millican, of Virginia Polytechnic Institute and State University, who spent three months at CCF conducting research for his PhD thesis on cavity nesters. Marleen De Blecourt, from the University of Hamburg, returned to CCF to continue her soil study. Dr Scott Turner from State University of New York (SUNY) returned to CCF to continue with his termite research. James McIver from Oregon University spent two months at CCF to work on a biodiversity research permit for CCF.

2. Visitor Analysis

As tourists are increasingly becoming seasoned international travellers, they become more discerning and choose those destinations that can provide a more memorable experience and good value for their money. Therefore, CCF strives to ensure that the product offered to the tourism sector is sufficiently attractive.

This reporting period saw a strong growth with 40.5% increase in tourist numbers (10,237) compared to 7,288 in 2015 (Figure 39).

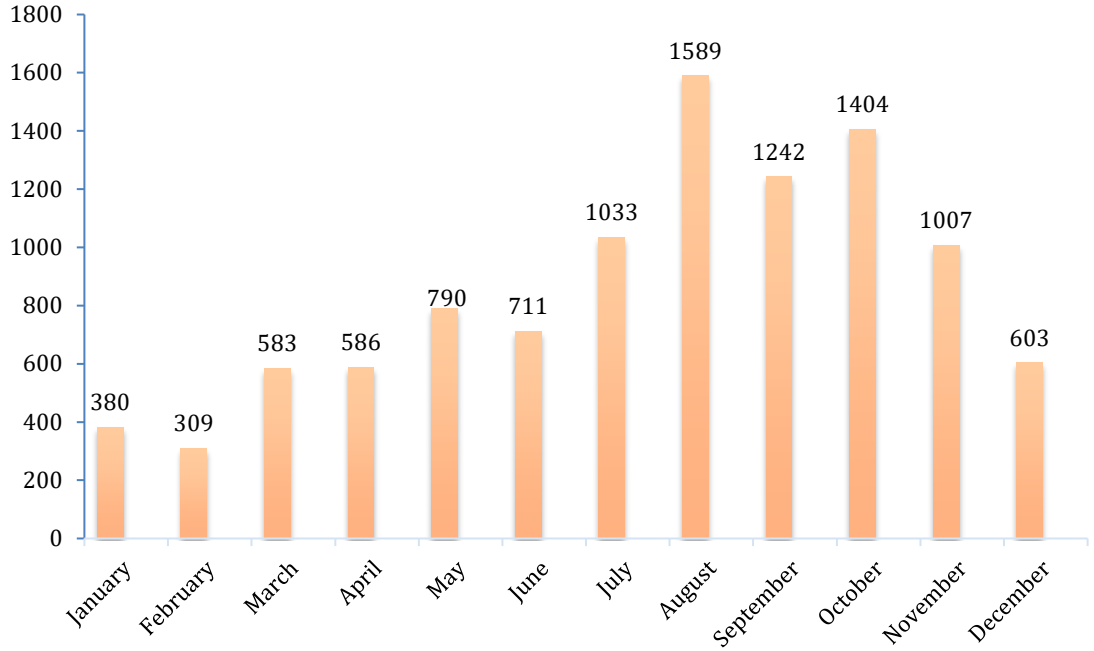

Figure 39: Number of visitors to CCF per month from January to December 2016.

The predominant language spoken by visitors during this period was English (36%), followed by German (29%), and French (28%) (Figure 40). In terms of nationalities, most visitors were from France, followed by Germany and Namibia (Figure 41).

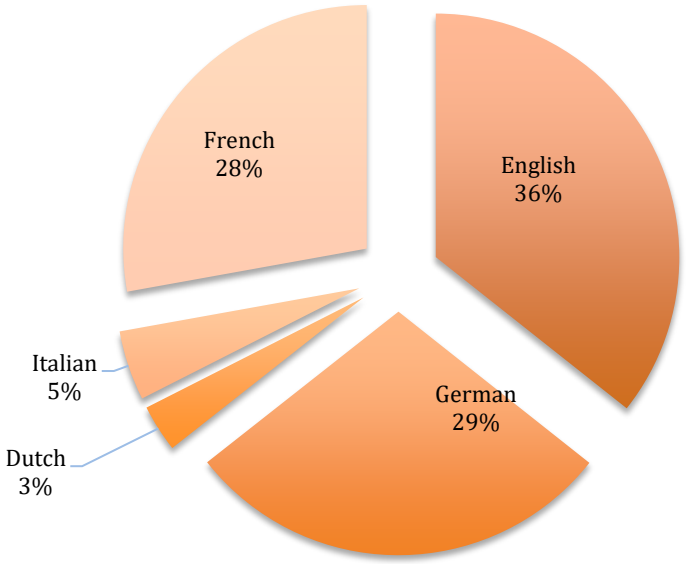

Figure 40: Languages spoken by visitors January to December 2016.

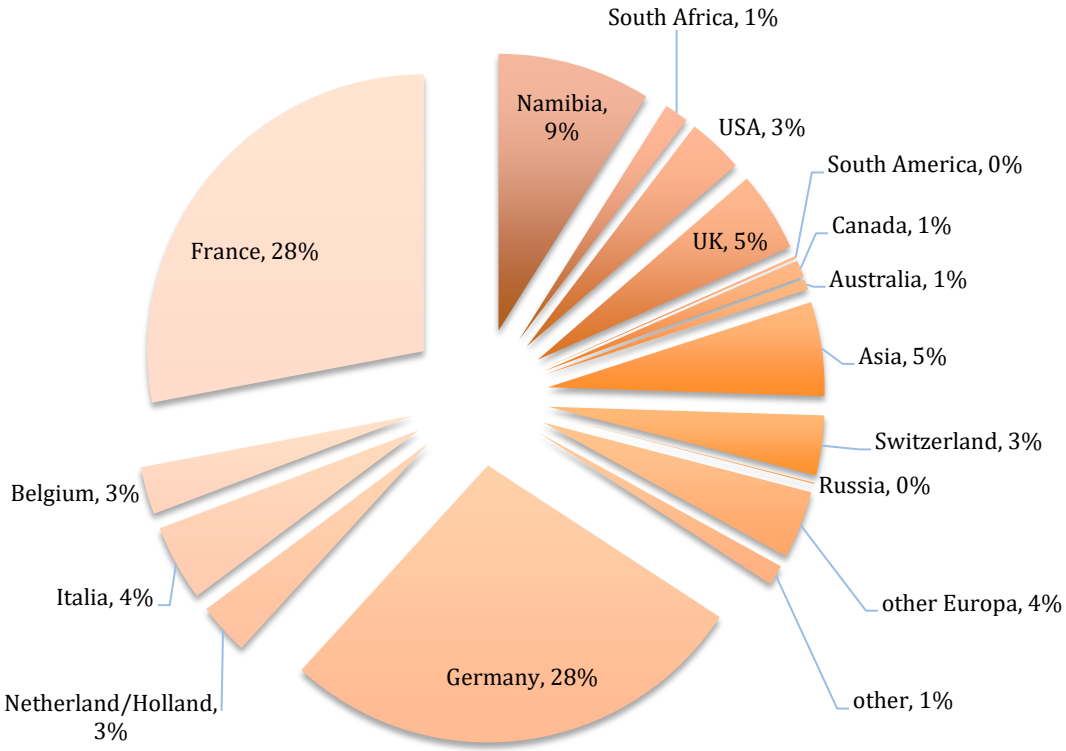

Figure 41: Percentage of visitors per country from January to December 2016.

Most visitors continue to be walk-ins, representing 46% of all sources (

Figure 42) with 5,494 from January to December 2016 compared to 4,081 in 2015. The number of visitors booked by CCF's reservation agent, Exclusive Reservations, increased from 2,032 during last period to 3,359 in this period, representing a 65.3% increase against other sources.

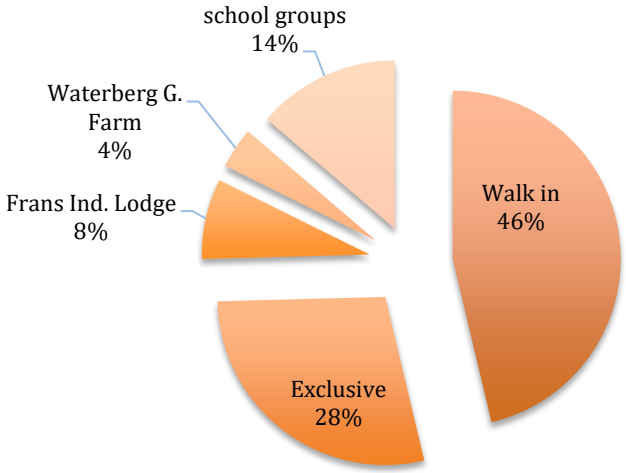

Figure 42: Sources of visitors to CCF from January to December 2016.

In terms of income, CCF saw a robust increase of 38.29% during this period, at N$4,662,160 compared with N$3,455,877.00 in 2015 (Figure 43).

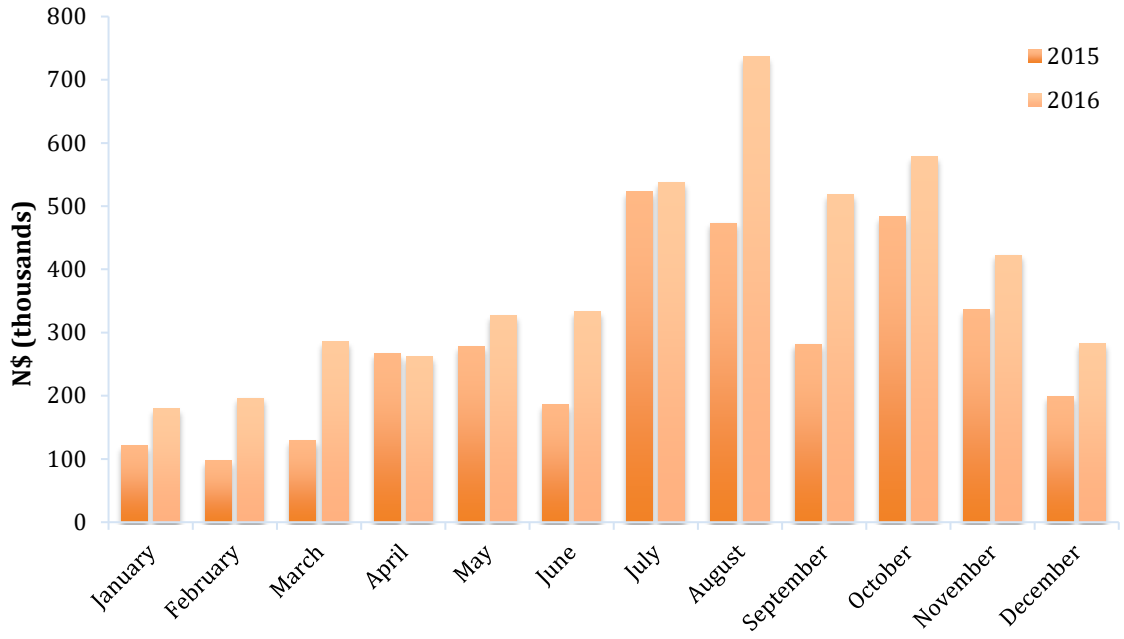

Figure 43: Tourism income (N$) from 2015 versus 2016.

Table 27 provides the monthly breakdown of income per activity and number of visitors, showing that the month with the highest average of expenditure per visitor was February at N$635.81 and the lowest month was October with N$412.28 per visitor. The average amount spent by visitors at CCF shows a 4% decrease in 2016 with N$455 compared to N$474 in the same period of 2015. Cheetah Drives (Elands) represented the highest income sources during this period, at 35.08 % of the total income with N$1,635,558.00. Gift Shop revenue shows a 24.9% increase with N$1,027,069.00 in 2016 compared to N$822,288.00 in 2015 and replaces Centre Tours as the second highest revenue driver.

Table 27: Monthly income per eco-tourism activity from January to December 2016 (Namibian dollars).

ACTIVITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL	%
ELANDS	53,232	60,866	93,830	71,406	97,278	101,842	212,172	294,584	191,007	205,577	160,440	93,324	**1,635,558**	35.08%
GIFT SHOP	50,587	46,919	74,707	48,620	61,619	74,119	126,570	164,239	113,924	119,231	74,563	71,971	**1,027,069**	22.03%
ED CENTER	37,104	21,279	47,466	48,627	61,560	57,048	55,102	105,396	108,972	121,563	94,068	57,590	**815,775**	17.50%
RUN	10,992	17,840	16,784	34,712	60,416	42,912	53,424	57,670	50,412	65,960	36,072	16,712	**463,906**	9.95%
ACCOM	300	27,762	400	900	0	350	45447	5395	450	0	1100	5020	**87,124**	1.87%
CAFÉ	20,463	12,146	20,754	19,437	22,185	31,605	28,889	42,338	32,495	38,329	26,268	18,094	**313,003**	6.71%
SERENGETI	0	0	0	0	0	0	1,696	0	0	0	0	0	**1,696**	0.04%
BEHIND THE SCENES	0	2,160	7650	5250	8250	9675	5550	18600	10425	12750	6450	4500	**91,260**	1.96%
DONATIONS	1,000.00	1147.95	0	27000	200	0	1200	0	2500	0	352	0	**33,400**	0.72%
SERVICES	6,495	6310	9794	6394	6,630	8180	6905	7115	7295	7180	6510.5	7535	**86,344**	1.85%
Cheese	225	35	175	85	240	280	625	755	310	175	575	120	**3,600**	0.08%
EXCLUSIVE	-	0	14544	0	8080	8080	0	40400	0	8080	16160	8080	**103424**	2.22%
Events sales	-	0	0	0	0	0	0	0	0	0	0	0	**0**	0.00%
TOTAL	**180,398**	**196,464**	**286,104**	**262,431**	**326,458**	**334,091**	**537,580**	**736,492**	**517,790**	**578,845**	**422,559**	**282,946**	**4,662,159**	100.00%
VISITORS	380	309	583	586	790	711	1033	1589	1242	1404	1007	603	10,237	
Avg Exp/ Visitor	474.73	635.81	490.74	447.83	413.24	469.89	520.41	463.49	416.90	412.28	419.62	469.23	455.42	

3. Food Expenses

The number of people eating at CCF differs every day in accordance with the numbers of guests, working guests, volunteers, and interns arriving and leaving.

Table 28 presents the number of lunches and dinners that were cooked each month at CCF's community dining room, the Hot Spot. From January to December 2016, 30,550 meals were cooked at an average of 84 meals per day.

Table 28: Number of meals served at CCF's Hot Spot from January to December 2016.

Meal	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Lunch	1,365	991	1,036	1,075	1,396	1,459	1501	1478	1478	1402	1058	1014
Dinner	1,370	995	1,040	1,087	1,400	1,466	1505	1480	1469	1405	1060	1020
Total	2,735	1,986	2,076	2,162	2,796	2,925	3,006	2,958	2,947	2,807	2,118	2,034
Average/day	88	71	67	72	90	98	97	95	98	91	71	66

Over half of the meals (56.80%) served at the Hot Spot were for CCF staff members. Volunteers and interns represented (31.43%), while Working Guests (WG), Babson Guests (BG), and other guests represented 11.77% (Figure 44).

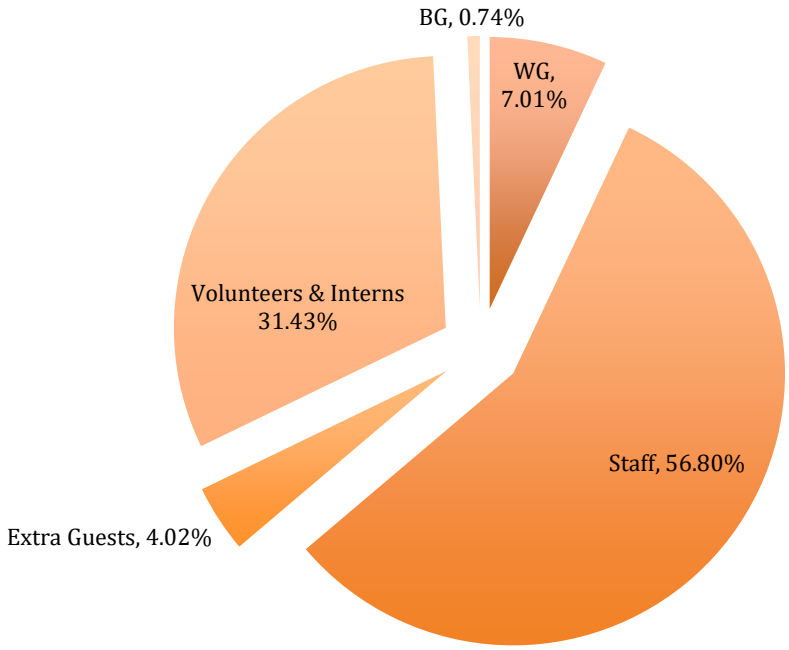

Figure 44: Overall categories of people served at the Hot Spot from January to December 2016.

4. Marketing

For the fourth consecutive year, CCF received a Certificate of Excellence from TripAdvisor in June. This award is given to tourism businesses that consistently receive high ratings from TripAdvisor travellers. Only the top 10% of businesses worldwide on TripAdvisor receive this award.

CCF attended the 18th Annual Namibia Tourism Expo on a joint stand with other members of the Namibian Wine Growers association. At the expo, held from 17 to 22 May 2016, the stand displayed CCF images and promotional materials. CCF staff were present to promote CCF activities such as the Babson House and the Dancing Goat Creamery, along with other initiatives such as the Carnivore Tracker App. On 18 June CCF hosted a site inspection for agents from Namibian Tours & Safaris.

CCF's marketing agent, Exclusive Reservations, continues to support our eco-tourism efforts both with bookings and its objective of transforming the CCF brand to make it distinctive and different. Exclusive Reservations also promotes CCF by regularly visiting other tour operators in Windhoek and organising meetings for companies based in Swakopmund. During this period, Exclusive participated in expos based in South Africa, including Africa's largest travel show, INDABA. Exclusive also organised an educational visit with some of the Namibian tour operators on 29 Feb 2016 to promote CCF and to familiarise the tour operators with CCF's work as an education and research centre. CCF was also represented at the annual HAN conference which took place in November in Windhoek.

Over the course of 2016 CCF has continued its advertising partnerships with numerous publications and online channels. This included; Brochures Namibia, Where to Stay, Namibia Travel Info, Namibia Travel and Holiday and the Namibia Travel Companion.

Attractions that encourage tourism operators to market CCF as a destination continue to be evaluated, as is the information and materials supplied to visitors on departure to encourage them to become engaged and share their experience with their closer and wider networks once they have

returned to their homes. We are actively promoting our social media websites (Facebook, Twitter, Blogger, YouTube, TripAdvisor, and LinkedIn) to all guests visiting CCF.

5. Visitor Attractions

Since a lightning fire on 16 October 2013 destroyed the CCF Visitor Centre, which housed the Cheetah Café, the café continued to operate at the tourism office in the Cheetah Museum building until May 2015, when the Cheetah Café re-opened with a new and improved menu in the new Visitor Centre building with the help of Pupkewitz Catering. Supporting local businesses helped CCF to refurnish the new Cheetah Café.

CCF's famous cheese platters and baked feta are still favourites among customers, as is our ice cream on hot days. To facilitate the effectiveness of the kitchen and the swift movement of customers through the lunch period, CCF offers set menus and buffets to larger groups and pre-booked lighter meals as well as cake and coffee. Increasingly, large groups are booking lunches at the Café, including many repeat customers such as the Mambaruri and Karibu tour groups.

