# Cheetah Conservation Project Zimbabwe

## Progress Report
## 2023


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## Summary

As the year 2023 ends, we would like to extend our most profound appreciation to the Zimbabwe Parks and Wildlife Management Authority for their swift issuance of our research permit. Thanks to their efficiency, we could kickstart our fieldwork without any hindrances. Against all odds, this year has been remarkable for our project in several aspects! One of the highlights was Ria (cheetah HNP047) giving birth to a lone cub in June. In addition, Matilda the Cheetah (VF009) successfully raised all four cubs born in 2022, skilfully guiding them to adulthood. It's impressive how these female cheetahs outmanoeuvre other predators and ensure the safety of their cubs.

Furthermore, we enjoyed witnessing Elliott (Cheetah HNP103, son of HNP047) successfully dispersing and establishing a territory abundant with prey. In another unexpected turn, a cheetah presumed to be deceased (HNP038) from the past reappeared near Sinamatella. These exciting cheetah-related developments have been a cause for celebration throughout the year. Additionally, our project has expanded as we welcomed Malcolm Ngwenya, a research student from Midlands State University, who will be with us until he completes his work-related learning. We value his contribution and look forward to his insights. None of these achievements would have been possible without the incredible support of our citizen scientists, who continuously provide us with valuable information and photographs of cheetah sightings across various parks in Zimbabwe. Their dedication and assistance are vital to the success of our work. We would also like to express our immense gratitude to our generous sponsors, both corporate entities and individuals. Special recognition goes to The Rufford Foundation (UK) and Anne and Elliot Summers (US) for donating a satellite collar. Their support has been instrumental in facilitating our research effort. Our preliminary results show that the cheetah population may be lower than previously assumed, as indicated in our report on pages 11-12. These findings provide valuable insights for future conservation efforts. Unfortunately, the year ended on a sad note as Dr Sibanda experienced the loss of a beloved family member in November. We dedicate this report to the late Mr Prichard Sibanda, who tragically passed away on November 23rd after a prolonged battle with cardiac myopathy. Mr Prichard Sibanda played a significant role in Dr Sibanda's academic journey, and his memory will forever be cherished-MHSRIP.

## Acknowledgements

We express our heartfelt gratitude to all guides, tourists, national park rangers, tour operators, and other stakeholders who generously shared their cheetah sightings and photographs with us throughout this year. These valuable contributions have allowed us to track and document the unique life stories of individual cheetahs in their natural habitat.

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## Overview

Globally, many large carnivores in the wild face a severe threat of population decline (Inskip and Zimmermann 2009). Anthropogenic factors, such as changes in land use, incidental trapping, and conflicts with humans, are among the significant threats (Albert, Luque et al., 2018). Extensive efforts have been made to promote peaceful coexistence between humans and large predators worldwide. Moreover, there has been a shift in the conservation approach, emphasising the importance of considering the needs of wildlife while engaging local communities in culturally appropriate and meaningful ways to achieve better conservation outcomes; (Craig, Cardillo et al. 2004, Ripple, Estes et al. 2014).

One species currently facing a severe population decline is the African cheetah (Acinonyx jubatus) (Durant, Mitchell et al. 2017, Durant, Groom et al. 2022). Cheetahs are charismatic animals native to Africa and certain parts of Asia. They are "vulnerable" on the IUCN Red List, requiring urgent conservation attention. Presently, cheetahs can be found in 33 African countries, including Zimbabwe. Unfortunately, many countries where they reside lack the necessary capacity and financial resources to support cheetah conservation efforts, Field (Durant, Groom et al., (Durant, Groom et al. 2022).

Despite their renowned speed and aesthetic beauty, cheetah populations struggle in the wild. It is estimated that there are currently around 7,000 cheetahs remaining, with populations having been eradicated from 95% of their historical range, Field (Durant, Groom et al., (Durant, Groom et al. 2022). Threats to cheetah populations include land-use changes and conflicts with farmers over livestock. While these immediate threats contribute to cheetah decline, they are ultimately driven by various factors. These underlying drivers include political constraints, such as a lack of land-use planning, economic and political instability, low rainfall, and recurring droughts due to climate change, forcing rural communities to clear more agricultural land.

Additionally, a lack of awareness and political will to support cheetah conservation exacerbates the situation; therefore, addressing these underlying drivers is crucial to combating existing threats and garnering local community support and involvement. Moreover, due to their low population densities, cheetahs require more significant areas to survive than most other carnivores (Durant, Groom et al. 2022). Their sensitivity to environmental threats means that even slight disturbances can significantly negatively impact cheetah populations.

