Final Evaluation Report

Your Details	
Full Name	Dr Lovemore Sibanda
Project Title	A cheetah citizen science project in Zimbabwe
Application ID	35213-1
Date of this Report	January 2023

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
To use non-invasive methods (citizen science method) to determine the status and distribution of the cheetah population in southwest Zimbabwe				The Cheetah Zimbabwe citizen science programme is up and running. We were able to collect reliable information to assess the current population status of the cheetah in Zimbabwe - an area which previously had no reliable and up to date. Our preliminary results suggest there may be a total of 13 adult cheetahs in the Hwange-Matetsi-Victoria Falls area which is the last population stronghold, and this area is also part of the wider Okavango Zambezi Transfrontier Conservation Area (KAZA TFCA). These unexpected results suggest there could be fewer cheetahs than assumed.
To provide in-situ education to raise awareness and educate field staff about cheetah				We visited 78 schools, and we gave talks to school children, who happen to be future generations, on the plight of cheetahs in Zimbabwe and explaining how to differentiate the cheetah from other carnivores. We left educational posters for school children in all schools that we visited. Moreover, we gave four talks to tourists groups that visited our research project (n=2), another talk during the Hwange National Park Annual 24-hour game count and another talk to a conservation community in Bulawayo. We are satisfied we achieved this objective fully.
To distribute posters in areas in safari camps, local schools, shops and clinics to encourage people to send us information on cheetahs in their areas.				We distributed 707 'help me find the cheetah' posters across all 52 safari camps, 78 schools, 89 local shops/clinics to educate and to encourage citizen scientists to send us cheetah information. We did not encounter any problems.

2. Describe the three most important outcomes of your project.

a). Outcome 1: Cheetah Population Estimates in Zimbabwe (preliminary results)
During the period January-December 2022, we distributed a total of 707 posters in all safari camps in and around Hwange National Park, Matetsi and Victoria Falls areas. This includes local schools (n=89), shops (n=117) and clinics (n=31). We aimed to put these posters strategically in key places where people are likely going to read about our work and, thereafter, send us cheetah sightings and photographs. Sightings help us to establish where cheetahs occur, and pictures help us to identify individual cheetahs.

In return, we received a total of 1,415 photographs in 226 independent sightings (an average of 6.69 photographs per sighting; 117 pictures per month). The majority (>95%) of the sightings and photographs were submitted by safari guides, tourists and tour operators. Other researchers and national park rangers submitted fewer (<5%) cheetah sightings and photographs.

Figure 1: Student at a local school in north-western Zimbabwe reading a cheetah Zimbabwe poster © CCPZ. Posters in schools help educate school children on the plight of cheetahs in Zimbabwe.

Overall, results suggest there may be a total of 13 adult cheetahs (four females and nine males) in the whole of Hwange National Park-Matetsi-Victoria Falls (which is also part of the KAZA TFCA). According to van der Meer (2015), Hwange National Park-Matetsi-Victoria Falls is one of the last population strongholds. The 2022 population estimate is 66% lower than that reported for the same area in 2015 (n=42). These unexpected results suggest there could be fewer cheetahs than previously assumed

and, hence there is a need to actively monitor and assess the threat to wild populations.

Figure 2: Cheetah cubs in Hwange National Park. This image was sent to us by a lodge operator, and we were able to retrieve information and monitor their life histories.

b). Outcome 2: Mortality rates in our population are high

A healthy cheetah population needs to reproduce for it to thrive. As of December 2022, there were about five cubs (Figure 2). However, our findings suggest cub mortality in our Zimbabwean population is seriously very high. For example, in 2021, female cheetahs HNP046 and HNP047 had four and three cubs respectively. Of the seven cubs, only one cub made it to adulthood. These results suggest the mortality in cheetah cubs, like in most rangelands, is exceptionally high resulting in low (less than 15%) cub recruitment (i.e., the number of cubs that successfully survive to adulthood). Moreover, our findings suggest other predators (lions, leopards, hyaenas and baboons), and bushmeat poaching contribute to the observed high mortality rates in cheetah cubs.

Figure 3: Dr Lovemore examine a cheetah carcass that was killed by lions near Ivory Lodge. The animal (Cheetah HNP103) was born in Jan 2021 and had a dislocated hip joint from a zebra kick and couldn't outrun predators © CCPZ.

c). Outcome 3: Conflict with humans over livestock

Very little information exists on human-cheetah conflict in our area. During our data collection, we received several reports of cheetah killing living livestock in the Hwange and Lupane District. A total of 11 goats (estimated cost = USD 330) and 1 calf (estimated cost: USD300) were reported to have been killed by cheetahs this year (total estimated post per year= USD630). The majority (>75%) of these attack incidents occurred in Kasibu village near Hwange town. Kasibu village was previously a private wildlife farm that was reclaimed by the government, during the fast-track land reform in 2000 and because of its proximity to Hwange National Park, which makes Kasibu a crucial wildlife corridor that links wildlife populations in Hwange National Park and those in the Zambezi Valley. In Kasibu village, we recorded a total of 10 goats killed by cheetahs between October and December 2022. We verified the incidents, and we are certain that there are three cheetahs in this area, though we are yet to positively identify the animals responsible. We suspect it is a female and two subadult cubs. We reported the incident to the park's ecologist at Main Camp and, since early December, we have never received further reports.