Sales at the Cheetah Café for January to December 2016 totalled N$313,003.00 (Table 29). The lowest sales this period were during February and December, which correlates to the months with lowest visitor numbers. Efforts continue to increase the number of booked lunches.

Table 29: Cheetah Café sales from January to December 2016 (N$).

Month	Pre-Booked	A la Carte	Total
January	5,590.00	14,873.00	**20,463.00**
February	0	12,146.00	**12,146.00**
March	1,430.00	19,324.00	**20,754.00**
April	3,250.00	16,187.00	**19,437.00**
May	4,940.00	17,245.00	**22,185.00**
June	8,320.00	23,285.00	**31,605.00**
July	5,330.00	23,559.00	**28,889.00**
August	13,650.00	28,688.00	**42,338.00**
September	11,050.00	21,445.00	**32,495.00**
October	12,290.00	26,039.00	**38,329.00**
November	13,310.00	12,958.00	**26,268.00**
December	1,040.00	17,054.00	**18,094.00**
Total Sales	**80,200.00**	**232,803.00**	**313,003.00**

E. Association and Conservancy Relationships

1. Large Carnivore Management Association (LCMAN)

CCF is a founding member of LCMAN and continues its work as a stakeholder of this group of NGOs, researchers, farmers, and governmental departments. Additionally, since 2014, Dr Marker has served as LCMAN's Chairperson. LCMAN helps guide the conservation and management of large carnivores in the country and facilitates communication among the stakeholders to ensure a coordinated approach. This association further functions as a resource for the Namibian MET to provide expert advice and guidance during policy making procedures. LCMAN is now in its 20th

anniversary year and despite being still small in membership and finances, the Association is proud of the work that has been accomplished by all its members, students, MET and partners around large carnivore conservation in Namibia.

Two meetings were held during March and June with much success. There was a good representation from member organisations and some of the issues discussed included looking into growing the LCMAN membership and developing proposals and sponsorship letters to raise funds.

LCMAN AGM 22 November 2016

There are currently eight full voting LCMAN members that include NamibRand Nature Reserve, Africat Foundation, Leibnitz Institute for Zoo and Wildlife Research (IZW), Erindi Game Reserve and CCF. There are an additional seven associate members, including Conservancies Association of Namibia (CANAM) / Namibia Agricultural Union (NAU), Kiripotib Collection, Kwando Carnivore Project, Brown Hyena Project, and Ongava Research Centre. Dr Laurie Marker and Tammy Hoth were re-elected as Chair and Vice Chair respectively and Nils Odendaal was nominated to take over the treasurer duties and he had no objections. There were no challenges from any members. The Namibia Nature Foundation reported back on the proceedings from the CITES CoP17 held in South Africa (24 September to 5 October 2016).

Carnivore Tracker App Project

Sightings have been reported across Namibia from September 2015 until present day, as of 9 January 2017, we have captured 28 out of the 33 carnivore species in the country, in total 88 users have captured 697 verified sightings have been captured (Table 30, Figure 45). Information on carnivore tracker was given out to members at the Hospitality Association of Namibia conference in Windhoek (17–18 November 2016). Air Namibia is playing the edited version by Friendly Human of the carnivore tracker video from the 1 September 2016 to the end of February 2017. Carnivore Tracker has a new website, www.carnivoretracker.com, where people can download the App as well as request the data produced by Carnivore Tracker for their research projects. All sighting records to date have been sent into the EIS Carnivore Atlas, which is an ongoing process.

Table 30: Shows all the species captured on Carnivore Tracker as of 9 January 2017 and the number of sightings per species.

Species (28 of 33)	Number of sightings
Aardwolf	35
African Civet	2
African Wild Cat	13
Banded Mongoose	63
Bat-eared Fox	56
Black Mongoose	9
Black-backed Jackal	198
Brown Hyena	32
Cape Clawless Otter	2
Cape Fox	4
Caracal	18
Cheetah	31
Dwarf Mongoose	1
Honey Badger	11
Large-spotted Genet	9
Leopard	38

Lion	55
Meerkat	4
Selous's Mongoose	6
Slender Mongoose	27
Small Grey Mongoose	1
Small-spotted Genet	16
Spot-necked Otter	8
Spotted Hyena	26
Striped Polecat	4
White-tailed Mongoose	1
Wild dog	11
Yellow Mongoose	16
TOTAL	**697**

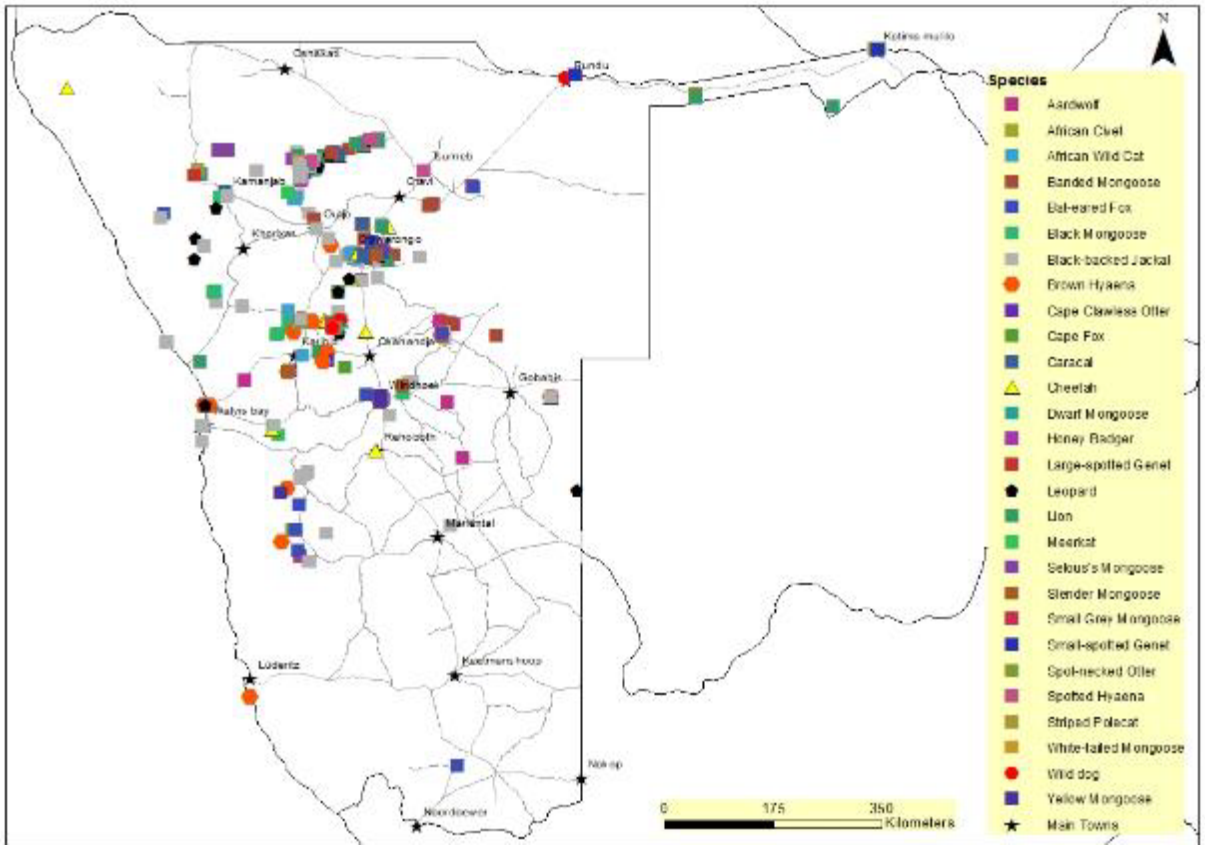

Figure 45: Carnivore sightings captured across Namibia through Carnivore Tracker App. from 1 September 2015 to 9 January 2017.

As CCF staff and volunteers have had access to the App for nearly two years (testing and release), a high number of Carnivore Tracker sightings between CCF and Otjiwarongo has been recorded (Figure 46) and just on CCF farmland (Figure 47).

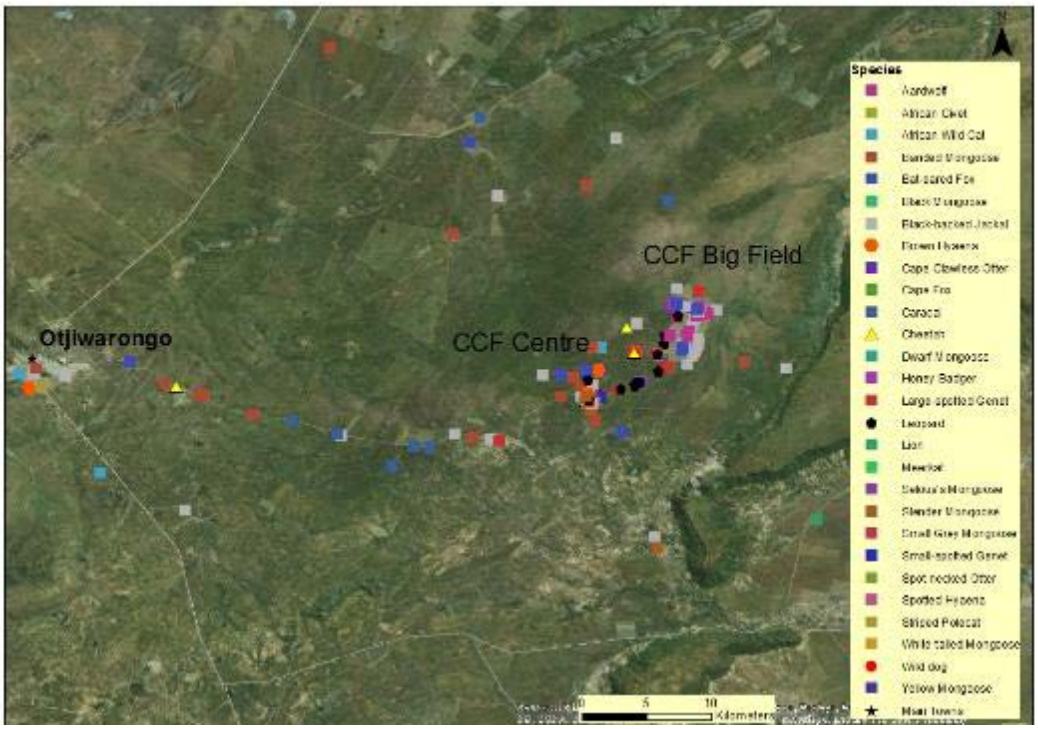

Figure 46: Carnivore Tracker sightings between Otjiwarongo and the CCF Centre.

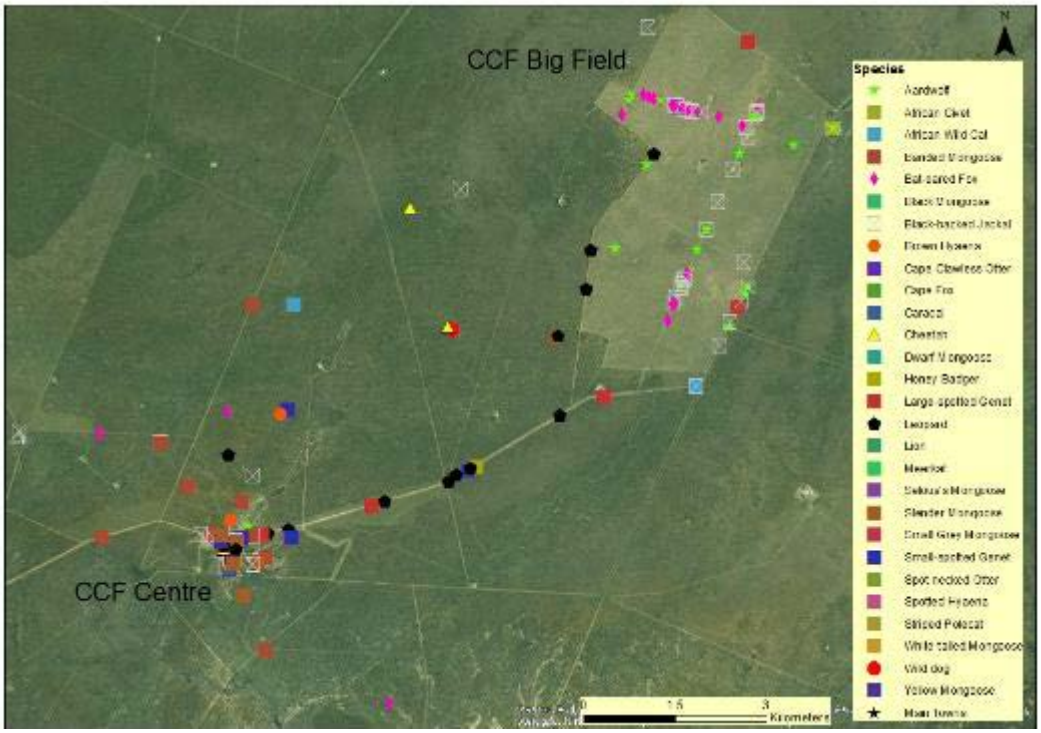

Figure 47: Carnivore Tracker sightings captured on CCF farmland.

New features of Carnivore Tracker (Figure 48), which were released in August 2016, include an interactive sighting locations to show distribution, a 'My Sightings list' for each user so all their personal sightings are recorded, and additional information on each species was added including a fun fact about each one, e.g., an aardwolf can eat up to 200,000 termites a night.

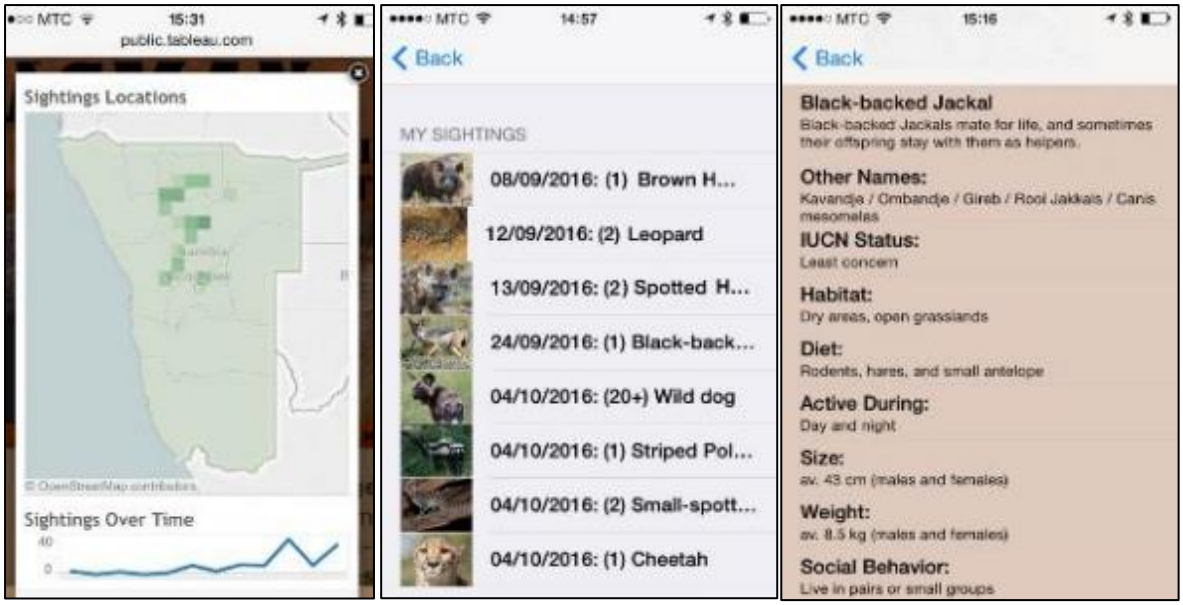

Figure 48: Shows the three new features added to carnivore tracker in August 2016.

2. Conservancy Association of Namibia (CANAM)

This year CANAM held their AGM on 7 April. CCF's Ecology Manager, Dr Louisa Richmond-Coggan, attended and presented information about the Waterberg Conservancy, Carnivore Tracker Mobile App. and the GWL. CANAM is supporting Carnivore Tracker by sending out information several times to all their members. In the latter half of 2016 CANAM did not undertake any further activities.

3. Waterberg Conservancy

The Waterberg Conservancy, of which CCF is a founding member, held its AGM on 25 May 2016, with the attendance of Dr Laurie Marker and Dr Louisa Richmond-Coggan. Members unanimously re-elected Mr. Harry Schneider-Waterberg as chairman and Mrs. Sonja Schneider-Waterberg as secretariat/treasurer. In the latter half of 2016 the Waterberg Conservancy did not undertake any further activities.

4. Greater Waterberg Landscape (GWL)

CCF's International Field Research and Education Centre neighbours the Waterberg National Park, which is within the GWL, an area encompassing 1.77 million hectares, including the Eastern Communal lands in the Okakarara constituency. CCF is a founding member of the GWL and serves on the steering committee. In 2012, the GWL received support from NAMPLACE, a 5-year project under MET funded by the Global Environmental Facility (GEF) and through the United Nations Development Program (UNDP). The GWL is one of five landscapes in Namibia being developed through the 5-year development grant. NAMPLACE is responsible for selecting and implementing developmental projects that will benefit the community, satisfy the needs of the people, and assist in the progression of the region.

CCF was selected by the NAMPLACE steering committee to implement a needs assessment survey for the project encompassing several conservancies and commercial farms within the GWL. The survey was conducted in November 2012, after which CCF analysed the data and presented the results to the GWL leadership in January 2013. As a member of the GWL with ecological and research expertise, CCF is playing a key role in the implementation of the various recommendations and action plans resulting from the survey, including habitat restoration, reintroduction of wildlife

into the target area, training of integrated wildlife and livestock management, and alternative livelihoods training including tourism and crafts development skills. When fully operational, these communities will be empowered to manage and develop their livestock and wildlife resources, restore their land to productive use, and promote tourism.

During this reporting period, CCF attended three GWL meetings. The first AGM meeting on 29 August 2016 was cancelled due to low attendance and a quorum was not reached. The agenda was completed in the next GWL AGM meeting on 27 of September; however, the attendees felt they lacked enough preparation time to vote for the three positions of office. The third AGM meeting and elections were held on 18 October 2016 with sufficient quorum per the constitution. Harry Schneider-Waterberg became the election officer. The results of the elections were as follows: Abiud Kandinda continues as the Chair, Manfred Tjikurame is now the Vice Chair and Dr Louisa Richmond-Coggan (CCF) is now the Secretariat.

In collaboration with B2 Gold Mine, CCF and NAMPLACE, four pre-fab office units, outside toilets and fencing have been set up in each of the four GWL communal conservancies (Okonjatu, Okakarara, Ongongoro and Okamatapati) as offices for the conservancy manager (Figure 49). This creates an official point in all four communal communities for reporting and committee administration.

Figure 49: Completed office buildings and outside toilet in Okonjatu.

Jessica Smith, a UNDP consultant, is undertaking a review of the 5-year NAMPLACE project across Namibia, including for the GWL. Jessica has visited and spoken to all relevant stakeholders. The report will be disseminated to all members when completed.

5. Namibia Professional Hunting Association (NAPHA)

CCF once again was invited to NAPHA's 2016 AGM held on 30 November. The Association's new President is Danene van der Westhuyzen. CCF continues to be a supportive member of NAPHA's goals and stance on ethical hunting across Namibia. We were encouraged by NAPHA's stance on sustainable utilisation of wildlife in conjunction with the conservation of large landscapes across Namibia. CCF continues to ask for support from NAPHA by requesting information about presence and absence of cheetah and leopard throughout the farmlands. We also ask for location of sightings, and whether the animals are killed as problem animals or trophies, in order to substantially increase the amount of information we receive on where the problems occur and the numbers being removed.