**The ecology of the cheetah**

Cheetahs are an apex predator in the savanna ecosystem. They are habitat generalists and can be found in many habitats ranging from open plains, woodland, savanna, and thick bush. Habitat preference is often determined by two main factors: (a) abundance of prey and (b) lack of other large predators such as lions and hyaenas. Generally, adult cheetahs prey on medium-sized antelopes (15-30 kg) and avoid areas with high prey densities to avoid prey-dependent large predators such as lions.

Cheetah males are often social (often found in permanent coalitions of two to three animals) and hold small territories, while cheetah females are solitary and have large home ranges. The sizes of territories and home ranges for males and females can vary greatly (from as little as 37 $km^2$ to as high as 3,000 $km^2$) across different landscapes. Males scent-mark their territory and defend it against intruders, whereas females tolerate other cheetahs in their home range that often overlaps with the home ranges of other cheetahs. Females move across several male territories annually and are highly promiscuous, and this can result in females giving birth to a litter with cubs from different fathers.

Cheetahs can survive up to 11 or 12 years in the wild. Females have their first litter at two years, while males start to breed at three years. Mating in cheetahs occurs throughout the year; the gestation period is 90-95 days, and litter sizes range from 3 to 5 cubs. The cheetah cubs are born with their black spots, and a Mohawk-type mane shed as the cheetahs grow older. Females raise their cubs on their own, and during the first two months of their lives, the females leave their cubs behind in a lair when they hunt. Cub mortality in cheetahs can be as high as 95%, while the recruitment of cubs is very low. This is because females rarely defend their cubs against larger predators, resulting in cubs being killed by other larger predators. On average, cubs stay with their mother for 18-22 months; during this time, the mother teaches them how to hunt and avoid other predators. After that, the mother leaves them behind to fend for themselves. Cubs usually stay together in sibling groups for several months before the males and females go their separate ways.

## The status of the cheetah population in Zimbabwe

In the early 1980s, Zimbabwe boasted the world's third-largest cheetah population (IUCN, 2016). However, significant changes in land use over the past four decades have had detrimental effects on the cheetah population (Williams, Williams et al. 2016). A nationwide survey between 2013 and 2015 revealed a staggering 90% decline in Zimbabwe's cheetah population, reducing from 1,500 individuals to an estimated 150-170 individuals in just 15 years (van der Meer 2016). The survey also identified three central cheetah populations in Zimbabwe: (a) the Zambezi Valley population, (b) the Hwange-Matetsi-Victoria Falls population, and (c) the Lowveld population. Among these, the Hwange-Matetsi-Victoria Falls population is considered the most viable, as it is connected to other cheetah populations in Botswana, Namibia, Zambia, and Angola through the Okavango Zambezi Transfrontier Conservation Area (KAZA TFCA).

Unfortunately, the current cheetah population estimates are still being determined due to the lack of active research on the species from 2015 to 2021. This information gap hinders the Zimbabwean Parks and Wildlife Management Authority (ZPWMA) and the International Union for Conservation of Nature (IUCN) from effectively translating national/regional conservation action plans into meaningful conservation strategies. We revitalised the Cheetah Conservation Project Zimbabwe (CCPZ) to address this issue in 2021. By utilising information and photographs contributed by the public, including safari guides and national park rangers, our objective is to gather baseline data to assess the decline and potential recovery of cheetah populations in Zimbabwe over the past seven years. This data will enable us to prioritise conservation efforts by understanding the cheetah's distribution, population size, and current challenges.

## Cheetah Conservation Project Zimbabwe

CCPZ aims to conserve cheetahs through applied research, education, collaboration, and capacity building. With our research, we strive to address questions that can help us improve cheetahs' conservation strategy. Moreover, we strive to build capacity in carnivore conservation by working with young Zimbabwean students and, where necessary, educating field staff about cheetahs, carnivore conservation and human-carnivore conflict mitigation.

**Team members**

- Dr Lovemore Sibanda (Project Director and PI)
- Mr Mkhululi Moyo (Research Assistant)
- Mr Malcolm Ngwenya (Research student from Midlands State University on work-related learning)
- Dr Esther van der Meer (Scientific Advisor)
- Dr Courtney Hughes (Scientific Advisor)
- Dr Ewan Macdonald (Scientific Advisor)
- Prof. Andrew A. Loveridge (Scientific Advisor)
- Prof. David W. Macdonald (Scientific Advisor)

**Methods**

Citizen science

In 2021, we developed a citizen science programme to encourage rangers, safari guides and tourists to send us information (i.e., sightings and photographs) on cheetahs. To encourage citizen scientists to send us information about cheetahs, we use several communication platforms/channels, such as a WhatsApp hotline that citizen scientists can use to submit cheetah sightings and photographs. We also have a dedicated cheetah sighting WhatsApp group with close to 100 active participants (consisting of guides, safari operators, and other researchers). We also administer a Facebook page, with over 8,000 members by the end of 2023, up from 6,500 followers in 2021, where we engage with citizen scientists by posting regular updates on cheetahs seen. Further, we also have the Cheetah Zimbabwe web page where citizen scientists can read about our work and contact information. Finally, we have over 300 posters in key tourist offices, national park rangers' offices and safari lodges in and around Hwange National Park and the Zambezi Valley.

*Secondary data*

We also collaborate with researchers such as the Painted Dog Research Trust, Bubye Valley Conservancy, and the TransKalahari Predator Programme. Our collaborators have shared information and photographs of cheetahs they encountered during their camera trap surveys in

different areas. Painted Dog Research Trust, led by Dr Greg Rasmussen, conducted a camera trap survey for painted dogs in the Victoria Falls NP and Kazuma areas. At the same time, the Laure carried out a camera trap survey around Bubye Valley. The TransKalahari Predator Programme led by Dr Andrew Loveridge carried our camera traps in the northern and western parts of Zimbabwe, including Gonarezhou. Although these camera traps were explicitly designed for other species, they can help give insights into roughly the number of cheetahs in an area.

**Preliminary results (2021-2023)**

*Cheetah Citizen Science Programme*

Since 2022, we have distributed 207 posters in local schools, shops, and clinics (key places where people will likely read about our work) around the Hwange National Park-Matetsi and Victoria Falls areas. In return, we received 359 photographs in 103 independent sightings from citizen scientists. This brings the total number of photos to 1,415 in **226** independent sightings in 36 months (Mean=**39.3** per month and 6.26 photographs per sighting.). The majority (>95%) of the sightings and pictures were submitted by safari guides, tourists, and tour operators. Other researchers and national park rangers submitted fewer cheetah sightings and photographs (<5%). Most of the sightings and accompanying pictures were from the Hwange National Park- Matetsi-Victoria Falls, followed by the middle Zambezi Valley, and a few sightings were received from the Lowveld population.

*Cheetah Population Estimates*

Overall, preliminary results suggest there are 83 (72-90 95% CI) adult cheetahs in the whole of Zimbabwe. The highest populations are estimated in the southern (e.g., Tuli Circle, Bubi Valley) and western regions of the country (Hwange NP, Matetsi, Victoria Falls National Park), part of the KAZA TFCA. This population estimate is approximately 50% lower than that reported than that reported in 2015, though we are careful about how we interpret this result because of the slight differences in methodology. Despite the low numbers, these unexpected results suggest that there could be fewer cheetahs than previously assumed and a need for more research on the causes of population decline.

Table 1: Cheetah Population Estimates 2023

| REGION | Description | Area ($km^2$) | Estimates |
|---|---|---|---|
| **Western** | Hwange National Park (HNP) | 14,900 | 16 |
| | Matetsi Units 1-5 | 1,934 | 4 |
| | Matetsi Units 6-7 and Zambezi National Park | 1,585 | 9 |
| | Ngamo & Sikumi Forest | 1,386 | 2 |
| | Gwaai Conservancy | 927 | 1 |
| | Hwange Communal Land (Mvuthu & Shana area) | 392 | 0 |
| | Tsholotsho buffer adjacent HNP | 1275 | 2 |
| **Subtotal** | | **22,399** | **34** |
| **Central** | Chizarira National Park | 1,948 | 2 |
| | Chirisa SA | 1,713 | |
| | Sengwa | 380 | |
| | Matusadonha National Park | 1,427 | 4 |
| **Subtotal** | | **5,088** | **6** |
| **Northern** | Omay | 1,865 | |
| | Chewore North | 1,648 | |
| | Dande | 1,155 | |
| | Hurungwe (Nyakasanga & Rifa) | 1,709 | |
| | Mana Pools | 1,287 | 14 |
| **Subtotal** | | **7,663** | **6** |
| **Southern** | Gonarezhou National Park | 5,053 | 5 |
| | Malilangwe | 400 | 14 |
| | Bubye Valley Conservancy | 3,230 | 8 |
| | Save Valley Conservancy | 4,100 | 4 |
| **Subtotal** | | **12783** | **37** |
| **TOTAL** | | **47903** | **83** |

*Mortalities and cub recruitment in cheetahs*

A healthy cheetah population needs to reproduce for it to thrive. In 2023, we received unconfirmed reports of 6 cheetahs that were supposedly killed by farmers near Shangani Area, 60 km from Gweru. Although this area is not a vital cheetah population stronghold, these could be cheetahs in transit between areas if the reports are accurate.