CCF asked NAPHA to assist with distribution of the Carnivore Tracker App; consequently, CCF was invited to present to the NAPHA members on the status of App and how their members can help with collecting sightings. CCF also requested that NAPHA's President communicate with hunters

across Namibia to help us collect genetic samples from hunted cheetahs, in particular, and other predators.

6. The Namibian Association of Community Based Natural Resource Management (CBNRM) Support Organisations (NACSO)

As CCF is a member of NACSO, through 2016 CCF's Dr Louisa Richmond-Coggan has been attending meetings. The focus for 2016 has been the writing and finalisation of NACSO's new 5-year strategy plan (2017–2021) to include feedback and suggestions from all members. NACSO has also launched a new website, which is more interactive and allows for easier access to the event book information gathered from game guards from around Namibia on human-wildlife conflict, finances, management and tourism. On 1 December 2016, CCF was invited to present an overview of its work with the Eastern communal conservancies (Hereroland), past, present and future. The information presented was well received as it gave the members a better understanding of the depth and width of research activities being undertaken across the landscape.

7. The Ministry of Environment and Tourism (MET)

In 2016 the Ministry of Environment and Tourism has undertaken consultancy meetings across the different regions of Namibia to gather information from stakeholders and community to be inputted into their new 5-year human-wildlife conflict strategy policy document 2017 - 2021. CCF was invited to the meetings taking place in Okakarara for the Otjozondjupa region, and was represented by Dr Louisa Richmond-Coggan and Tarik Bodasing. This enabled CCF to be at the heart of the process and input key information to ensure the long-term survival of carnivores across Namibia. A 2-day final meeting was planned for November 2016 but has been delayed until February 2017. CCF has been requested to present our long-term research on human-carnivore conflict with a focus on the eastern communal areas.

8. Urban Dynamics – Regional Land Use Plan

Throughout 2016 CCF was invited to the meetings taking place in the Otjozondjupa region, and represented by Dr Louisa Richmond-Coggan and Tarik Bodasing. This enabled CCF to provide input into the regional land use plan for our region to ensure that wildlife conservation and large open landscapes were included in the planning process. The aim of the workshops was to use the information provided to prepare sub-regional land use plans, combine these plans into a concept regional land-use plan, consider conflicts and deal with them, and discuss policy and regulatory requirements to support the plan. Key areas of discussion included but were not limited to illegal fencing, human-wildlife conflict, differing farming activities, conflict between commercial and re-settlement farms, bush encroachment, water resources, and mining.

F. Global Management Planning/Policy Involvement

CCF assists in international programme development and adapts model programmes developed in Namibia for use in other countries, distributing its materials and information throughout Africa and the rest of the world.

1. International Cheetah Studbook

Dr Laurie Marker is the International Cheetah Studbook Keeper. The International Cheetah Studbook is a voluntary register of all cheetahs in the world held in both zoological and private facilities, and providing information about existing animals by publishing the studbook contents, thus creating the

preconditions for selecting breeding animals. The Studbook records captive animals from around the world. It includes wild-caught and captive-born individuals alive in 1980 and after, as well as founders with live offspring since 1980. Each registered animal has a studbook number. Bi-annual questionnaires are sent to all facilities holding cheetah and information is checked through support of the International Species Inventory System (Species360) and personal communications. Each registered animal has a studbook card.

The 2016 studbook is currently in preparation. The 2015 studbook was completed and distributed in October 2016. From 1 January 2015 to 31 December 2015, 247 (102.112.33) new animals were registered, representing births and newly imported wild-caught animals during this period, as well as animals that had been brought into the captive population prior to 1 January 2015, but had not been reported until after the publication of the 2014 Studbook. Captive-born cubs from known breeding facilities totalled 216 (87.99.30), born in 64 litters in 27 facilities in 10 countries. The captive cheetah population on 31 December 2015 was 1762 (889.859.14) animals in 283 known facilities in 48 countries (Figure 51).

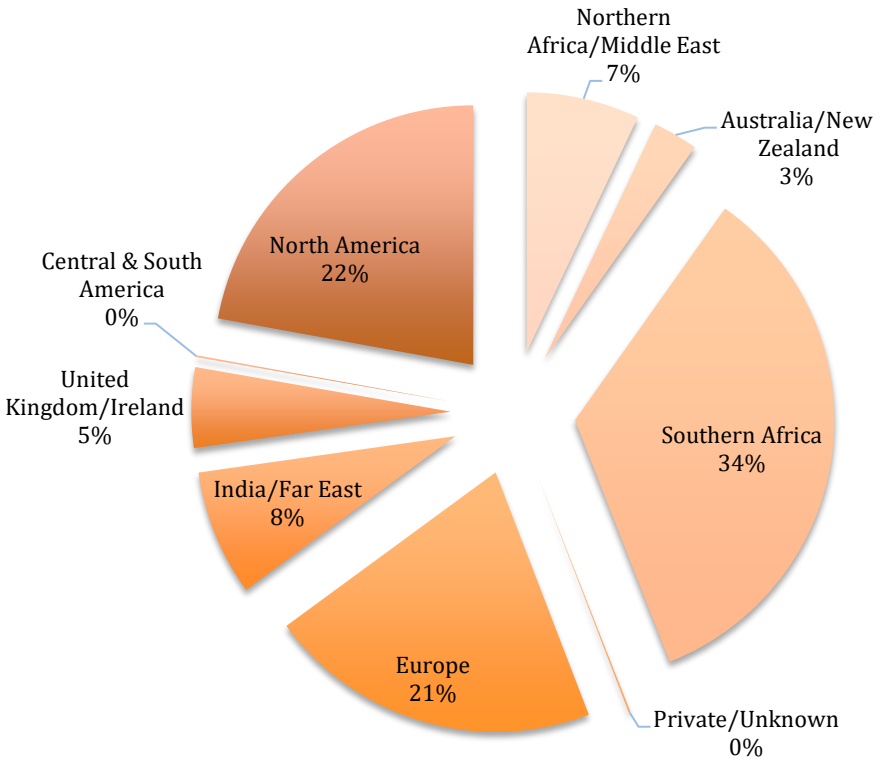

Figure 50: 2015 Captive Cheetah Population by Region, 1762 (889.859.14) Cheetahs.

2. International Meetings and Collaborations

Education Association of South Africa (EASA) Conference – South Africa, January 2016

CCF's Education Manager, Stephanie Bradley, attended the 2016 Education Association of South Africa (EASA) Conference held in Cape Town on 17-20 January 2016. The conference focused mainly on exploring ways to reinforce and facilitate learners' access and success by addressing educational inequalities and student support.

European Pellet Conference – Austria, February 2016

In February, Dr Bruce Brewer attended the European Pellet Conference, which took place in Austria from 24 to 26 February 2016 in Wels, Austria and is the largest annual pellet event worldwide. Dr Brewer gave a presentation about CCF's Bushblok project with the title "Namibia: Biomass Opportunities".

1st Australian Cheetah Workshop - March 2016

The first Australian Cheetah Workshop was held at the Monarto Zoo on 6-7 March, where professionals from Australia and New Zealand came together to learn more about cheetahs. The workshop was a co-operative effort between CCF Australia, Dr Laurie Marker, as well as Michelle Lloyd (Carnivore Keeper) and Jaime Foote (Keeper) from the Monarto Zoo. Dr Marker gave several presentations about various topics including cheetah husbandry, nutrition, breeding, genetics, population management, and diseases.

55th Annual AIVPA Congress – Italy, May 2016

Dr Marker was invited to be a speaker at the 55th Annual Congress of the AIVPA Association (Italian Vet Association for Small Animals) held in Ancona, Italy on the 6-7 May 2016. Dr Marker gave a presentation titled, "My life with cheetahs: running against extinction." She was accompanied by Elisabetta von Hoenning, the president of the newly-founded Cheetah Conservation Fund Italia, and CCF Italia members Matilde Venturi and Domenico Marrali, as well as her Assistant Teresia Robitschko.

International Biorefining Week – Sweden, May 2016

Dr Brewer attended the International Biorefining week, which took place in Stockholm, Sweden at the end of May. The International Wood Biorefining Week is the leading international event for wood based biorefining industries, and gave Dr Brewer the opportunity to talk with colleagues about the potential of the industrial use of Namibian biomass.

Course "Recent Advances in Conservation Genetics" – Hungary, June 2016

Dr Anne Schmidt-Küntzel, was a speaker and lecturer at the course "Recent Advances in Conservation Genetics" ConGen 2016, held in Hungary in June 2016. The title of her presentation was "The Cheetah *(Acinonyx jubatus*): cheetah conservation and the status of cheetah genetics" and the title of her lecture was "Microsatellites & the use of non-invasive samples in conservation genetics".

17th CITES Conference of the Parties (CoP17) – South Africa, September-October 2016

Dr Laurie Marker and Patricia Tricorache, CCF's Asst. Director, Strategic Communications & Illegal Wildlife Trade, attended CoP17 from 24 September to 5 October in Johannesburg, South Africa. Cheetah trafficking was one of the items on the agenda and the feature of a side event organised by CCF and its partner, the Range Wide Conservation Program for Cheetah and African Wild Dog (RWCP). All decisions were unanimously adopted. More details about CoP17 can be found in Section F.3. Illegal Wildlife Trafficking (IWT) below.

Energy DeCentral – Germany, November 2016

Dr Bruce Brewer attended the Energy DeCentral Trade Fair, which took place from 15 to 18 November 2016 in Hannover, Germany. This is the international trade fair for innovative energy supply, and the latest trends and international developments were presented.

Cheetah Stakeholders Workshop – Ethiopia, December 2016

Dr Laurie Marker and Patricia Tricorache, CCF's Asst. Director, Strategic Communications & Illegal Wildlife Trade participated in a Cheetah Stakeholders Workshop held in Addis Ababa, Ethiopia, from 9 to 11 December 2016. The workshop, organised by CCF and IFAW (International Fund for Animal Welfare), was specifically designed to develop a framework for a partnership project to counter cheetah trafficking in the Horn of Africa and the Arab Peninsula. Participants included experts from the governments of Ethiopia, Somalia, Djibouti and the Somaliland region, as well as various NGOs, Following the workshop, Patricia stayed over for press interviews and lectures organised by the US Embassy in Ethiopia. More details about CoP17 can be found in Section F.3. Illegal Wildlife Trafficking (IWT) below.

4th HAWEN Steering Committee Meeting – Ethiopia, December 2016

During the Cheetah Stakeholders Workshop in Ethiopia, Dr Marker and Patricia attended the 4th Horn of Africa Wildlife Enforcement Network (HAWEN) Steering Committee Meeting on 7-8 December in Addis Ababa, Ethiopia. HAWEN, still in its organisational stages, is a regional initiative to combat illegal wildlife trafficking. SC members include high-ranking government from the region, as well as NGO representatives, providing CCF with an opportune to raise awareness about the importance of including illegal cheetah trade in their work.

3. Illegal Wildlife Trafficking (IWT)

CCF first became actively involved with issues involving the illegal taking of live animals in November 2005, when it arranged for the confiscation of two extremely unhealthy cheetah cubs being held in ropes outside a restaurant in Ethiopia. Since then, CCF's Assistant Director for Strategic Communications and Illegal Wildlife Trade, Patricia Tricorache, has been monitoring illegal cheetah trafficking and organising confiscations through the proper authorities whenever possible. Even though the intrinsic nature of IWT makes it difficult to collect full or reliable information, CCF has knowledge of nearly 2,000 cheetahs involved in illegal wildlife trade cases gathered between direct reports and media articles. Although geographically widespread, most of the cases compiled by CCF involve the Arabian Peninsula and the Horn of Africa (HoA), where CCF has a broader network.

During 2016, CCF compiled 34 reports of illegal cheetah trafficking involving at least 167 cheetahs (Figure 51). Twenty-six of these cheetahs were confirmed dead, including 19 confiscated as skins or

heads, 21 were confirmed alive at the time the reports were received, while the fate of 120 is unknown. Of the latter, 71 were reported as being offered for sale in Yemen, 52 were reported as being offered for sale in Somaliland/Somalia and the UAE, and eleven in Ethiopia. Any information CCF is able to obtain regarding cubs offered for sale is forwarded to relevant authorities. Of the 21 cheetahs believed to be alive as of 31 December, one is a pet in Saudi Arabia reported as lost, five were confiscated in Ethiopia (2), Oman (1), Qatar (1) and Somaliland (1); one adult cheetah was offered for sale by his owner in Al Ain (UAE), and 14 are under investigation in Somaliland.

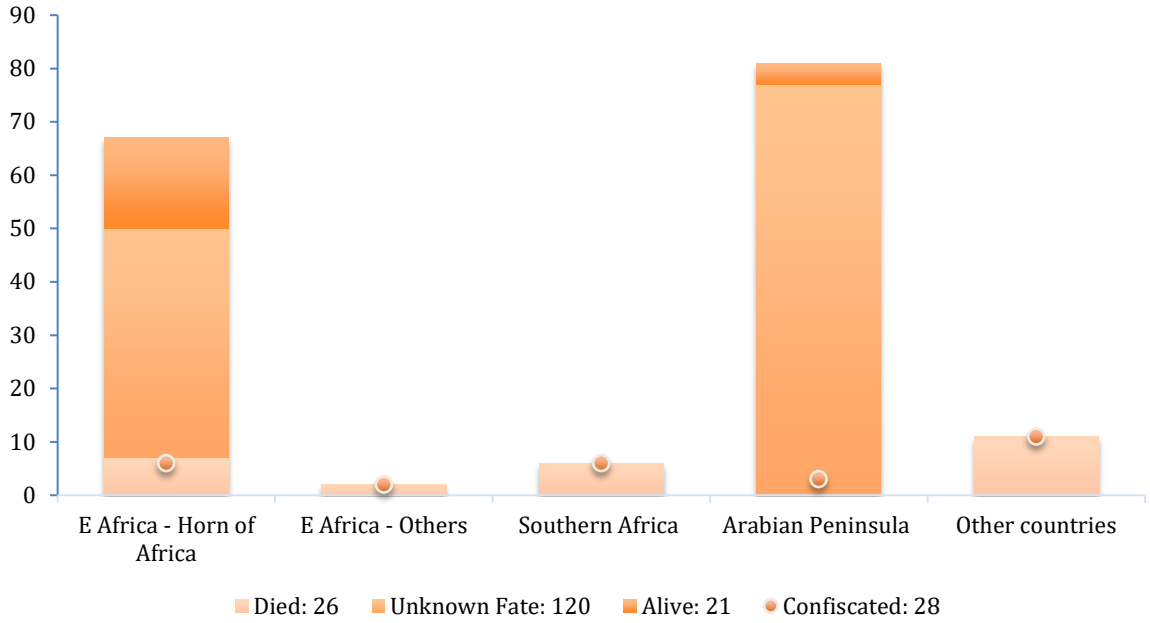

Figure 51: Summary of illegal cheetah trafficking by geographic region from January to December 2016.

The HoA region continues to be of major concern due to political and economic factors that make enforcement more difficult, as well as its proximity to the Arabian Peninsula, where demand for exotic pets remains constant. With few exceptions in past years, attempts by CCF and its network to confiscate cheetahs continue to be mostly unsuccessful. The Somaliland Minister of Environment and Rural Development, Hon. Shukri Haji Ismail, had expressed to CCF and BFF the need for law enforcement personnel training, and the establishment of a long-term facility for confiscated animals in her country. To this effect, CCF assessed the viability of a private facility planned by another of CCF's contacts in Somaliland; however, concerns over safety, staffing and the ability to obtain provisions have kept the project on hold. Discussions on this issue are expected to continue in 2017.

Our ability to work in Somaliland was affected by the departure of CCF's main contact, which made communications and reports more difficult to obtain. However, he returned to Somaliland in April 2016, after which 10 reports involving 33 cheetahs were received, and one successful confiscations was made.

In September 2015, CCF carried out a month-long research of cheetahs offered for sale on social media and submitted a list of nearly 150 names to CITES, INTERPOL and authorities in relevant countries. This research is now ongoing and in close collaboration with PEGAS (Project to End Great Apes Slavery). Information is continuously shared with relevant authorities. When appropriate and without hindering official investigations, CCF also alerts NGOs working on other endangered species found on the advertisements, e.g. chimpanzees, orangutans, gibbons and clouded leopards. Through 31 December, over 200 dealers have been added to the database. CCF also began a count of cheetahs offered for sale by the identified dealers. This investigation is ongoing, and by the end of

December 2016 comprised over 1,000 cheetahs over a period of four years of recorded advertisements.

The CCF team also continues to make every effort to collect genetic samples from cheetahs in the UAE and HoA, under the proper CITES permits, for a DNA database that might allow us to identify their geographic origin in support of trafficking investigations. The samples are brought and stored in Namibia. No samples were collected during this period.

Public Policy

CITES

Following a resolution at the CITES 16th Conference of the Parties (CoP) held in Bangkok in March 2013, the CITES Secretariat commissioned an independent study of 'both the legal and illegal trade in wild cheetahs, and to assess the impact of this trade on the species' conservation in the wild'. The study, which included data provided by CCF, was presented at the CITES 27th Animal Committee Meeting and subsequently reviewed during the 65th Standing Committee (SC65) Meeting, both held in 2014. At SC65, an Intersessional Working Group on Illegal Trade in Cheetahs was formed and subsequently joined by CCF, represented by Patricia Tricorache.

The group was tasked with the design of a questionnaire to CITES Parties requesting information on national legislation and enforcement, as well as with the organisation of a workshop with relevant CITES parties and NGOs. The workshop was held on 3-5 November 2015, hosted by the State of Kuwait, and was attended by 13 Parties and 10 NGOs. Recommendations resulting from this workshop, which include demand reduction programmes, increased enforcement and communications, and disposal procedures, were submitted and adopted with minor changes at the SC66 meeting held in Geneva in mid-January. In addition, decisions that included the establishment of a Cheetah Trade Resource Kit and a Cheetah Forum, subject to funding, were tabled for discussion at CoP17, which took place in September 2016 in Johannesburg. Dr Laurie Marker and Patricia attended CoP17 and, in preparation for this important event, organised with its partners a side event to share information about the importance of supporting the adoption of the tabled decisions on the eve of the Committee meeting. All decisions were adopted. An important decision for the CITES Secretariat to engage internet platforms to combat online trade in cheetahs and raise awareness was also adopted at COP17. However, as a result of joint reports submitted by CCF and PEGAS on cheetahs and great apes offered for sale on social media, the decision was adopted as part of the overall cybercrime topic, and thus the Secretariat's efforts will be expanded to all CITES species and become a part of the regular Enforcement matters agenda.

Regional Cheetah Stakeholders Workshop - Ethiopia

Following the adoption of all decisions relevant to cheetah at CoP17 on 4 October, CCF and IFAW (International Fund for Animal Welfare) agreed on the urgency of holding a regional cheetah stakeholders workshop to delineate strategies and priorities to support such decisions. On 9 December, experts in enforcement and wildlife conservation met in Addis Ababa, Ethiopia, for three days. The workshop, attended by government representatives from Ethiopia, Somalia and Somaliland, as well as IUCN, Colorado State University, IFAW, the Born Free Foundation's Border Point Project, DECAN Djibouti and CCF, resulted in a set of strategies and actions that will be part of an illegal cheetah trafficking blueprint currently in preparation. Following the workshop, Patricia remained in Ethiopia for a press conference and lectures to members of the American Center in Ethiopia and the Mandela Young African Leaders Initiative. These events were organised by the US Embassy's Regional Environmental Office for East Africa in support of their newly-launched

awareness campaign targeting the illegal trade in wild cheetahs across Ethiopia and Somalia to the Middle East.