Our research findings indicate that cub recruitment, which refers to the number of cubs that successfully survive to adulthood, varied in our Hwange population, ranging from 0 to 3 cubs. Throughout 2021, we closely monitored three females with cubs. The first female, HNP046, gave birth to three cubs in January 2021, but unfortunately, they did not survive. The second female, HNP-47, had two cubs in June 2021, and only one cub successfully survived and

dispersed successfully. The third female gave birth to four cubs in August 2022, and fortunately, all four offspring are still alive.

While we have yet to determine the exact factors influencing the differences in cub recruitment among these females, the evidence suggests that various factors come into play. These factors may include the age of the female, the specific habitat conditions, and the presence or absence of other carnivores like lions and hyenas. Our observations align with similar research conducted in different areas, where cub recruitment rates are relatively low compared to other African regions. For instance, in the Serengeti, the cub recruitment rate was reported to be around 5% (Broekhuis 2018), while in another location, it was as high as 31%.

Overall, the survival of cheetah cubs is greatly threatened by other predators such as lions, leopards, hyenas, and sometimes large herbivores (Figure 3). These predators, sometimes herbivores, pose significant risks to the survival and well-being of cheetah cubs.

*Case report*

In July 2023, Cindy (cheetah HNP046) had an unpleasant encounter with lions this month and sustained severe injuries. Hwange National Park has about 20 adult cheetahs, and the survival of every individual is crucial if the cheetah population in Hwange and the whole of Zimbabwe is to recover. Other than anthropogenic-related causes, cheetahs are threatened by other carnivores such as hyenas, leopards, and lions. On the 11$^{th}$ of July 2023, we received a disturbing WhatsApp message from a local guide and our friend Mr Bheki Sangweni from African Bush Camp – Cindy (cheetah HNP046 was attacked by a lioness and was seriously injured. When we got to the scene, the seven-year-old female was in a very terrible state, and the vets thought she had a 50% chance of making it alive. A few days later, Cindy was still in one place and had only walked about 60m. She had not fed well for days and had not drunk either. To worsen the situation, Cindy has two subadult cubs strongly dependent on her for almost everything- from hunting prey to avoiding enemies. On their own, before they reach 18 months of age, the cubs rarely survive. With help from the national parks Vet, Dr Kudzai Mupondi, Cindy was given some antibiotics (Figure 4). Since then, Cindy has been recovering well, and her last sighting on the 21$^{st}$ of July 2023, she was on an impala kill that she managed to kill herself. This is evidence that our intervention worked well. We are so grateful to Dr Mupondi, the parks team, and all the guides who closely watched Cindy and sent us regular updates.

*Prey selection and attacks on livestock*

Cheetah populations do well outside protected areas and are prone to conflict with local livestock farmers even though evidence suggests cheetahs prefer wild prey over domestic Fields (Durant, Groom et al., (Durant, Groom et al. 2022). Reports of cheetah attacks on livestock were lower in 2023 compared to 2022. The only report we received this year is that of six cheetahs that were killed near Shangani for conflict-related reasons. In 2022, we received several reports of cheetahs killing livestock in the Hwange and Lupane Districts. A total of 11 goats and one calf were reported to have been killed by cheetahs this year. The majority of incidents occurred in Kasibo village near Hwange town. In this resettlement village, a total of 10 goats were killed between October and December. We verified the incidents and are confident that three cheetahs are in the area, though we have yet to positively identify the animals. We suspect it's a female and two subadults. We reported the incident to the park ecologist at Main Camp. Since early December, we have never received further reports.

Generally, cheetahs predominantly target wild prey over domesticated prey. Based on the information obtained from photographs, it is evident that cheetahs in Hwange National Park hunt and feed on a variety of animals such as kudu, young zebra (Figure 5), young sables, reedbucks, young wildebeest, waterbucks, impalas. Our next objective for the upcoming year is to investigate the potential influence of factors such as age, sex, and group size on cheetahs' prey selection.

**Conclusions**

Through our work, we have shown that we may have fewer cheetahs than previously assumed. Cheetahs are known as specialist species, thriving in and outside protected areas. Unlike other cheetah habitats, such as Namibia, conflicts with local farmers in Zimbabwe are minimal. An essential next step is to gain a comprehensive understanding of the cheetah population dynamics; it is crucial to determine the extent to which cheetahs leave the country and migrate to other areas. Additionally, we need more essential information regarding the average lifespan of our cheetahs, the percentage of recruitment, and other vital data necessary for effective population monitoring. Acquiring these details will significantly contribute to the monitoring and conservation efforts to preserve our cheetah populations.