Other Meetings

Dr Laurie Marker and staff take every opportunity to network with government institutions, and monitor important issues and government policies that affect the cheetah. Following are some of the events on IWT attended by CCF.

- On 2 March, Susan Yannetti of CCF USA staff attended an event in recognition of World Wildlife Day (WWD) 2016 at the U.S. Department of State. The programme focused on the question of how to raise public awareness internationally about wildlife trafficking.

- On 25 April, Dr Marker and Senator Jeff Flake (R-Arizona), Chair of the Senate Foreign Relations Subcommittee on African Affairs presented a joint briefing on Capitol Hill to raise awareness for the cheetah and generate support for Flake's END (End, Neutralize, Disrupt) Wildlife Trafficking Act, H.R. 2494, which subsequently passed Sept. 15, 2016.

- On 10 May, as part her spring tour in the UK, Dr Marker had an introductory meeting with United for Wildlife, a Duke of Cambridge initiative. Dr Marker had an opportunity to share concerns about the threats that illegal pet trade pose to cheetah conservation. During this visit, Dr Marker also had a courtesy meeting with CCF's IWT partner, the Born Free Foundation.

- On 21 June, Jane Galton, head of CCF UK, attended a CITES Conservation NGO Liaison Group (CLG) Meeting hosted by the UK Department of Environment, Food and Rural Affairs. Ms. Galton had the opportunity to raise awareness about illegal cheetah trafficking, as their focus has been on elephants, rhinos, lions and pangolins. The head of the DEFRA UK CITES commented that it is only relatively recently that the illegal trade in cheetahs is moving up the agenda.

By attending these meetings, CCF staff is able to share current information on challenges, obstacles, and programmes that might impact recommendations.

In its efforts to raise awareness and ensure that illegal cheetah trade is considered in all actions relevant to wildlife trafficking, CCF entered into an information sharing agreement with TRAFFIC, so that cheetah data can be integrated into TRAFFIC's extensive database. CCF handed all its existing data over to TRAFFIC during the CITES CoP17 in September. CCF has also approached IFAW, publisher of two major online wildlife trafficking reports in order to consolidate its data with theirs.

Elsewhere, CCF continues to be approached by and collaborating with various international conservation and enforcement NGOs researching IWT, and pro-actively approaches government agencies, groups and individuals dedicated to collecting information and training enforcement agencies to fight the trade. Efforts such as these enable CCF to create synergies that may result in successful actions, and to raise awareness to the urgency of addressing the illegal trade of live species as a whole, and not species specific.

Media

The inclusion of cheetahs in an international forum such as CITES has resulted in important media attention, which is a crucial element to raise awareness about illegal cheetah trafficking. Highlights include:

- Through the efforts of CCF UK, Dr Marker and Patricia Tricorache were interviewed by the BBC (UK) for a special report on illegal exotic pets in the UAE, which ran on BBC World and BBC1 on 23 September 2016, leading to CoP17.
- On 28 September, before the cheetah side event at CoP17, the British TV station aired an interview with Dr Laurie Marker.
- On 4 October, VICE Media published an interview with Patricia addressing the illegal trade in cheetahs on Instagram following the adoption in Plenary of the CITES decisions.
- A feature article on illegal cheetah trafficking published by the Kenyan magazine, the East African, on 24 December.
- On 29 December, EBD (Ethiopia Broadcasting Corporation) aired a 20-minute interview with Patricia in connection with the Cheetah Stakeholders Workshop.

CCF also submitted a short article on IWT at the request of Dr Marker's *alma mater*, University of Oxford's Lady Margaret Hall. The article was published on their web site on World Environment Day.

Social Media

Social media is a tool commonly utilised by wildlife dealers, and their images of animals being offered receive many compliments and "likes" by thousands of people. With this in mind, and considering that CCF's most popular post on its Facebook page in 2015 was relevant to IWT, we launched a new Facebook page titled, "So you want a pet cheetah?" on 30 December 2015. The page aims to raise awareness on social media about the threat that illegal cheetah trafficking represents to the survival of the species by providing information about the trade, and about actions being taken, hoping to turn public opinion against ownership of cheetah pets and, in particular, to reach those who might own or plan to buy a cheetah. The page also invites people to contact CCF privately with any reports of illegal cheetah trafficking, and in June received its first report about a possible cheetah dealer in the Middle East.

During its first year, the page "likes" increased from 183 to 867, with an initial spike in "likes" of 109% during the first week from launch, after which growth has been steady at 2-4 "likes" per day. "Likes" are distributed among 57 countries, with the majority being from the US (33%), followed by the UK (8%) and Italy, France and Lebanon (5% each). The page has reached an average of 396 unique users per day through 121 posts. The single most popular post during this period was a short in-house, 2-minute video about a cheetah rescued in Somaliland. The post reached 8,220 organic users. This was followed by two other good-news posts: the new environmental law in Somaliland and the rescue of the cheetah also in Somaliland, with 4,764 and 4,196 users, respectively.

.

V. Education

Public education and the development of an active grassroots constituency are integral components of CCF's overall cheetah conservation programme. CCF educates farmers, students, educators, public-policy makers, and the public in general on the value of sustainable practices in conservation, as well as on the importance and value of predators for a healthy ecosystem. Public education and the development of national pride in the cheetah are both critical to its survival.

CCF continues to host school groups of all ages at Camp Lightfoot and visit schools as part of its outreach programme. CCF also continues to provide in-house training to Namibian students and to host national and international students and interns.

CCF is a member of the Museum Association of Namibia (MAN), an umbrella organisation that represents all the museums in Namibia. It provides training workshops for individual museums and regional museum development workshops for regions that currently do not have any museums. In June, Education Manager, Stephanie Bradley, attended the MAN's AGM held in Windhoek. The meeting provided an opportunity to discuss MAN's three-year plan and grant projections. Stephanie also represented CCF at the 2016 Education Association of South Africa (EASA) Conference held in Cape Town in January 2016.

In October, our Education Officer, Ignatius Davids, completed the USAID-funded WESSA National Certificate in Environmental Education, Training and Development Practice (EETDP) in Johannesburg, South Africa. The course outlined how to implement best practices in teaching school youth and young adults. Participants were able to explore new methods of facilitating, designing and evaluating environmental learning programs. Thus, Ignatius can utilise more fluent facilitation methods by gauging groups' needs and whether to implement learner-centred approach or teacher-centred approaches.

A. Future Conservationists of Africa

In 2016 the CCF Education team reached over 11,000 Namibian children and youth through school outreach and centre-based programmes.

1. School Outreach

School outreach started in February this year with the help of the entire education team taking turns visiting schools. Thirty-four schools were visited during this period as part of CCF's outreach programmes. A total of 9,848 students learned about cheetah behaviour, ecology, and how people can help conserve the cheetah during 45-minute presentations by the CCF staff.

- In February and March, the CCF team conducted outreach at 21 schools in the Otjizondjupa, Oshikoto, and Khomas Regions (Otavi, Tsumeb and Windhoek), reaching 6,435 students in grades 5 to 12.

- In April and June, the education team travelled to the Erongo and Otjozondjupa regions (Omaruru, Otjiwarongo and Okakarara) to impart conservation education programmes at 12 schools, involving 2,913 students in grades 0 to 7.

- In September, the education team travelled to Grootfontein where it reached an additional 500 students.

2. Centre-based Programmes: Primary to High School

Organised education programmes at CCF involved 31 Namibian groups (1,233 children and youth, accompanied by 178 teachers, parents, or volunteers) (Occasionally, day groups cannot be hosted overnight due to group sizes (sometimes over 50 or 60 children), kids' age, or overlapping dates. In 2016, day programmes involved 24 groups (1090 children and youths with 151 teachers, parents, or volunteers).

Table 31). Of these, seven groups (143 children and youth with 27 teachers, parents, or volunteers) participated in overnight programmes at CCF's Camp Lightfoot or Cheetah View. Depending on the length of stay and the group focus, activities included cheetah runs, museum tour, guarding dog and goat kraal talks, predator kill identification exercises, 'preyground' activities, ecological talks, and game drives.

Occasionally, day groups cannot be hosted overnight due to group sizes (sometimes over 50 or 60 children), kids' age, or overlapping dates. In 2016, day programmes involved 24 groups (1090 children and youths with 151 teachers, parents, or volunteers).

Table 31: Namibian schools hosted by CCF from January to June 2016

Namibian Overnight School Groups

Date In	Date Out	School	Learners	Adults	Total
19 Mar 16	21 Mar 16	Gammams Primary School	30	2	**32**
01 Apr16	03 Apr 16	Gammams Primary School	30	2	**32**
01 Jul 16	03 Jul 16	MH Greef Primary School	24	3	**27**
08 Jul 16	10 Jul 16	Eldorado High School	6	2	**8**
16 Aug 16	19 Aug 16	Osire Secondary School	8	7	**15**
01 Sep 16	02 Sep 16	Makalani Private School	31	5	**36**
24 Sep 16	26 Sep 16	Trainoccasion Primary School	14	6	**20**
	Total Namibian Overnight School Groups:		**143**	**27**	**170**

Namibian Day Visit School Groups

Date	School	Learners	Adults	Total
10 Feb 16	Monotronics College	28	12	**40**
28 Apr 16	Children of Zion Mission School	51	7	**58**
30 Apr 16	Ediva Primary School	50	8	**58**
10 May 16	Andimba Toivo ya Toive Secondary	69	4	**73**
17 May 16	Kayec Community Centre	26	5	**31**
27 May 16	Onesi Senior Secondary School	70	5	**75**
15 Jun 16	Otjiwarongo Montessori Preschool	15	5	**20**
16 Jun 16	Outjo Secondary School	51	8	**59**
13 Jul 16	Andimba Toivo ya Toivo Secondary	28	2	**30**
16 Jul 16	Kronlein Primary School	85	25	**110**
29 Jul 16	Brandberg Primary School	52	5	**57**
15 Aug 16	Ama !Gorases Pre-Primary School	31	7	**38**
21 Aug 16	Hoeksteea Primary School	71	8	**79**

22 Aug 16	Ponhofi Senior Secondary School	51	3	**54**
23 Aug 16	Swakopmund Primary School	27	6	**33**
02 Sep 16	Grootberg Primary School	43	3	**46**
02 Sep 16	Rudolf Ngondo Primary School	117	10	**127**
12 Sep 16	Helena Primary School	57	7	**64**
23 Sep 16	Sikanduko Primary School	38	5	**43**
24 Sep 16	Waldfriedan Primary School	41	4	**45**
21 Oct 16	Peri-Naua Pre-Primary	15	2	**17**
22 Oct 16	Ondundu Primary School	23	3	**26**
11 Nov 16	Kalkfeld Primary School	21	4	**25**
18 Nov 16	Shining Star Pre-Primary School	30	3	**33**
	Total Day Visit:	**1,090**	**151**	**1,241**
	Total Namibian School Groups:	**1,233**	**178**	**1,411**

3. Higher Education and In-Service Training

CCF is committed to empowering Namibians to take over the conservation and protection of their wildlife. Toward this goal, for many years CCF has fostered Namibian college students' interest in wildlife conservation. CCF offers in-service training programmes for students from the Namibia University of Science and Technology (NUST – formerly Polytechnic of Namibia) and UNAM. The students conduct research projects, with the goal of completing a research paper at the conclusion of their internships. Several former interns have gone on to work at conservation organisations or with the Ministry of the Environment.

During this period, CCF continued to foster seven UNAM and NUST student interns who carried over from 2015, and an additional 30 interns as follows:

Table 32. Namibia higher education student interns.

Name	Inst	Field of Study	Term
Genetics	UNAM	Martha Alpheus	6 weeks
Genetics	UNAM	Helena Moses	6 weeks
Agriculture	NUST	Junias Ndiiluka	3.5 months
Nature Conservation	NUST	Evelina Inamutira	5 months
Nature Conservation	NUST	Petrina Iyambo	5 months
Animal Science	UNAM	Riita Haihambo	6 weeks
Environmental Biology	UNAM	Ester Kayala	9 months
Microbiology	UNAM	Florence Mukelabai Muyoba	3 months
Microbiology	UNAM	Margaretha Nangula	3 months
Animal Health	UNAM	Linus Mushabati	1 month
Animal Health	UNAM	Sinvula Ndana	3 months
Wildlife Management & Ecotourism	UNAM	Image Matengu	5 weeks
Wildlife Management & Ecotourism	UNAM	Esther Nghipunya	5 weeks
Genetics	UNAM	Anisa Maponga	3 months
Genetics	UNAM	Nali Ndjene	3 months
Genetics	UNAM	Julia Kagogo	4 months
Genetics	UNAM	Martha Hatutale	3 months

Agriculture	UNAM	Johannes Pius	4 months
Animal Science & Environment	UNAM	Nemone Williams	5 weeks
Animal Science & Environment	UNAM	Katuna Japora	5 weeks
Animal Science & Environment	UNAM	Helvi Kakololo	5 weeks
Animal Science & Environment	UNAM	Regina Ndumba	5 weeks
Animal Science & Environment	UNAM	Frieda Naambo	5 weeks
Tourism	UNAM	Himeezembi Kuhanga (Mike)	3 months
Tourism	UNAM	Matthew Kwooko	6 months
Tourism	UNAM	Susanna Ndapewa	5 months
Tourism	UNAM	Rauna Matheus	4 months
Tourism	UNAM	Albertina Elago	1 month
Food Science	UNAM	Elizabeth Elita	1 month
Food Science	UNAM	Lina Liniek	1 month

In addition to the in-service training students, CCF welcomes groups from Namibia's higher-education institutions to participate in programmes aimed at enriching their skills in various study areas. In 2016, CCF hosted three groups from UNAM and one from NUST. A total of 76 Namibian university students and three teachers participated in various aspects of CCF's work in the areas of Wildlife Management, Environmental Management, and Tourism (Table 33).

Table 33: Namibian higher-education groups visiting CCF from January to July 2016

Namibian Overnight Higher Education Groups

Date In	Date Out	School	Learners	Adults	Total
11 Mar 16	13 Mar 16	UNAM	2	0	2
9 Dec 16	13 Dec 16	NUST	3	0	3
		Total Overnight School Groups:	**5**	**0**	**5**

Namibian Day Visit Higher Education Groups

Date	School	Learners	Adults	Total
12 Apr 16	UNAM	12	1	**13**
25 Jun 16	UNAM	57	2	**59**
	Total Day Visits:	**69**	**3**	**72**
	Total Namibian School Groups:	**76**	**3**	**79**

University of Namibia - Faculty Workshop

In early June, Donna Rainboth, an Education Professor on sabbatical from Eastern Oregon University (USA), and CCF's Education Manager Stephanie Bradley planned and implemented a 4.5-hour workshop at the UNAM Khomasdal Campus in Windhoek. Twenty-five faculty members and five students attended the optional workshop and engaged in lessons from the revised teacher resource guide, "Cheetahs: A Predators Role in the Ecosystem." The lessons were used to showcase the guide, provide examples of research conducted at CCF and model best teaching practices.

Participants in the workshop explored the concept of adaptations and metaphors using the lesson "Cheetahs, Built for Speed". They looked at camera trap photos and identified wildlife seen on camera traps located throughout Southern Africa from "Camera Traps" lesson, and identified photos

of hair samples found in scat to determine what cheetahs were eating from the “Whose Hair Is It?” lesson. Math, language arts, and visual arts topics were embedded in the science lessons. Engagement in the lessons was followed by in depth discussions of the teaching methods modelled, the pros and cons of student-centred teaching as compared to teacher-centred, materials required for the lessons, alignment to the Namibian national syllabus and addressing the language barriers of 4th – 7th grade learners in Namibian classrooms.

B. Future Farmers of Africa

1. Community consultative meetings

During this reporting period, CCF conducted 13 consultative meetings across the four communal conservancies in relation to the Go Green Carnivore Landscape Project and Human-Carnivore Conflict issues (Figure 55). The meetings were attended by:

- CCF Staff
- MET representatives
- Traditional authorities
- Conservancy committee members
- Conservancy managers
- Game guards
- Resettlement and Affirmative action farms chairman

The CCF staff presented the carnivore landscape project to the attendees and talked about the human-wildlife conflict mapping element and integrated livestock and wildlife training workshops. The project was well received by all. Requests were made of the CCF staff such as training on livestock management and health checks, as well as husbandry. A special request for assistance with identification of poisonous plants was also received, since cattle grazing these plants is an issue in parts of Okamatapati.

As a result of the first four consultative meetings, the communities requested regional meetings to look in detail at human-wildlife conflict happening in their area, which the project had already predicted would be the case. The additional consultative meetings (Figure 52) would also enable the capture of detailed human-wildlife conflict information, such as the issue of large packs of African wild dog moving over large areas of the Otjituuo conservancy brought up by some participants at the consultative workshops. One of the conflict hot spots appears to be within a 10-30 km radius around Ongongoro, where eight calves were killed in January 2016 in the village of Otjitaazu.

Figure 52: CCF ecology team and MET staff conducting human-wildife conflict consulation meetings acorss the four communal conservancies, GWL.

MET officials in attendance at the consultative meetings assisted with matters of compensation policy and government involvement in the project. At each meeting, farmers reported that their biggest current issue is with wild dogs. Most farmers said that if African wild dogs and jackals were sorted out they would not mind dealing with other carnivore losses as they were not as common and isolated by comparison. Heavy losses of calves to African wild dogs were reported between December and March, associated with the height of the calving season. This suggests that the wild dogs are gearing their movements not only to safe denning areas or areas with water but also to areas where the calf density is high.

Huge losses were reported during the consultative meetings, particularly at Elandspan, Otjitaazu and Einde. Farmers from the latter two locations reported that they had hunted down and killed 11 African wild dogs (including pups), in retaliation for the loss of 20+ calves over the course of a month. Another farmer from the same area reported the killing of a cheetah also in retaliation for loss of livestock (although he was not sure which specific carnivore had killed his goats). Jackals were also reported as a major problem and the source of frustration on a weekly basis, particularly with attacks on goats, sheep and poultry.

2. Community training workshops

To date 176 questionnaires on human-wildlife conflict have been collected across the four communal conservancies. Information has also been collected on conflict cases reported through MET. This combination of information will allow us to focus the Go Green landscape project camera trap survey on hot-spot conflict areas (see section E. Large Carnivore Research and Ecology). The questionnaire data from 176 participants has now been analysed and the output information is being used to focus the topics being taught in the 12 human-carnivore conflict training workshops conducted in October and November 2016.

Tables 34-35 and Figures 53-55 show the preliminary results from the questionnaires (n = 176).

Table 34: Sex ratio split per age group.

	0-20	21-30	31-40	41-50	51-60	60+
Male %	1.7	4.5	19.9	17.6	11.9	7.4
Female %	0.0	4.5	10.2	16.5	2.3	3.4

Table 35: Breakdown of homesteads

	How many people live in your household?	How many different households are in your settlement?
Total	**1981**	**4063**
Average	11.3	23.1
Standard Deviation	8.7	20.3

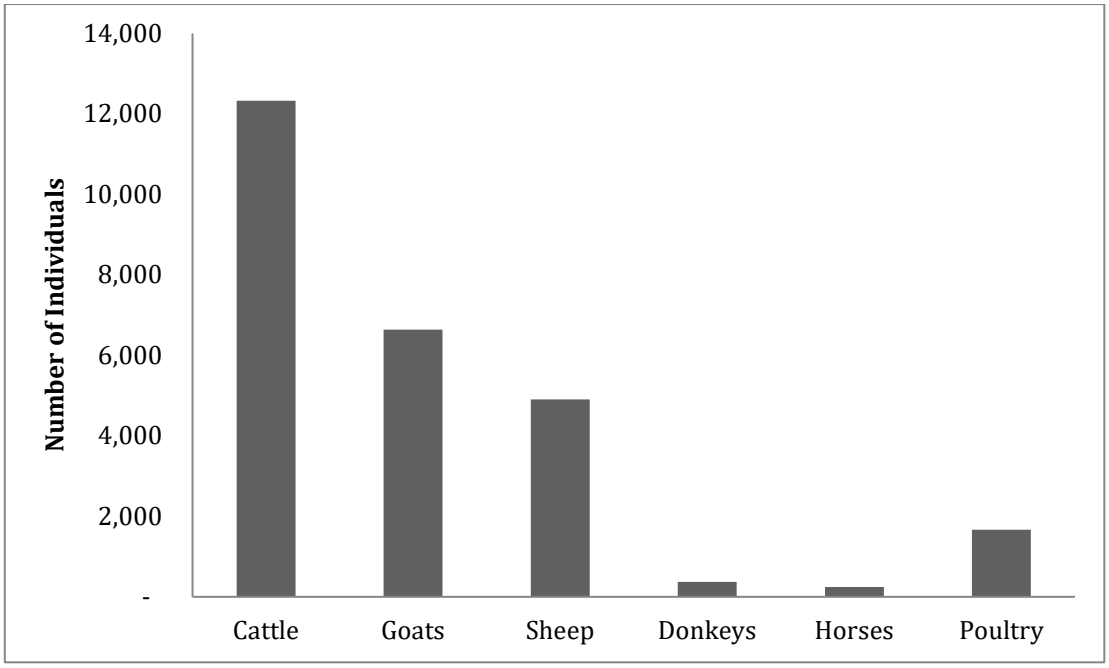

Figure 53: Total number of livestock owned (n = 176).

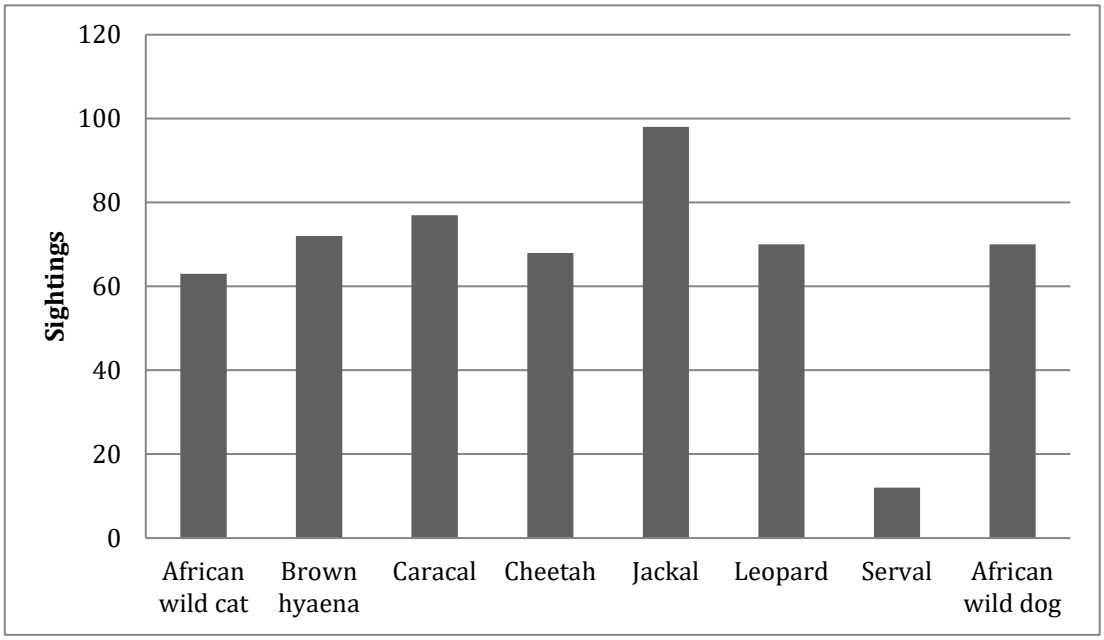

Figure 54: What is the most common wildlife you see in your village surroundings (1-day walk)?

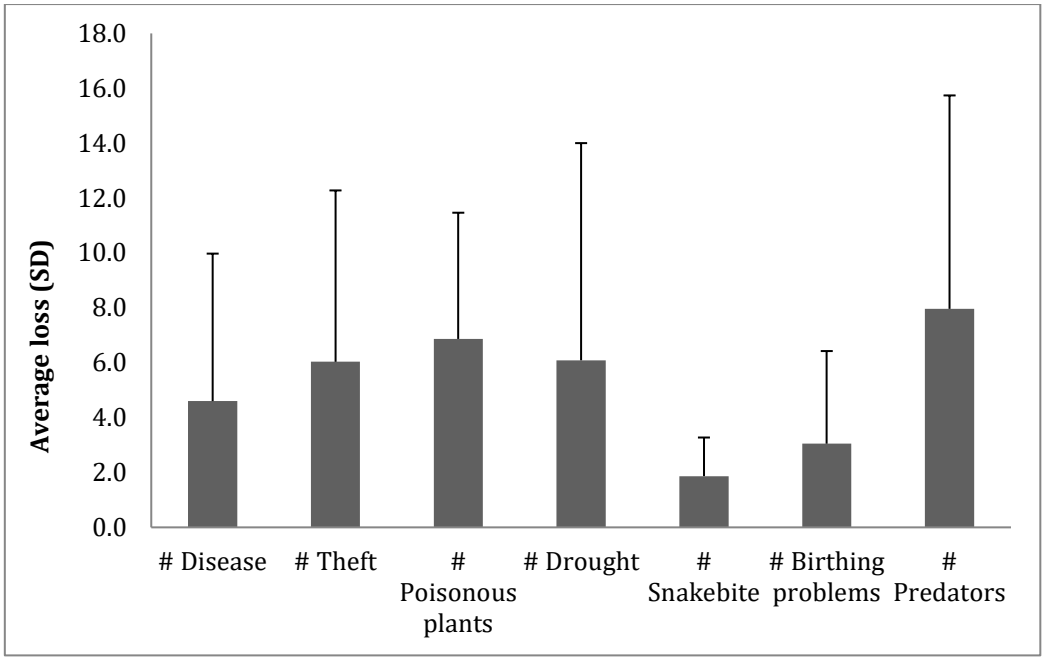

Figure 55: Have you experienced livestock loss in the last 12 months? The error bars represent upper and lower confidence limits around the mean (indicating the possible maximum and minimum estimate of population size).

Livestock loss in the communal areas takes many forms including loss from predators. It is therefore important to capture why livestock are lost for example from diseases such as ticks and parasites, theft and poisonous plants (Table 36). This then directs CCF integrated approach to workshop training modules as we cover all the topics to decrease from all aspects and not just from predation.

Table 36: What diseases have cause livestock death?

Disease	**%**
Anthrax	20.7
Botulism	0.5
Hypertension	32.9
Inflated Stomach	23.9
Ticks	15.0
Ombumba	1.4
Unknown	3.7
Worms	1.9

These results will now influence the topics taught during the upcoming training workshops so we use targeted information to maximise the impact of our workshop.

Completed training workshop dates:

Based on HWC data gathered since March 2016, workshops were conducted at 12 locations in October and November 2016 identified as key hot spot areas for conflict between a variety of carnivore species, including; wild dog, cheetah, leopard, caracal, jackal and brown hyena. Representatives from MET attended the workshops. A further 57 questionnaires were collected form the 12 training workshops and that data will be analysed all together with the other 176 questionnaires in 2017.

These training workshops are vital as the team has discovered persistent and intense human-carnivore conflict leading to the killing of carnivores particularly African wild dogs (Figure 56).

Figure 56: Dead African wild dog killed by local communal farmers in Okamatapati Conservancy as retribution of livestock predation.

Across the 12 workshops, CCF had 196 participants, with an average of 40 per conservancy (Table 38). In terms of gender, 89% of participants were males and 11% were females (Table 37). Through these workshops, CCF was able to reach for the first time a significant number of community members, as only 20% (*n* = 40) of participants had previously attended a CCF integrated training workshop; the remaining 80% (*n* = 156) had not been part of a CCF workshop.

Table 37: Shows the total number of participants at the 12 workshops, number of participants per conservancy and number of participants by gender (total/per conservancy).

Total number of participants	**196**
Participants per conservancy	
Otjituuo	85
Okamatapati	59
African Wild Dog	16
Ozonahi	36
Participants (Male/Female)	
Male	175
Female	21
Participants per conservancy (Males/Females)	
Otjituuo	
Male	77
Female	8
Okamatapati	
Male	54
Female	5
African Wild Dog	
Male	12
Female	4
Ozonahi	
Male	32
Female	4

The CCF team, comprised of Tarik Bodasing (Lead facilitator/Trainer), Richard Siririka (Translator) and Paige Seitz (Livestock Guarding Dog Program Manager), as well as two hired consultants, David Kaunotje (Lead facilitator/Trainer) and Jon Guebeb (Trainer), attended two of the workshops to present on the use of guarding dogs (Figures 57-59). A total of 56 questionnaires were completed, which brings the total HWC questionnaires to 232; these are in the process of being analysed.

Figure 57: Paige Seitz and David Kaunotje talking about guarding dogs at Elandspan.

Figure 58: More discussions about guarding dogs at Ongongoro.

Figure 59: Discussions about camera trapping to answer questions about predators.

Predator Kill I.D

A basic kill identification training exercise was conducted to educate farmers and farm workers on determining the cause of death of livestock. Model goats were used and attendees Kill ID skills were tested in different scenarios (Figure 60-62).

Figure 60: Attendees debating the cause of death for a specific “goat.”

Figure 61: Tarik Bodasing explaining Kill I.D to workshop attendees.

Figure 62: Trainer John Guebeb going through Kill ID options with attendees.

Grazing management

CCF’s newly-appointed facilitator David Kaunotje discussed the details of grazing management as pertaining to the health of livestock and the ecosystem. The key principles discussed were overgrazing, rotational grazing, lick supplementation and dietary requirements of livestock (Figure 63). This section also relates to livestock health and condition and, therefore, potential depredation by carnivores.

Figure 63: CCF facilitator David Kaunotje explaining grazing and grass nutritional value.

3. Farmer Training at CCF

The re-settlement and affirmative action farmers from around the Waterberg Plateau Park and members of the Eiseb Conservancy were brought to CCF on 8-9 October 2016 for a two-day human-wildlife conflict workshop. The workshop covered such topics as bush encroachment theory and practical, introduction to game counts and a practical of undertaking a game count, role of conservancies, human wildlife conflict discussion, role of predators and livestock predation identification (Kill ID) practical, introduction to tourism, and Livestock Guarding Dog Program discussion and practical (Figure 64).

Figure 64: Aspects of a 2-day human-wildlife conflict workshop.

C. Community Outreach

In line with CCF's mission, we take every opportunity to work with all stakeholders to develop best practices in research, education, and land use to benefit all species, including people. Consequently, CCF participates in trade shows to engage communities, learn more about their issues, e.g., human-wildlife conflict, and inform them of CCF's works in the areas of conflict mitigation and alternative livelihoods, as well as the tools at their disposal, such as our Farmers Help Line and the Carnivore Tracker App. This year, CCF participated in seven trade shows. Booths offering CCF's products were set up at five of these shows to promote CCF's alternative livelihoods programmes, having sold N$11,580 in creamery products and N$565 in handcrafts.

Outjo Game Festival, 29-30 April 2016

The CCF booth (Figure 65) was well attended, mostly by farmers, requesting information on CCF and interested in tasting and buying the food on offer from the Creamery.


Figure 65: Set up of the CCF booth at the Outjo Game Festival 2016.

Tourism Expo, 18-21 May 2016

CCF set up a booth at this year's Tourism Expo (Figure 66), where sales of Creamery products and crafts exceeded N$7,000. Numerous businesses enquired about stocking CCF's cheese and several requested price lists. Craft items, on the other hand, were sold to individuals, but there was little interest from lodges to make bulk purchases for their outlets. Dr Louisa Richmond-Coggan was able to speak to a great many lodges, tour operators, guides, etc. about the Carnivore Tracker App. with positive feedback and commitment to participate.

Figure 66: Set up of the booth at the Tourism Expo 2016.

Okahandja Ultimate Braai Competition, 28 May 2016

Both visitors to the booth and sales of products (nearly N$2,000) came in peaks and troughs as various activities and shows took place throughout the day. Dr Louisa Richmond-Coggan introduced herself to the local farmers, discussing conflict issues and giving out cards which advertised the Farmer Carnivore Help Hotline and Carnivore Tracker App.

Okakarara Agricultural Show, 8–9 September 2016

CCF's Ecology Research Assistant Richard Siririka attended the trade fare for the two days. To enable him to engage with community members, it was decided not to have a booth at this event. He spoke to farmers and completed 26 farmer information forms. Farmers were very interested in the LSGD programme and several application forms were completed. Most of the farmer feedback regarding carnivore issues at their villages was focused on jackals, although conflict with cheetah, leopard and brown hyena was also reported.

Otjiwarongo Agricultural Show, 17–19 September 2016

Richard Siririka worked alongside the CCF Tourism staff at the CCF booth, providing information on CCF's activities, research and education projects. The second day of the show was the busiest with 153 visitors requesting information and purchasing CCF products. Sales totalled approximately N$800.

Grootfontein Agricultural Show, 20–23 September 2016

The Grootfontein Agricultural Show ran daily from 8:30 am to 9 pm and got busier as it progressed. The second and third days were the main days for the various horse competitions and livestock shows, so while numbers were low, the people there were predominantly farmers and their families which provided an excellent opportunity to talk to them about conflict issues. It was determined

that this year CCF's would focus on distributing information rather than sales, to allow the staff to be more mobile and interact with the community. Dr Louisa Richmond-Coggan spent some time at the livestock show area each day, introducing herself to the local farmers, discussing conflict issues and giving out cards promoting the CCF's Farmer Carnivore Help Hotline and the Carnivore Tracker App., both of which she also promoted during a live interview on Channel 7 radio (Figure 67). The interview aired across Namibia and provided an opportunity to give some basic conflict mitigation advice.

Figure 67: Dr Louisa Richmond-Coggan being interviewed live on Channel 7.

Windhoek Show, 30 September-8 October 2016

Many farmers, both commercial and communal, showed interest in CCF's LSGD Programme during this show, and many complimented CCF's programmes in general. CCF's Creamery products attracted much attention and farmers were interested in the process and how they could start a dairy farm themselves.

Several farmers who have CCF's livestock guarding dogs on their farm shared their successes and told staff that their losses since having a dog had stopped completely. However, farmers still stated that they were having issues with a variety of carnivores on their farms from jackal to leopard and cheetah; hence, information and advice was given out to help reduce their losses. School children, students and teachers visited the stall as they all wanted to get involved with CCF in a variety of ways from outreach to internships. Local people who didn't know of CCF were enthusiastic about visiting the CCF Centre and learn more about our work.

D. Other Collaboration with Educational Institutions

During this period the CCF Centre hosted 12 international groups (212 students and 36 teachers/accompanying persons) from international schools and universities participating in educational programmes, including lectures on HWC, cheetah runs, and tours of CCF's Centre. Ten of these groups (169 students and 31 teachers) stayed at Camp Lightfoot, while two groups (43 students and 5 teachers) participated in day programmes (Table 38). Three of the groups are part of the USA Global Education Benchmark Group: Wakefield High School, Riverdale Country School, and Wilbraham & Monson Academy.

Table 38: International groups attending educational programmes at CCF January to June 2016

International Overnight School Groups					
Date In	**Date Out**	**School**	**Students**	**Adults**	**Total**
16 Jan 16	20 Jan 16	Tacoma School of the Arts (USA)	21	3	**24**
05 Mar 16	08 Mar 16	Wakefield (USA)	10	4	**14**

06 Mar 16	08 Mar 16	The Ross School (USA)	27	6	**33**
28 Mar 16	31 Mar 16	Riverdale Country School (USA)	9	3	**12**
17 Jun 16	19 Jun 16	Wilbraham & Monson Academy (USA)	10	2	**12**
13 Jun 16	16 Jul 16	National Geographic Student Exp. - USA	20	3	**23**
16 Jul 16	19 Jul 16	Earth Expeditions Group 1 (USA)	21	2	**23**
01 Aug 16	16 Aug 16	Earth Expeditions Group 2 (USA)	19	2	**21**
03 Oct 16	16 Oct	Traveling School (USA)	16	2	**18**
16 Oct 16	19 Oct 16	Dartmouth College (USA)	16	2	**18**
	Total International Overnight School Groups:		**169**	**31**	**200**

Day Visit International School Groups

Date	School	Students	Adults	Total
28 Mar 16	Worcester Polytechnic Institute (USA)	29	3	**32**
6 Jul 2016	International School of Luxembourg (Lux)	14	2	**16**
	Total International Day Visit School Groups:	**43**	**5**	**48**
	Total International Groups:	**212**	**36**	**248**

E. Volunteers and Interns

Volunteers are the backbone of CCF and vital in daily operations. During January to December 2016, CCF hosted a total of 98 volunteers and interns. Among these were 32 working guests/volunteers from the US, the UK, Italy, Belgium, Canada, Austria and the Netherlands. Eight of these were returning working guests/volunteers; another eight came with family members; one was a visiting vet; and five were CCF Board members from the US, Canada and Italy.

In addition to 30 Namibian student interns, CCF welcomed 36 international student interns from the USA, Canada, Zimbabwe, Brazil, Kenya, Tanzania and the UK. Their fields of study included veterinary medicine, genetics, zoology, ecology, fish and wildlife conservation biology, wildlife biology, animal science, public policy and governance, molecular biology, and forestry and natural resources.

VI. Structural Activities

A. Namibian Facility Developments

1. Existing Structural Projects and New Projects

2016 saw a tremendous amount of investment in the CCF Namibia infrastructure. More than usual progress was achieved as we had the services of Construction Manager Matt Renninger through July and Farms Manager Johan Britz loaned the use of a large front-end loader throughout the year. Improvements include:

- Security cameras were installed along the entry road to the CCF Centre and at Boskop and Janhelpman farms early in the year. At year-end, a local surveillance system was installed at the Centre and the Biomass Technology Demonstration Centre (BTDC).

- Phone systems were upgraded with a new PABX.

- A second internet access through a new ISP was achieved at year-end.

- Centre Borehole Analysis was performed. Six boreholes were cleaned and repaired. Vlei Dam infrastructure was upgraded with extra solar power and protection of the borehole.

- New LGD breeding pens were constructed with a grant from the Turkish government (TIKA).

- The Haas Clinic received a tile roof over the thatch.

- Farm staff housing at Boskop was upgraded including new washrooms.

- Dr Schmidt-Küntzel's house ("Anne house") was completed.

- Two new staff houses (North Staff Houses 11 & 12) were completed. These are both duplex adding four total living units.

- North staff laundry block was completed.

- North Staff Houses 9 and 10 were renovated. Changed to duplex structures (2 units x 2).

- Fencing was built around renovated/new houses 9, 10, 11, 12, Anne House and the Laundry Block.

- A berm has been added on North Staff housing side of entry road. Earthwork is ongoing to channel runoff water to new dam.

- A waterhole was dug in front of the new Meal house.

- A new battery bank was added in the Battery Room making Visitor Centre Battery room and LM House Battery room the 24-hour power for the Centre. Old dorm battery bank was taken to Boskop Farm and installed.

- Clinic building power was changed to battery power except for specific outlets in the clinic itself.