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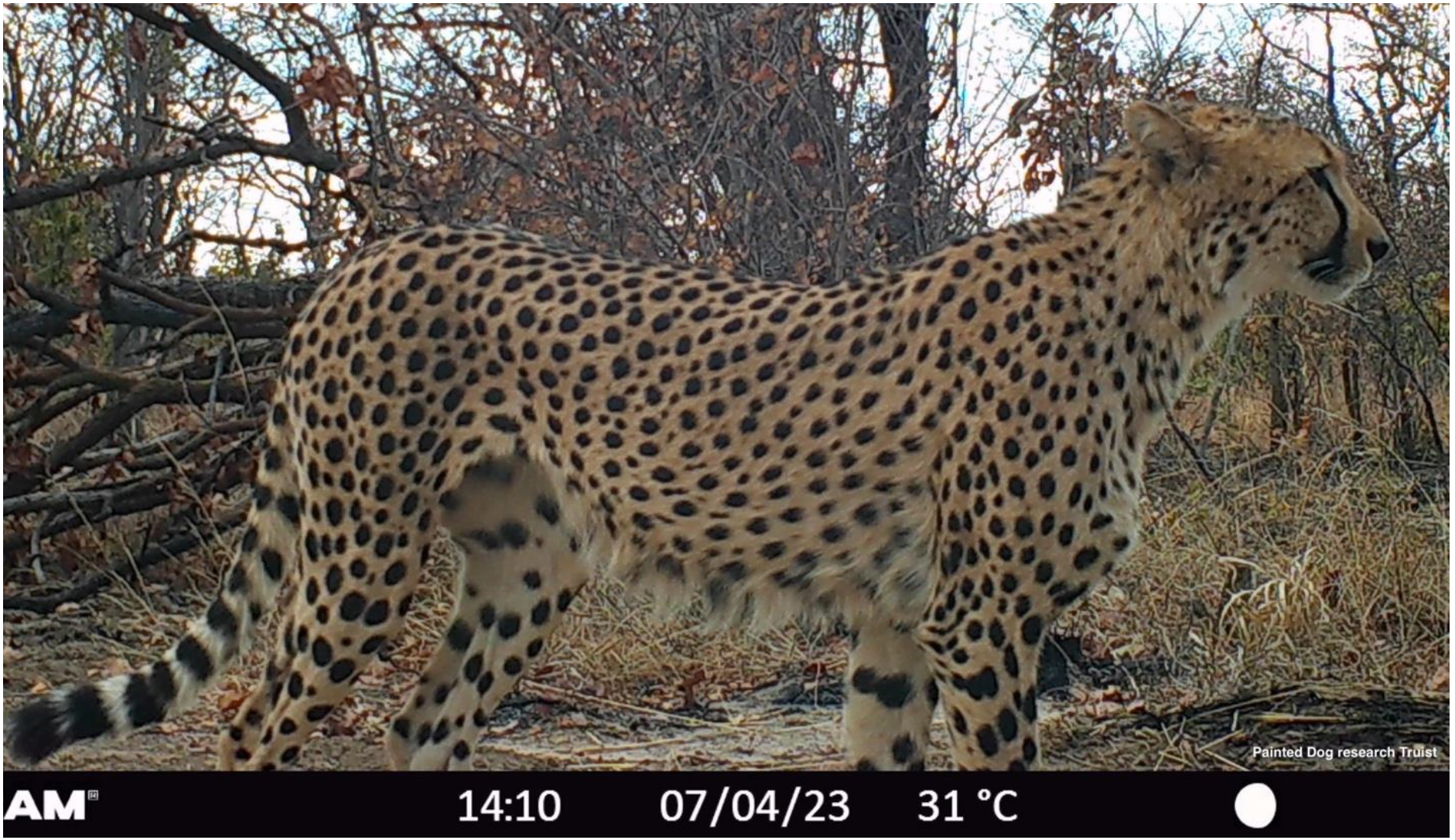


**Figure 1**: A cheetah caught in a camera trap set up by our friends, the Painted Dog Research Trust led by Greg Rasmussen and his team in Sizinda

**Figure 2**: Cheetah cubs charged by a hippo in Hwange National Park, © The Hide Safari Lodges.

**Figure 3**: Photograph of a male cheetah in Hwange National Park feeding on a zebra © Imvelo Safari Lodges.