- North Staff Housing 1, 9, 10, 11, 12 and Anne House were serviced with generator and battery power. A new distribution kiosk was installed by Anne House.
- 2/3 of wire servicing the South Housing/Hotspot was replaced.
- Trench drain and water hose bib were installed at the clinic overnight pen.
- One of clinic's double septic tank system was full and a new one was built to replace it.
- Museum cracks and bat holes were filled.
- New Greenhouse (and pond) was installed, including electric and water servicing.
- Babson Guest House received repairs including painting, staining, re-grouting, and roof sealing.
- New Guest House Complex:
    - Meal house structural work was 95% completed and plastering was underway at year-end.
    - The 2 guest houses were nearly complete; needing only plumbing, electrical fixtures, awnings, and painting.
    - Major site work was well along, including septic and greywater tanks and a large berm at the Meal house.
- Biomass Technology Demonstration Centre (BTDC)
    - Two sheds, a canteen, generator building, and diesel storage area were constructed
    - A carbonising kiln arrived and was installed in one of the new sheds.
    - A new genset was installed and a major cable laid to feed power from the BTDC to the main campus (and to back feed battery power from campus to BTDC).
- Public safety rails were installed around several cheetah pens.
- Dormitory drainage was upgraded.
- Airstrip was graded and hangar cleaned.
- One of the Centre cheetah pens underwent major repair after a tree collapsed part of the fence.
- The visitor centre was furnished with tables made of recycled plastic and wood tables constructed by Estate Manager Paul Visser.

2. Automotives

Vehicles and tyre repair continue to be an expensive and time-consuming problem at CCF. During this period, CCF repurposed a new Safari Car. On-going maintenance on all working vehicles still takes place. Table 39 lists CCF's vehicles and their condition at the end of December 2016.

Table 39: CCF's vehicle fleet and each vehicle's status by the end of December 2016.

Vehicle	Status
Nissan4x4 (3307)	Running
Nissan4x4 (4349)	Running
Old Toyota4x4 (dogs)	Running
Toyota4x4(feeding)	Running
Quantum Old (2131)	Running
Quantum New (3878)	Running
Mahindra	Running
Old Land Rover, goats	Running
Old Land Rover, white	Broken
Green safari cruiser	Broken
GWM, game view	Running
Old land cruiser	Running
Condor	Running
Toyota 4x4 Farm	Running
New Nissan N5947OT	Running
New Nissan N4456OT	Running
New Nissan N7025OT	Running
New Nissan N7032OT	Running
Pajero Bruce N1198OT	Running
Toyota Laurie	Running
Big trekker	Running
Small trekker	Running
Gater	Broken
Camo bakkie	Running
Bynadaar trekker	Running
New Cruiser, Game view	Running
Camo Land Drover, Game view	Running
Ford bakkie, Game view	Running

B. Staffing

1. CCF Namibia Staff

As of 31 December, CCF Namibia employs 36 staff as follows. Additionally, CCF employs four cooks, 28 farmhands and domestic workers, and 24 Bushblok project workers.

- Laurie Marker, DPhil – Founder and CEO
- Emma Alfonso, DVM –Research Veterinarian
- Bart Balli – Research Technician & Cheetah Keeper
- Bruce Brewer, PhD - General Manager
- Tarik Bodasing - Ecologist
- Johan Britz – Farms Manager
- Tanya Britz - CCF Bush Accountant
- Ignatius Davids – Education and Tourism Officer
- Christoff Erasmus - CCF Genetics Laboratory Manager
- Karin Falk – CCF Accountant
- Ashley Flaig – Veterinary Nurse and Cheetah Keeper
- Josephine Gabriel – Tourism and Education Assistant
- Mike Gardiner – Tourism Manager

- Katrin Hils – Genetics Laboratory Manager (departed December)
- Job Iyambo – Tour Guide & Cook
- Becky Johnston – Studbook Keeper and Cheetah keeper
- Kristophine Keendjele – Giftshop Supervisor
- Himee Kuhango – Tour Guide & Tourism Assistant
- Nadja le Roux - Community Relations and Education Manager
- Matti Nghikembua – Forest Steward & Chief Ecologist
- Gebhardt Nikanor – Education and Tourism Officer
- Louisa Richmond-Coggan, PhD – Ecology Manager
- Teresia Robitschko – Personal Assistant to the Director
- Tamara Schenekar, PhD – Visiting Scientist a
- Anne Schmidt-Küntzel, DVM, PhD - Research Geneticist & Asst. Director for Animal Health and Research
- Paige Seitz – Livestock Guarding Dog Manager
- Tryves Shivolo – Tour Guide
- Miriam Shuudi – Tourism Assistant
- Bessie Simon – Assistant Farm Manager
- Max Simon – Mechanic
- Richard Siririka – Ecology Assistant
- Heike Stackmann - Volunteer Co-ordinator and Public Relations Officer
- Jo Taylor – Asst. Operations Manager
- Tyapa Toivo – Small Stock Supervisor
- Hanlie Visser – Hospitality Manager
- Paul Visser – Estate Manager

2. CCF USA Staff

- Brian Badger – Director of Conservation and Outreach
- Beth Fellenstein - Director of Operations and Finance
- Susan Kaufmann - Constituent Relationship Manager
- Paula Martin – Executive and Development Assistant
- Angelina Mertens – Donor Relations Associate
- Reid Nelson – Donor Relations Coordinator
- Heather Ravenscroft - Chapter Coordinator

VII. Organisational Activities

A. Namibia

1. Board Governance

CCF Namibia, a section 21 registered not-for-profit, held two board meetings in 2016. CCF underwent its annual financial audit on April 2016 by the Namibian auditing firm of Grant Thornton and Neuhaus.

2. Fundraising

Annual Gala Dinner

For the 18th consecutive year, CCF celebrated the speed and elegance of the cheetah with fellow Namibians at its annual Gala Dinner at the Windhoek Country Club on the 15 July. Mike Hill, CCF's Chairman of the Board of Trustees, was the evening's Master of Ceremonies. Because of the kind and generous people who support the species, this year's Gala was the most successful in the long history of the organisation.

The evening's featured speaker was Dr Peggy Oti-Boateng, Senior Programme Specialist for Science and Technology and Coordinator for the African Network of Scientific and Technological Institutions (ANSTI) in the UNESCO Multi-Sectoral Regional Office in Harare, Zimbabwe. Dr Oti-Boateng has over 32 years' experience in teaching, research and development of technologies for sustainable development and in science and technology policy-making. Oti-Boateng's talk highlighted the problems of lacking science in education in southern Africa and the need to encourage young women in science and technology.

CCF's International Patron, the Honourable Prof. Peter Katjivivi, Parliament President of the Namibian National Assembly, spoke on the new Namibian Conservation Parliamentary Caucus (NACOPAC). NACOPAC is a multiparty collaboration of parliamentarians committed to strengthening conservation governance and sustainable economic development in Namibia and the southern Africa region.

Dr Marker presented four 2016 Cheetah Conservation Awards, of behalf of the CCF Board of Directors, recognising those who have helped conserve the cheetah and the Namibian environment. Highlights of the awards programme included:

- Dr Chris Brown, an ecologist and environmental scientist with a long career in Namibia's environmental ambits, was presented with CCF's 2016 Cheetah Conservationist of the Year for his dedication to the Namibian environment and community conservation.
- The 2016 Cheetah Conservation Farmer of the Year was presented to Namibia's former Deputy Prime Minister, Dr Libertine Amathila, for her care and dedication to her livestock guarding dog.
- The 2016 Cheetah Conservation Educator of the Year Award was presented to Dr Willem J. Jankowitz, retired Director of the School of Natural Resources of the Namibian University of Science and Technology (NUST). CCF has worked closely with Dr Jankowitz and the school of Natural Resources training over 150 student interns in the past 17 years.
- Cheetah Conservation Fund's 2016 Special Loyalty Award was presented to Mr. Manfred Böttger for his years of support given to CCF. He has attended CCF's gala dinner annually for the past 18

years. Mr. Böttger is the owner and manager of the Swaco Group of Companies, a 100% Namibian owned and managed holding company dealing in commodities since 1933.

The annual CCF Gala is a much-anticipated celebration in Namibian conservation circles, for its festive atmosphere and because it recognises those who have played important roles in helping ensure the survival of the species. The dinner brought together more than 280 guests from business, conservation, agriculture and government sectors in Namibia, and CCF supporters from other nations, both on the continent and beyond. The silent auction once again was a huge success, with more than 120 items donated by local and international businesses, including artwork, jewellery, Namibian craftwork and tourism 'get-aways' at exclusive Namibian and international tourist venues, including stays at the NamibRand Reserve, and the Swakopmund Hotel.

Grants

Significant local grantors during this period include the European Union, the Turkish aid agency TIKA, First National Bank Foundation and the Pupkewitz Foundation.

B. CCF USA

1. Governance

During this period, the USA Board of Directors and Trustees had four meetings. Teleconference meetings were held on 26 February, 17 June and 16 December. Three members were elected to the Board of Directors: Rosemary Baker, Helen Chaikovsky and Marisa Katnic. Helen Chaikovsky was elected to Treasurer at the June board meeting. Four members were elected to the Board of Trustees in June: Roswitha Smale, Ann Passer, Mark Segal and Andreas Freund.

CCF underwent its annual audit in March with the field portion conducted on site in the Alexandria, Virginia offices on 17 to 18 March 2015. The audit was conducted by Michaud, Accavallo, Woodbridge & Cusano, LLC (MAWC). CCF was presented with a clean audit.

2. Operations

CCF continues to enjoy our current office space that allows room for collaborative work and space for interns to work. Two interns were selected to work in the office this summer. They worked primarily on setting up the online auction and soliciting donations for the online auction and other silent auctions held during Dr Marker's Tour.

For 2016, CCF continued using software from Bidding4Good to manage online ticket sales, silent auctions, and online auctions. This year the Portland and DC Chapters utilised Gesture, a mobile bidding system at their auction. Other remote credit card transactions at events continue to be processed using Square card readers. In September, we experienced significant challenges with our database, Bernard, including the inability to set up ticket pages for Fall Tour events. To address this issue, we used Eventbrite for some of our ticket sales during the fall tour. Because of the issues with Bernard, in November, we began investigating new database solutions to be implemented in 2017. A contract was signed with Blackbaud on the last day of 2016.

The staff is looking forward to providing direction and administrative support for volunteers of the newly-established Strategic Development Committee to grow our major donor base.

3. Fundraising

The CCF's Annual Fund Campaign includes four direct mail appeals: the Spring Appeal, the Chewbaaka Memorial Challenge, the Fall Appeal, and the Year-End Challenge. Each direct mail appeal includes several mailing components to targeted audiences during the time of the appeal and supported with e-mail solicitations. In addition to these major campaigns, several smaller, independent e-blast efforts are incorporated throughout the year, as well as two printed newsletters, two electronic newsletters, and two electronic 'Notes from the Field'.

Tours and Events

Dr Laurie Marker's US Tours

Dr Marker's North American 2016 Spring Tour was five and a- half weeks in duration as she travelled to 16 states and 26 cities to raise funds under the theme, *25 Years of Cheetah Conservation*, and re-introduce her first popular book, *A Future for Cheetahs*, featuring exclusive and exceptional photographs by Suzi Eszterhas. Dr Marker's North American 2016 Fall Tour ran from 5 October to 13 November, and comprised 11 states and 23 cities.

Below is a summary of Dr Marker's USA Tours with highlights on fundraisers, lectures, conferences, zoo visits, and special events supported by the CCF USA Chapters:

Fund Raisers for Spring and Fall 2016

- The 5th Annual Meetah Cheetah event in Sherman Oaks, California, was hosted by CCF USA Trustees Alan Feldstein and Elizabeth Marquart at the home of Rory Posin, with ambassador cheetah Tango from Cat Haven. The event was two-tiered with regular tickets at US$125 and family photo-op tickets at US$50, and was attended by over 120 guests.

- The Algonquin Club of Boston, Massachusetts, was the location for a special fundraiser dinner supported by CCF USA Trustees Paola Bari and Club member Tyler Moulton on 12 April. Carolyn Farquhar, representing CCF Canada, was in attendance. Tickets for the dinner, which was generously supported by The New England Zoo, sold for US$125.

- Concierge Unlimited, supported by owner and CCF USA Trustee Olga Pierce in Chicago, Illinois, hosted an evening with Dr Marker at the Langham Hotel with new cheetah friends and donors.

- A special cheetah fund raiser at Big Horn, California, was hosted by Alice Rosenblatt and CCF friend Jordan Sacks from Jordan Art Couture, with the presence of ambassador cheetah Johari and companion dog Yeti from the San Diego Zoo Park. The tickets sold for US$250.

- *All Things Cheetah*, the first major event in Denver, Colorado, was hosted by Carol and Bryce McTavish and Laura and John Nachbur. CCF USA Event Coordinator Dionne Stein and Denver volunteers helped to create this successful event.

- The Reid Park Zoo in Tucson, Arizona, held a fundraiser for CCF co-hosted by Cheetah Kids and CCF USA Trustee John Carver on 7 April, with a sold-out crowd. The event included a silent auction, a book signing and Namibia craft sales.

- CCF supporters Henri, Susan and Miller Bianucci hosted an evening fundraiser and lecture at the private girls' school Ashley Hall School in Charleston, South Carolina. Dr Marker's talk titled, *25 Years of Cheetah Conservation,* was attended by 75 guests.

- Busch Gardens, represented by COO Jeff Andrews, hosted a Night Safari with Dr Marker and cheetah friends on 28 April in Tampa, Florida. Tickets sold for US$100.

- The Explores Club Chapter of Atlanta and the Atlanta Zoo (Georgia) co-hosted Dr Marker on 30 April for a sold-out cocktail party with animal encounters, dinner and a lecture by Dr Marker titled *25 Years of Cheetah Conservation.* CCF sold Namibian crafts and books to generate support.

- On 1 May, CCF supporters Nancy Meyers and Chris Benbow hosted Dr Marker in Staten Island, New York, for a private fundraser. This was mainly a cultivation event to introduce cheetah conservation and Dr Marker to new prospective donors.

- Dr Marker's last Spring Tour event, *Rescue You Rescue Me* was a major benefit in Westport, Connecticut, to raise funds for two local animal shelters in Connecticut and CCF. The event, held on 3 May, was supported by CCF USA Trustee Richard Wiese, honorary guest Jim Fowler, and the surprise visit from the LEO Zoological Conservation Center with Director Marcella Leone and ambassador cheetah Adaeze.

- Dr Marker's first major cheetah fundraiser for the fall was held in St Helena, California, at the La Herradura Vineyards with the support of CCF supporter Anne Pentland and the CCF NO CA Chapter. It was a ticketed event with ambassador cheetah Themba and over 80 guests in attendance.

- In conjunction with the CCF USA Annual Board Meeting held in Sausalito, California, in October, CCF USA hosted a special Sunset Cruise aboard the Empress yacht at the Clipper Yacht Harbour for about 40 guests including members of the Board, Trustees and staff, as well as cheetah friends.

- The Lowell Thomas Award Dinner hosted by the Explorers Club was held this year in Santa Barbara, California. Dr Marker and Dr Bruce Brewer had the opportunity to attend the gala reception and awards dinner with fellow Explorers from around the world. CCF also hosted a booth at the gala silent auction and showcased its Livestock Guarding Dog programme with an Anatolian shepherd dog named Maggie.

- The Big Cat. Big Party in Portland, Oregon, was held at Wieden + Kennedy offices with the support of the CCF Oregon Chapter and the Wildlife Safari ambassador cheetah. The event, attended by over 100 guests, included live Paddle races and a silent auction. Tickets sold for US$150.

- Safari West in Santa Rosa, California, hosted its annual silent auction and dinner on 11 October with Dr Marker and an ambassador cheetah.

- Moorpark College's Rendezvous (California) at the Zoo fundraiser was held on 14 October with Dr Marker as the honouree and recipient of the Platinum Paw award for her lifetime work in cheetah conservation. The event offered VIP photo ops and a silent auction.

- The DC Gala in Washington was held at the law offices of Foley & Lardner, LLP on 20 October, hosted by the CCF DC Chapter on its 15th anniversary year. The evening commenced with a VIP private cheetah photo op followed by a presentation by Dr Marker with a cheetah ambassador from the Columbus Zoo. VIP tickets sold for US$250 and regular tickets for US$125.

- A Meetah Cheetah fundraiser hosted by CCF USA Trustee Suzi Rapp and the Columbus Zoo Promotions Dept. was held at the Zoo's new African Center in Columbus, Ohio. Tickets sold for US$75 and included a VIP Meetah Cheetah hour, plus a buffet dinner, cash bar and cheetah run. The event was sold out with over 225 guests.

- CCF USA Trustee Vicki Gourley hosted the annual Meetah Cheetah event in Oklahoma City, Oklahoma, on 29 October at the Cheetah Penthouse in downtown OKC. The Columbus Zoo ambassador cheetah was the highlight of the evening with cocktails, a buffet dinner and both live and silent auctions. Patron tickets sold for US$250 and regular tickets sold at US$150.

- CCF USA Trustee, Paul Zemitzsch co-hosted a cheetah fundraiser with Kathleen and Jim Snowden at the Log Cabin Club in Ladue, Missouri, for cheetah supporters in the St Louis area.

- Extraordinary Journeys and Empowers Africa hosted a fundraiser for CCF at the residence of Marcia Gordon to a sold-out crowd interested in visiting CCF Namibia. Dr Marker highlighted CCF's tourism offerings, such as the Babson House and the new Ecolodge set to open in 2017. The event garnered over US$2,000 from the US$50 ticket sales and donations.

- The Little Rock Zoo co-hosted a donor reception and fundraiser at the home of Rick Fleetwood and Gary Davis during Dr Marker's two-day visit to the zoo. Over 100 guests had an opportunity to hear first-hand about the mission of CCF.

Lectures and Conferences for Spring and Fall 2016

- Dr Marker began her tour with a lecture at UC Davis, California, with the support of the Wildlife, Fish and Conservation Department headed by Dr Peter Klimley. The lecture was well attended by the veterinary school. Afterward, a Dutch dinner was held at Bistro 33 with Dr Marker and CCF friends.

- On 30 March, Dr Marker gave a talk to the Santa Clara Veterinary School (California), hosted by the School's Vet Director Marilyn Thelen.

- On 1 April, Dr Marker lectured at Stanford University (California). CCF former intern Catie Mong arranged the campus event with the university students and professors from the Veterinary Department.

- On 5 April, Colorado State University – Ft Collins hosted Dr Marker for a full day of meetings with the Fish, Wildlife and Conservation Biology (FWCB) School. During her visit, she gave a lecture titled, *25 Years of Cheetah Conservation, Research and Engagement* at the Johnson Hall, which was open to the public and fully attended.

- University of Massachusetts in Amherst invited Dr Marker to lecture for a special classroom discussion on Wildlife Reproduction hosted by Dr Carlos Gradil in the Veterinary and Animal Science School.

- University of Massachusetts also invited Dr Marker to a classroom lecture on Climate Change and African Wildlife/Cheetah Challengers" at the request of Dr Toni Morelli, Research Ecologist, Northeast Climate Science Center.

- The Roger Williams Park Zoo (RWPZ) hosted Dr Marker for a lecture and a special book signing on 13 April in Providence, Rhode Island. This was the first visit to the RWPZ, where she lectured to a sold-out assembly of cheetah fans.

- Dr Joseph Gaspard, Director of Science & Conservation at the Pittsburgh Zoo (Pennsylvania) held a lecture and book signing with Dr Marker on 16 April at the Education Center.

- Dr Marker was hosted on 19 April at the Living Desert in Palm Springs, California, with the additional support of CCF USA Trustee Marisa Katnic, for their Cheetah Enrichment and cheetah exhibit where Dr Marker lectured on 25 Years of Cheetah Conservation. A special book signing was held afterwards.

- WCN (Wildlife Conservation Network) hosted their first Wildlife Conservation Spring Expo in Redwood City, California, at the Canada College Theatre, where Dr Marker lectured on 25 Years of Cheetah Conservation. CCF also hosted a booth at the Expo to sell Namibian crafts and Dr Marker's book, *A Future for Cheetahs*.

- On 25 April, Senator Jeff Flake and Congressman Ed Royce hosted Dr Marker for a bi-cameral briefing on "Combating Threats to the Cheetah, Africa's Most Endangered Big Cat," at the Rayburn Office in in Washington, DC. The LEO Zoological Conservation Center's Director, Marcella Leone, attended the meeting with their ambassador cheetah Adaeze and dog Odie.

- The Jacksonville Zoo invited Dr Marker to speak at a CCF fundraiser held at the Hicks Auditorium of the Jacksonville Public Library on 27 April. The event helped to create awareness of the endangered cheetah.

- The CCF USA Annual Board meeting was held at the Cavallo Point in Sausalito, California, on 10 to 11 October 2016, hosted by CCF stakeholder, Gregor Freund, and attended by the majority of the Board and Trustees. A Meet & Greet Dinner was held at CCF USA Trustee Bob Page's home, where guests were treated to a menu created by his wife and culinary master, Sherry.

- The 2016 WCN Expo, a sold-out event, was held at the Mission Bay Conference Center (California), where Dr Marker lectured to cheetah supporters from the San Francisco area. CCF hosted a booth to sell Dr Marker's book and Namibian crafts.

- Smithsonian Associates hosted Dr Laurie Marker and Dr Suzan Murray, Chief Veterinarian at the National Zoo, for a special, sold-out lecture titled *Challenges in Cheetah Conservation* at the S. Dillion Ripley Center on 18 October in Washington, DC.

- Oklahoma City Zoo and Botanical Gardens (Oklahoma) hosted Dr Marker with a luncheon and lecture to students from the area as well as a guided tour of the zoo. The zoo kindly supported the lecture and visit by Dr Marker with a donation to CCF.

- University of Georgia at Athens, Georgia, hosted Dr Marker for a dinner and lecture at the College of Veterinary Medicine on 31 October. This was Dr Marker's first time at the university and her talk titled, "25 Years of Cheetah Conservation, Research, and Engagement" was well received by the students and faculty.

- Rotary Club of Little Rock (Arkansas) invited Dr Marker to speak on 8 November to 400 guests at the Clinton Presidential Center Grand Hall. This lecture was mostly for cultivation and cheetah awareness for the Club membership, which is the fifth largest Rotary in the USA.

- The law firm of Shumaker, Loop & Kendrick in Florida hosted Dr Marker for a cultivation event, with the support of fellow partner and new cheetah supporter Daniel DeLeo. This was a cultivation event arranged by CCF USA External Relations Manager Susan Yannetti, and had a large turnout.

Other US Tours

CCF's Director of Conservation and Outreach, Brian Badger, toured seven U.S. states with a stop in UK before heading back to Namibia during January-February. His tour focused on a central theme and lectures were presented under the title *The Diversity of Front-Line Conservation*. CCF staff focused efforts to market Brian's talks to zoos in order to bolster those relationships. Expenses for this tour were underwritten and offset by zoos. CCF was able to sell merchandise as well as collect donations at many of the locations.

CCF USA Chapter Support

- CCF SO CA Chapter set up a booth on 17 April in celebration of Earth Day for the seventh consecutive year at San Diego's Balboa Park EarthFair. This event represents every type of environmental organisation, governmental programme and commercial enterprise with goods services, and causes that address the environment and quality of life. CCF sold cheetah items and crafts from Namibia, memorabilia as well as collected donations. It was a positive experience to share the mission of CCF at this EarthFair yearly which draws over 60,000 participants.

- A "Sip N Paint" event was created for attendees to learn to paint a cheetah. This unique event, held in San Diego, California, on 28 April at Cool Creations, Pottery Studio & Café, not only taught participants to paint a cheetah while enjoying a glass of wine

- The CCF New York Chapter led by Trustee Paola Bari hosted multiple events during the first six months of the year, starting off in April with "Art Uncorked" in New Jersey that raised US$491. In May, a special event called "The Fast and the Furious" was held at the beautiful family home of Tom Cullen in Goshen, New York, with over 60 guests in attendance. The LEO Zoological Conservation Center's Director, Marcella Leone, gave a special lecture on the endangered cheetah, with ambassador cheetah Adaeze and companion dog Odie.

- The New York 2016 Walkway Marathon, with more than 7000 people in attendance and two supporting runners from the CCF New York Chapter. CCF participated through Crowdrise to raise funds for the endangered cheetah.

- The CCF NO CA Chapter, with the support of CCF USA staff member Angelina Mertens and volunteers, celebrated Earth Day for CCF on 17 April at the Westwind Barn in Los Altos Hills. CCF volunteers Raja Badhury, and Ken and Jacky Sheets helped to staff the CCF booth.

- Also in California, the Oakland Zoo hosted a CCF booth in support of Earth Day on 23 April. Another Earth Day presentation was later held at the Holy Cross School in Santa Cruz on 29 April which inspired many children with cheetah stories and information about CCF Namibia.

- The CCF NO CA Chapter supported Whole Earth Festival on 6-8 May 2016 at UC Davis with a booth and support from cheetah friends in the area.

- The CCF Cheetah and Champagne event, hosted by CCF supporter Susan Janin, took place in July with 70 guests. Photographer Suzi Eszterhas gave a presentation about her inspiring work, and was accompanied ambassador cheetah Themba. Guests bid high on silent auction items.

- CCF NO CA Chapter volunteers attended the Half Moon Bay Harvest Party in September. CCF partnered with Wildlife Associates to share cheetah stories.

- CCF NO CA Chapter volunteers supported Paloma Russ's Kids & Adult Cheetah party with ambassador Themba in San Geronimo Valley Community Center (California).

- The CCF New York Chapter volunteers hosted a talk at the Beardsley Zoo in July, and a second one for International Cheetah Day on 4 December. CCF USA Trustee Paola Bari arranged and attended the Fair Trade Market and the HV Art Market in Poughkeepsie, New York, to share the mission of CCF.

- On 1 October, CCF collaborated with The Living Desert in Palm Desert with the official launch party celebration for the *Year of the Cheetah.* CCF USA Director Marisa Katnic represented the SO CA Chapter to raise awareness of the plight of the cheetah. The SO CA Chapter also hosted International Cheetah Day with a special fundraising brunch at Jake's Restaurant.

C. International Affiliates

1. Aktionsgemeinschaft Artenschutz (AGA) e.V.

Fundraising

- On 12 and 13 May, Dr Laurie Marker and her assistant Teresia Robitschko visited Germany for fundraising dinners in Wasserburg and in Stuttgart, where Dr Marker gave a presentation about CCF and Namibian crafts were sold.

- On 3 April, AGA representative Birgit Braun was invited to give a presentation about cheetah conservation at the zoo in Stuttgart as part of their "wild week-end" programme. In July, she was invited to give another presentation at a dog training school focusing on CCF's Livestock Guarding Dog Programme as well as the scat detection dog programme. Furthermore, AGA conducted several information booths, e.g. at the 3-day NaturVision Filmfestival, presenting CCFs work together with information about AGA's other projects.

- In August, AGA successfully conducted a fundraising challenge to match a donation from the Konrad Mayer & Peter Scheufler Foundation.

- In October, AGA celebrated its 30th anniversary with an event where the work of CCF was presented to attending guests.

- Also in October, AGA met with 10-year-old Sara from Denmark, who collected 400 Euro for the protection of the cheetah.

- In December, AGA highlighted International Cheetah Day on our social media channels.

- On 10 October, Birgit Braun gave a presentation at the Wilhelma Zoo in Stuttgart about cheetahs and CCF. This was part of the "wild week-end" programme at the zoo. On 10 and 11 December, AGA presented CCF again at the Christmas market in the Wilhelma Zoo.

Media

- AGA had a 4-page article about cheetahs, CCF and the use of swing gates in the February 2016 issue of Geliebte Katze, a very popular animal magazine, as well as a related article on the AGA magazine. Additionally, a ½-page article about the livestock guarding dogs was published in the Tierwelt newspaper.

- The documentary series “Kielings wilde Welt,” featuring a segment filmed at CCF Namibia, aired on ARTE TV on 26 September and again on 10 and 15 October.

2. AMIFELINS

Governance

In early 2016, AMIFELINS Board member Claude-Isabelle Dunand presented her resignation, which was officially registered during this year’s AGM held on 8 October.

Education Outreach

Schools

AMIFELINS presentation series aim to inform, educate and, above all, motivate the younger generation to become interested in the future of cheetahs and other big cats, in the hope that they will join in the Race for Survival. During this period, about 70 people were reached with our big cat conservation message. These included children as well as husbandry students, whose training Centre, located in Ain, has expressed interest in having AMIFELINS return for presentations during their future training sessions.

AMIFELINS’ education outreach is expected to continue, and has formed a partnership between the School of Philanthropy and the schools in Paris, as big cat conservation is expected to be the chosen theme by pupils for their 3-month workshops.

Events

Festival of The Associations of Puteaux – 19 June.

Julie Wornan and Catherine Ebbs-Perrin had a booth for AMIFELINS and CCF, with two panels presenting information about Cheetah and Big Cat Conservation. In addition to creating awareness, members from the Town Council expressed interest in the partnership between the School of Philanthropy and the schools in Paris, and wish to develop a partnership with the schools of Puteaux.

So far, US$350 have been donated by Members of AMIFELINS to CCF, by renewing their sponsoring of orphaned cheetahs during the 2016 Chewbaaka Challenge Campaign. Additional renewal of sponsorships is expected before end August 2016. These donations are complementary to the sales of cakes made by pupils at the Intermediate School of Saint Alban Leysse. Sales for the year total 450€ which were remitted to CCF in June, to go on with the support of B2 by this school in Savoie.

Festival “Ciel et Nature” (Sky and Nature) - La Flèche (Sarthe), 26-27 November.

The first Festival “Ciel et Nature,” which was the third event in cooperation with Fous de Nature (Crazy about Nature), was a great success with nearly 1,200 visitors during the week-end and the participation of 12 associations, including IFAW, KALAWEIT, ANIMALSASIA, LPO Sarthe and ASPAS. The event presented AMIFELINS with an opportunity to increase contacts and develop synergies.

In addition to an AMIFELINS booth, the organisation gave a presentation titled, “The Cheetah: A Race for Survival.” The presentation, attended by 43 people, provided information on CCF’s programmes and was followed by a Q&A session.

Some of the Festival attendees had previously attended a lecture by Dr Marker held in February 2014, in La Flèche.

Web Site and Social Media

With the support of AMIFELINS founder, Julie Wornan, the organisation continued to improve its web site by adding information from the CCF web site translated into French. This helps to encourage donations, as well as cheetah and dog sponsorships. Topics translated during this period include information on International Cheetah Day, as well as the study on global decline of cheetahs published in December 2016.

Brigitte Petraz also continued to add documents, translations, videos and information to "Coin des Enseignants" - Teachers' Corner - and "guepard.info" – information about the Cheetah – a web site created by Brigitte for the general public, the younger generations, and anyone wishing to learn more about cheetahs and cheetah conservation.

These efforts have resulted in a growing number of new contacts, including students involved in Veterinary Science or in Zoology. Some of them have become members, friends or supporters of AMIFELINS, and sponsored CCF's resident cheetahs.

The AMIFELINS' website has had more than 6,300 visits per month, i.e., an increase of 55% compared with 2015. Geographically, visitors to the web site are distributed as follows: Europe - 74 %, Asia - 13 %, USA - 11 %, Africa - 1 %, and South America - 1 %.

AMIFELINS' Facebook page, managed by Board member Patrice Aubry, saw its number of "likes" grow from 520 in 2015, to 801 at the end of this period. Of these "likes", 598 are in France, with 56 in Paris.

3. Cheetah Conservation Fund Australia (CCFA)

CCFA is now registered with ACNC (Australian Charities and Not-for-Profit Commission) which is the final step in receiving tax deductible donations from corporate sponsors. The second half of 2016 was taken up by strengthening the CCFA Public Fund, with tax deductible status and ACNC membership, and closing the original Cheetah Conservation Fund Australia Incorporated Association, which was accomplished after many bureaucratic difficulties. The Committee was replaced with a Board of Directors, who are confident they can now proceed as a stronger organisation.

Fundraising

- During this period, CCFA entered into a partnership with ZoosSA, South Australia.

- Due to contacts with the National Zoo in Canberra, which were established through Dr Marker's Cheetah Keepers Workshop, the Zoo has made donations directly to Namibia.

- CCF has kindly allocated naming rates to an orphan female cub recently adopted in Otjiwarongo. CCFA looks forward to raising further funds through a naming campaign.

Dr Laurie Marker's Australia Tour – March 2016

Dr Laurie Marker's first tour to Australia took place from 2 to 12 March 2016. The tour was organised by the newly-established CCFA and included the following events and activities in five locations:

- Sydney: TV interview at “Switzer”, a presentation at the Faculty of Veterinary Science at the University of Sydney and the Scots College and a meet and greet dinner.
- Adelaide: Event and book signing at the Adelaide Zoo.
- Monarto: Lecture at the Monarto Zoo, where professionals from Australia and New Zealand came together during three days for the first ever Australian Cheetah Workshop.
- Melbourne: Lectures at the St Monica’s College, the LaTrobe University, the Melbourne University as well as the Werribee Zoo. Besides those talks, CCF Australia organised CCF cocktail events and meetings.
- Perth: Lectured at the Murdoch University and the University of Western Australia. The tour ended with a great Big Cat Big Party, where cheetah friends and supporters gathered to meet with Dr Marker and learn more about CCF’s activities.

Media

- Towards the end of the year, broad media coverage of the PNAS paper on the disappearance of cheetahs in the wild attracted much attention. CCFA member Jayson McDonald represented CCFA live on the Australian Broadcast News Chanel, advocating for the case of cheetah survival. CCFA received a number of donations after that broadcast.

4. Cheetah Conservation Fund Canada (CCF Canada)

Carolyn Farquhar, Chair of Cheetah Conservation Fund Canada, attended the annual CCF USA Board of Directors and Trustees meeting in California. In July, Carolyn volunteered for two weeks at CCF Namibia. In addition to expanding her knowledge of CCF’s work, it was also a chance to see first-hand the difference Canadians are making at CCF Namibia. During her stay, she also attended the 2016 CCF Namibia Gala in Windhoek, which provided a wonderful opportunity to meet many of CCF’s partners and supporters in Namibia.

Fundraising

In the first half of 2016, CCF Canada has collaborated on several events focusing on cheetahs and young people. They continue with school presentations, each with a young cheetah champion co-presenting to their fellow students. A number of young people who helped CCF Canada celebrate International Cheetah Day in December 2015 have continued their fundraising and outreach efforts into the current year. In the past six months, more than 15 young children have held birthday parties in honour of CCF Canada. Young children continue to select CCF Canada as the beneficiary of their birthday party celebrations, bringing the total this year to 19 young people who are “cheetah champions”.

During the summer months, both the Toronto Zoo (with more than eight cheetahs) and Parc Safari, a wildlife park in Hemmingford Quebec (also with eight cheetahs), each organised educational and demonstration events celebrating the cheetah. Both organisations have helped raise funds for CCF.

In the final month of the year, they focused on International Cheetah Day, and were pleased to have a handful of fundraising events, organised by supporters in schools and a university. End-of-year fundraising effort yielded good results, although they noted Dr Marker’s absence this year (a break with the past four years) dampened the flow of donations. Fortunately, Dr Marker is scheduled to return to Canada, this time in Ottawa - the capital, and arrangements are underway for a major public event and strategic meetings with Canadian government and industry officials.

CCF Canada received major donations this year, from regular donors, and significant support was provided by a Canadian mining company operating in Namibia, B2Gold. The company also works

with the Ecology team at CCF. Overall donations and small grants allowed the transfer C$80K to CCF Namibia, at year-end.

Web and Social Media

Efforts to build CCF Canada's social media reach are paying off, and focus on building a donor base in the coming year. During the second half of the year, the team focused on enhancing the organisation's web and social media capacities. Considerable work was done by board members to substantially upgrade the design and navigation of the site, www.cheetahconservationfund.ca, with more comprehensive and user-friendly information about CCF and CCF Canada's role.

CCF Canada's newsletter, "Cheetah Tracks," was launched in June, followed by a second issue in the fall, coinciding with the website launch on 31 October.

5. Cheetah Conservation Fund Italia (CCF Italia)

CCF Italy has been very busy this year with the organisation of the CCF Italia association, travelling to Namibia, and focusing on the main events of Dr Marker's Tour in Italy in May in Ancona, Verona-Bussolengo and Padua.

There are 35 members of the association, and efforts are underway to enlist more.

On 8-9 January 8, CCF Italia's founder Betty von Hoenning represented CCF at the 66th Meeting of the CITES Standing Committee, where resolutions relevant to illegal cheetah trade were adopted (see section IV.F.3. Illegal Wildlife Trade).

Fundraising

During the month of December, CCF Italia published its 2017 calender on social media. The calendars were prepared by our associate Francesca Zirafi from Sicily, who volunteers as art director. Up to the end of December, 140 calendars have been printed. CCF Italia also sent an e-mail to its members (with information on 2017 fees).

Events

- A fundraising Pizza Dinner hosted by Rossella Clai, Counsellor of CCF Italia in Albignasego (Padua), on the ocassion of her birthday, was held on 7 February.

- Primary School Introduction of the Cheetah, from February to June, with 26 children involved and four teachers (Primary School of Campiglia Cervo, BI, NW Italy). The meetings were held during regular school time, for two hours, in February and April, involving children and teachers. A Cheetah Run on 28 May, was held during the school trip to a famous park in the near town of Biella.

- On 20 March members of CCF Italy participated in the Sport and Wildlife day in their hometown of Albignasego (Padua) with a CCF Italy booth displaying CCF items and handing out information about CCF's activities. CCF Italy Member Rossella Clai has been elected Town Counsellor of her hometown but is still active with CCF Italia.

- On 20 August, Rossella set up an information desk during the event "Young festival" in Albignasego, Rossella. Items from CCF Namibia and t-shirts where offered for sale.

- CCF Italia's Vice President, Matilde Venturi, organised two photographic events called "The Travellers' Thursday," at the Public School in Desenzano (BS). The first event was held in May. Matilde talked about CCF for an audience of 100 people. The second event was held in September, and she showed her new videos of this year's trip to Namibia to 100 participants and many new supporters, including veterinarians, who eventually joined CCF Italia as members.

- On 7 August, Betty von Hoenning held a fundraiser at the organisation's address in Campiglia Cervo. CCF signs were on display whilesold CCF merchandise were offered for sale.

- December 21: A conference about Namibia and its Jewels: Cheetahs, was held at the Fondazione CRB, which is the foundation of CCF Italia's bank, Cassa di Risparmio di Biella, as part of the bank's corporate responsiblity programme.

CCF Italy has initiated plans for three or four events to be held between May and August 2017.

Dr Laurie Marker's Tour in Italy: 6-9 May 2016

- Ancona: Dr Marker held a lecture during the Annual Vet Association Assembly in the Mole Vanvitelliana, where we had also the opportunity to sell our items. CCF Italy had the assistance of Professor Giacomo Rossi, a pathologist and Professor at the University of Camerino who invited Dr Marker and conducted a study about cheetah gastritis due to helicobacter. The student Sara Mangiaterra of the same University went to CCF Namibia from December to February 2015 to collect data from CCF's cheetahs to compare to the captive cheetahs held in the Zoo Parco of Falconara, near Ancona. CCF Italy had also a meeting with the students at breakfast time and a dinner offered by the association. During the Ancona meeting, Members of CCF Italy Betty von Hoenning, Matilde Venturi and Duncan Campbell were present, along with Domenico Marrali from Sicily. On 7 May, we were invited to the Zoo Park Falconara where Dr Marker was followed by many fans coming from many parts of Italy. Members of CCF Italy had a walk inside the Park, where Laurie answered questions and made a radio/TV interview with a local station. A dinner with 60 people followed, which gave Dr Marker the opportunity to meet many new friends, included a video of CCF. The Zoo made a donation to CCF Italia and sold new sweaters (of CCF's 25th anniversary) and items from Namibia.

- Verona: A lecture inside the Parco Natura Viva in Bussolengo in the presence of Cesare Avesani Zaborra was held on 8 May 2016 during Mother's Day, followed by a drive through the Park to watch the four cheetahs in their big, new enclosures, with children and parents and fans of the Veneto area. An interview of Dr Marker was conducted and was broadcasted on national TV later in the same month, which gave a great visibility to CCF's activities. A donation was made by the audience, Dr Marker signed photographs and many registered as members of the Italian association. Betty and Matilde, Dr Marker and her assistant Tess were joined by Rossella Clai and Marina Mastropietro for the day, which concluded with a pizza dinner at the hotel, together with CCF's corporate sponsor Gepard, which joined us to present their production to Dr Marker.

- Padua: Dr Marker lectured at the University of Padova on 9 May with students and Professors who had previously visited Namibia and CCF for a study trip in 2015. The lecture was held in the Aula Magna of the Department of Comparative Biomedicine and Food, Legnaro, hosted by Professor Marco Patruno and Professor Barbara Demori.

Media

At the end of December, and resulting from the PNAS study on declining cheetah populations, which received ample media coverage in Italy, Betty gave an interview to Italy's national TV Canale 5 for

the program Noah's Ark. Canale 5 showed footage of CCF and Dr Marker. The interview is scheduled to air on 15 January 2017, and it is expected to generate great interest, along with donations and calendar orders.

6. Cheetah Conservation Fund UK (CCF UK)

One of the goals for 2016 was to increase awareness of CCF UK through media presence and increasing links with other NGOs in the conservation sector.

Governance

The CCF UK Board met in January 2016 to ratify financial statements and these were uploaded to the Charity Commission website. The Board reviewed skills required and invited two new members with corporate and major donor expertise to join the Board in the second half of the year.

Jane Galton, co-chair of CCF UK, visited Namibia in June and spent two days at CCF as well as attending the US Board Meeting in San Francisco in October.

Fundraising

Since May, the CCF UK Marketing Team have been working on CCF UK's fundraising event of the year: a dinner and book launch at the May Fair hotel in London, 14 November for the Big Cat Man, the autobiography of our patrons, Jonathan and Angie Scott of the BBC Big Cat Diaries. Laurie will also be attending this event.

Events

- Walk for Wildlife (April – September). Five wildlife charities (Save the Rhino, David Sheldrick Wildlife Trust, Tiger Conservation, Lion Aid and CCF UK) were chosen by the organisers to be part of this event.

- Hamerton Zoo Park held a Cheetah Day (August). The CCF UK team visited Paradise Wildlife Park and Marwell Zoo to discuss future events/collaboration.

- Big Cat Coffee campaign around Southampton.

- Jonathan and Angela Scott's fundraising dinner and book launch (November): This event held at the May Fair hotel in London was for the Big Cat Man book, the autobiography of our patrons, Jonathan and Angela Scott of the BBC Big Cat Diaries. Dr Marker was in attendance and with Jonathan gave well-received presentations. The event included cheetah-themed auction prizes, including an exclusive safari experience donated by Aardvark Safaris. Over 160 people attended including Princess Michael of Kent along with celebrities in the media and conservation worlds.

Dr Laurie Marker's UK Tour and NGO links – 9-11 May 2016

Dr Marker visited the UK for 2.5 days in May. Events included, i) dinner with AWF and an introduction to a possible investor in Bushblok; ii) reception for Dr Marker to meet the CCF UK Marketing team; iii) dinner at a high profile private members club organised by a member of the CCF UK team inviting high net worth individuals. The latter event was an experiment and was not successful in bringing in new donors largely because we had no capacity to follow up.

In addition, strategic meetings were conducted with the Born Free Foundation (BFF), United for Wildlife (a Duke of Cambridge initiative), Tusk Trust, Population Sustainability Network (PSN), Whitley Fund for Nature (WFN) and African Wildlife Foundation (AWF).

PR, Marketing and Media

The CCF UK marketing team of volunteers comprises a core of eight people with a floating group of another four. Skills include PR, marketing, social media, website and database management, events management, writing/editorial, institutional development, conservation and admin. This committed group met three times in 2016 and were instrumental in putting on the Scott event in November as well as supporting the development of the charity in 2016.

Media

With the support of Patricia Tricorache, CCF UK contacted the BBC with photos of the illegal trade in April and this resulted in an interview with Dr Laurie Marker during her May visit. A news piece about the illegal wildlife trade with a focus on cheetahs was aired twice during BBC News the day before the start of CoP17 on 23 September. This increased the profile of CCF in the UK and raised the awareness of the cheetah trade. Laurie was also interviewed by ITV during the CoP17 in Johannesburg.

The PNAS paper on the global decline in cheetahs resulted in over 15 articles in the UK press at the end of December, and an interview with Dr Laurie Marker by Sky TV, which had a positive impact on website hits, donations and people coming forward to volunteer in late 2016/ early 2017.

Social Media

- Facebook likes almost tripled from 315 in November 2015 to 830 by the end of 2016;

- Twitter followers increased from 52 and zero interactions at the beginning of this period, to 513 by year-end with a significant increase in interactions. We built links with notable profiles that share and re-tweet our CCF-UK information along with a shared Twitter campaign with United for Wildlife. The BBC news piece (see Media below) leading to CITES CoP17 was our most successful tweet of the year; we continued raising awareness about the plight of the cheetah during CoP17 and our followers grew significantly. Our second most popular tweet of the year was around ICD.

- The CCF UK website was updated to a Word Press platform to allow more interaction, and an online shop was added. Website activity increased from 297 hits in February 2016 to over 700/month with a peak of 1,073 in December.

- CCF UK Instagram account was opened in October.

- Salesforce contacts database was donated by the company as part of their charitable giving, saving us over £20,000. There are 4,748 contacts on the database.

Outreach Efforts

CCF UK became one of the official partners for British Veterinary Services (BVS), which provide recruitment services for vets and vet nurses. Jane Galton attended a BVS event outside of London in October to promote CCF, and Rebecca Argyle, Tony Cadman and David Leather, members of the CCF

UK Marketing Team, attended two days of the London Vet Show in November and promoted CCF on the BVS stand.

D. Public Relations, Marketing and Media

1. Social Media

Facebook

Currently, CCF staff manages three Facebook pages, one for CCF @ccfcheetah, one for Dr Laurie Marker @drlauriemarker and one to raise awareness about cheetah trafficking @CCFKeepCheetahsWild (see section IV.F.3). Staff also co-manages a page dedicated to CCF's stuffed purring cheetahs that is filled with fan photos and user content shared to the page. In 2016, Facebook launched a new system for users to respond in a more dynamic and nuanced way. The options to express like, love, haha, wow, sad, and angry were added. CCF staff monitors feedback on which types of posts receive positive and negative responses and adjusts content accordingly.

As of December 2016, CCF's Facebook page has ~250,900 followers, this is up from 194,000 in January of 2016

Chewbaaka's Cheetah Friends Facebook Fan Page

In June 2014, CCF launched a purring cheetah sales initiative called Chewbaaka's Cheetah Friends. This initiative was developed by CCF's Southern California chapter leadership and co-managed by CCF USA staff. Updates are posted to the page showing the CCF purring cheetah and his travels. This aims to promote the purchase of purring cheetahs for participation. Facebook users can like the fan page and share photos of their CCF purring cheetahs.

As of December 2016, Chewbaakaʹs Cheetah Friends has ~850 followers up from ~700 at the end of 2015.

CCF Staff has enlisted the assistance of interns to help take photos of purring cheetahs across the US. During 2016 the page had a guest cheetah known as Esperanza. Her travels around Central and South America were shared by a volunteer in San Diego, CA.

The post with the highest number of impressions for this period was a photo shared on 20 November from The Simpsons memorial in Springfield, Illinois. This post reached 8,125 people, and received 55 Likes, Comments & Shares with 110 post clicks.

Dr Laurie Marker Facebook Fan Page

Dr Laurie Marker's Facebook page is primarily photos of Dr Marker with visitors and focuses on sharing the work of CCF from Dr Marker's perspective.

As of December 2016, Dr Laurie Marker's Facebook page has ~3,500 followers, up from ~2,100 at the end of 2015.

The post with the highest number of impressions for this period was a shared link from Laurie's Huffington Post blog about the UAE's draft law to ban exotic pets on 19 August 2016. This post reached 74,880 people, and received 1,735 Reactions, Comments & Shares with 1,542 post clicks.

LinkedIn

LinkedIn is a social network focusing on professional development. CCF has two LinkedIn pages that are monitored by CCF staff: Dr Laurie Marker's personal LinkedIn account and the Cheetah Conservation Fund account.

Laurie Marker - LinkedIn

Dr Marker's personal LinkedIn account has limited analysis capabilities as it is a free account. Analytical tools require purchasing a monthly or yearly business or premium plan. As of 30 December 2016, Dr Marker has over 500 connections (members that are in her network).

Dr Marker is a member of 35 discussion groups. These discussion groups are useful in pursuing professional opportunities and enrichment. This year, CCF staff shared the year-end report to all relevant discussion groups that Dr Marker is a member of, and received 107 views on that post as compared to one view last year when the year-end report was posted and not shared to groups specifically.

Cheetah Conservation Fund - LinkedIn

Cheetah Conservation Fund's LinkedIn account has Analytics enabled. CCF staff monitors the Analytics for this account. In general, academic papers, job postings and scientific announcements perform best on this platform.

As of 30 December 2016, CCF's LinkedIn page has ~1,100 followers, up from ~900 in January of 2016.

Twitter

CCFCheetah is CCF's Twitter feed. CCF Twitter is volunteer managed with guidance from CCF staff. All content on CCF's Twitter is original to the platform as of this reporting year. CCFCheetah currently has ~15k followers. CCF staff shares relevant content as re-tweets from select individuals and groups of the 883 organisations followed by CCFCheetah. On average during this reporting period, CCFCheetah received 1,100 link clicks averaging 12 link clicks per day, 805 re-tweets averaging 9 re-tweets per day, and ~224k impressions.

Instagram

Instagram is a social media site for photo/image sharing. Posted photos utilise hashtags to be collected into groups and searchable within the site. As of December 2016, CCF's Instagram has 12,000 followers. Photos on CCF's Instagram receive an average of ~800 likes per photo and videos receive an average ~1,300 likes per video. CCF's Instagram account has received a total of 729 comments across all its content. The most popular video on our Instagram page is a video of one of CCF's non-releasable cheetahs named Dexter. This post was viewed ~38,000 times and received ~7,300 engagements, which includes shares, comments, and likes. The most popular photo on CCF's Instagram is a photo of resident cheetah Amani. This post received ~3,100 engagements, which includes, comments, likes and shares.

Pinterest

Pinterest is a social media site where users can collect online content from anywhere on the internet and curate "walls" on which they display this content. Pinterest is used by teachers to collect lesson plans from each other, and by people interested in cooking, DIY (Do it yourself) and crafting. CCF

launched its Pinterest page in January 2016 and CCF staff have both created unique content for Pinterest and re-pinned cheetah content from other user boards. As of June 2016, CCF's Pinterest page has an average of 17 daily impressions and 8 daily viewers. CCF's Pinterest is divided into boards by subject. The Education Resources board received 208 impressions for the year and the I HeART Cheetahs board, focused on cheetah art, is the board most clicked through with 53 clicks.

DeviantArt.com

DeviantArt.com is the platform where artists can participate in groups with other like-minded artists. The artists can submit their work to boards and participate in discussions. CCF's DeviantArt page is volunteer managed. Each month there is a contest in which users can submit entries and earn currency as spots on their very own virtual cheetah. CCF's DeviantArt page has 13 members and ~1,900 page views.

Reddit

This year, CCF has become an active part of the online community known as Reddit. Reddit is a social community that has millions of followers who talk about thousands of different topics on a daily basis. By becoming a part of this community, CCF is able to reach new untapped social markets, at minimal to no cost. CCF has one Reddit account which is monitored by CCF staff.

This account is currently a part of the following online groups:

- /r/cheetahs
- /r/conservation

There is no analytical system provided on Reddit, however, CCF Staff can look at the Google Analytics to see the results. Since actively sharing to Reddit starting in September of 2016, the CCF website has received 1,698 page views from Reddit links.

When a study about cheetah population decline was circulated on the internet and carried by major media, it was shared to Reddit via the /r/science board. "*Cheetahs heading towards extinction as population crashes - The sleek, speedy cheetah is rapidly heading towards extinction according to a new study into declining numbers. The report estimates that there are just 7,100 of the world's fastest mammals now left in the wild. - Animal Science*," was featured on the front page of Reddit and from 26 to 28 December cheetah.org had 770 total visitors from social media with Reddit bringing in 394 of those visitors.

CCF Blogs

Huffington Post Blog

Dr Laurie Marker became a blogger on *The Huffington Post in 2012.* Huffington Post is considered one of the more influential Internet-based news sources, and content posted to Huffington Post often exposes CCF to new audiences. Unlike the CCF website blog, which is about CCF's programme news and staff/intern stories, the Huffington Post blog is intended to be a voice for Dr Marker herself and functions much in the same way as an op-ed page. Successful Huffington Post pieces should be timely with events of the day and have an appeal to general audiences who are not familiar with CCF.

As of the end of 2016 Dr Laurie Marker has posted eight Huffington Post blogs:

- The Birds and the Bees and Cheetahs: published on 15 February 2016
- Termites, Mushrooms, and Cheetahs: published on 17 May 2016
- Linking Environment and Development to Sustainable Land Management: published 24 June 2016
- The UAE Set to Ban Exotic Pets – A Win for Cheetahs?: published on 19 August 2016
- Celebrating World Habitat Day – Our Work to Revitalise Cheetah Habitat: published on 3 October 2016
- Illegal Wildlife Trade and CITES CoP17 – The Outcomes Regarding Cheetahs: published on 12 October 2016
- World Science Day – Peace in Namibia Helps Efforts to Save the Cheetah: published on 10 November 2016
- Celebrate International Cheetah Day with Us!: published on 2 December 2016

Cheetah.org Blog

The CCF blog is hosted on our website. Posts on the blog are sent out every other month to supporters as an e-newsletter entitled *Notes from the Field – CCF's electronic Newsletter* and are also shared to Facebook and Twitter. The purpose of the CCF blog is to present longer format stories from our facility in Namibia that allow us to share with our audience the recent happenings at CCF.

From January to December, CCF Staff and guest bloggers have made 36 posts on the blog, covering a variety of topics, including a new serial blog called Cheetahs, Camera Traps, and Communities that focuses on the ecology team in Namibia, two updates on released cheetahs Zinzi and Jacomina, volunteer and intern blogs, overviews from both Dr Marker's U.S. Tours and the orphan cheetah cub relocation.

2. Website

Google Analytics for cheetah.org

CCF staff monitors the general email inquiries received through its website. These inquiries are handled in a team fashion utilising relevant staff to address them. Inquiries are usually handled within 24 hours. During this period, approximately 323 direct web-based inquiries were handled. These are emails sent by donors and/or supporters and include school projects, hunting or cheetah-health related issues, visiting CCF or volunteering, media inquiries, and issues with donations, among others.

CCF staff utilises Google Analytics to monitor user engagement. Google Analytics is a feature that inserts code into select web pages to gather user information.

3. International Cheetah Day (ICD)

Zoo Outreach and Media

Every year on 4 December, CCF leads the efforts to celebrate International Cheetah Day, a day in which zoos, supporters and staff come together to promote primarily the cheetah and CCF's efforts toward saving the cheetah in the wild. However, steps have been taken to make this day an all-access conservation focused day that any organisation can easily help celebrate. CCF staff and volunteers created a Tweet Sheet to make it easy for supporters to click and tweet using the hashtags #SaveTheCheetah and #IntlCheetahDay. CCF staff tracked a total of 288 sessions using the Tweet Sheet URL internationalcheetahday.com/twitterstorm/ during this reporting period.

4. Media

Press Releases

CCF issued eight press releases between January and December 2016 (Table 40).

Table 40: Press Releases sent between January-December 2016.

Description	Distribution	Date	Coverage
Genetic Diversity in Wild Cheetahs	805	24 June, 2016	Media and Core
Press Scent	789	8 Sept. 2016	Media and Core
B2	77	3 Oct. 2016	Media and Core
CITES	775	4 Oct. 2016	Media and Core
ICD NA/SA	119	29 Nov. 2016	Media and Core
ICD World	688	1 Dec. 2016	Media and Core
ICD Post	116	5 Dec. 2016	Media and Core
Cheetah Decline	750	27 Dec. 2016	Media and Core

Media Monitoring

Major Media Story of 2016: Disappearing Spots

On 26 December 2016, a study co-authored by Dr Laurie Marker, Dr Anne-Schmidt-Küntzel and 52 other authors was published in the scientific journal, Proceedings of the National Academy of Sciences (PNAS). The study is titled, *Disappearing Spots: The Global Decline of the Cheetah and What It Means for Conservation*, and its publication generated headlines in news outlets around the world that focused the total number of adult cheetah projected to be remaining in the wild -- just 7100. While the International Union for the Conservation of Nature (IUCN) Red List published the same number in 2015, the release of this PNAS study had a tremendous impact in the mainstream press. Hundreds of international media outlets, including broadcast and cable television networks; national, regional and local newspapers; radio; Internet news sites and blogs, covered this important story.

With information supplied by an embargoed media release, the AP and the BBC broke the story simultaneously on the morning of the 26th. Their stories were followed closely by ones from Reuters, UPI and AFP. These wires services generated "mother stories" picked up by subscribers and

also helped other journalists write their own stories, with facts and quotes taken from the embargoed press release distributed by the Zoological Society of London, Panthera and the World Conservation Society, the lead organisations for this study. A Washington Post story by Sarah Kaplan was syndicated and received widespread pick-ups.

CCF began receiving requests for comment by Dr Marker on 24 December, and the interview requests continued rolling in over the course of the week that followed. On the day the story broke, Dr Marker gave interviews from CCF in Namibia to several international television broadcasters using Skype. The outlets included BBC World News and Sky News (UK), Deutsche Welle (Germany), and France 24 (France). On 27 December, Dr Marker gave an interview to Agence France Presse (AFP), the leading newswire service in Europe. The story containing her quotes was published in dozens of outlets across Europe, Africa, the Middle East and Asia. Also on 27 December, representatives of CCF Australia were interviewed for a report airing on ABC-TV, a 24-hour news channel.

CCF has compiled nearly 200 of these stories using free Internet search engines and the assistance of CCF affiliates in France, Canada, Italy, the UK and Australia, and the news continues to generate additional coverage.

Other Media Coverage

CCF staff monitors media primarily through Google's free News Alerts service, using specific query terms relevant to CCF's activity. Media reports are received through CCF's contacts, staff, and volunteers. During this period CCF was featured or mentioned in over 120 articles, blogs, interviews, etc.