The second incident is that of two male cheetahs in Lupane in June this year. On 14th June 2022, we received a report of two cheetahs killing livestock at Shabula village near Lupane. A calf and goat were killed in a space of three days. The report was from the authorities at Lupane State University. We went to the area and verified the incident. We recorded the spoor of two male cheetahs. To our surprise, a week later, cheetah males HNP052 and HNP053 appeared in Bomani concession, 20km from where a report of cheetah killing livestock was recorded. Coalition HNP052 and HNP053 were born in Hwange National Park in 2017. They dispersed in 2019 and they were photographed at Sengwa Area (Zambezi Valley region) in 2020. We presume the two animals killed the goat and calf on their way back from the Zambezi Valley region. We are currently in the process of writing up this movement for publication in a science journal as this movement story highlights that cheetahs disperse over large distances and that our understanding of which dispersal routes they prefer is limited.

Our work has formed a solid foundation for longer term cheetah monitoring in the area. Estimates from the survey, and photo IDs developed for individuals, will form a baseline for long-term population monitoring.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

- Fluctuations in GBP/USD exchange rates from 1GBP=1.30USD in May 2021 when we submitted our grant application to 1GBP=1.15 USD in November 2022.

- Fluctuations in fuel prices because of the Ukraine-Russia crisis. For example, the price of diesel increased from USD1.40 in May 2021 to as high as USD2.00 per litre by May 2022. By December 2022, the price of fuel was USD$1.85 (GBP1.60) per litre. To avoid this sudden change in prices, we bought our fuel in bulk directly from the suppliers.

- The printing of our educational comic book in South Africa was slow because of the Russia-Ukraine crisis. We are in contact with the production company, and we are expecting our first delivery in mid-January (14/01/2023).

4. Describe the involvement of local communities and how they have benefitted from the project.

As part of the citizen science project, we visited communities bordering wildlife protected area educating and informing them about cheetahs. During our visits, we encouraged communities, including national park rangers, safari guides and school children to let us know of any cheetah sightings in their area. By so doing, this may have enabled the general public to actively participate in research which is not always common in most research. In terms of benefit, the communities benefited some knowledge on cheetahs, and they also got an opportunity to contribute actively participate in cheetah conservation.

Figure 4: Dr Lovemore Sibanda giving a talk to Wildlife and Environment Zimbabwe (WEZ) Matabeleland group of wildlife enthusiasts on the 27th of August 2022 © CCPZ.

5. Are there any plans to continue this work?

Certainly, for the next 3 years (2023-2025), our approach is to continue to use non-invasive research methods (i.e., citizen science) to collect robust, systematic, quantitative data on cheetah observations by engaging park rangers; tour guides/operators; tourists (international/national), and community members/villagers

to monitor the population in Zimbabwe. Repeating data collection will not only increase the predicting power of our data but will provide more reliable cheetah population estimates. We will be applying to the second round of the Rufford Foundation grant.

6. How do you plan to share the results of your work with others?

There are several ways in which we will share our results:

- Our annual report which will be sent to all stakeholders.
- Articles in the local media to inform the national public about our work and preliminary results of the survey.
- Social media (e.g., Facebook: Cheetah Zimbabwe) to inform the international public about our work and preliminary results of the survey.
- Via our website and all our social media platforms.
- Once we have carried out three more surveys to get a more refined estimate, completed a final report will be written which will be as widely distributed as possible at both a national and international level.
- Papers in peer-reviewed scientific journals

Figure 5: Work published about cheetahs in local magazine. © CCPZ.

7. Looking ahead, what do you feel are the important next steps?

The important next steps are:

- Repeat the data collection to improve the predictive power of our data.
- Keep the cheetah momentum going by generating PR and providing information via social media.
- Keep the relationships and collaborations with colleagues going to facilitate data sharing.
- Build capacity in conservation by working with people in the field.
- Share this report as widely as possible.
- Conduct a questionnaire survey to assess factors that motivate participation by citizen scientists.
- Present the preliminary results at the International Human Wildlife Conference to be held in Oxford on the 29th of March to the 1st of April 2023 as well as the SCCS Cambridge conference to be held on the 27th to the 30th of March 2023.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

The Rufford Foundation logo was used in our annual report 2022, our website, poster presentations, PowerPoint presentation and on our "help us find the cheetah' posters.

9. Provide a full list of all the members of your team and their role in the project.

Lovemore was responsible for overall project implementation and management, procuring equipment, budget management and reporting. Lovemore liaised with all stakeholders with regard to planning and feedback. He also organised and facilitated the training of citizen scientists both online and in the field and oversaw data collection. He is also responsible for managing and sorting data, including individual identification of cheetah photographs collected. Lovemore will write up the final report and all manuscripts for publication. Moreover, he will continue to liaise with stakeholders regarding survey results and cheetah monitoring as a continuation of the project.

Mkhululi Moyo was our research assistant, he joined the project in June 2022, and he assisted Lovemore with fieldwork and poster distribution. Moreover, he is the project's handy-man and the community liaison officer.

Professor David Macdonald is a scientific advisor to this project. He raised funding to pay the PI's stipend. He assists in the overall administration of this research project. He will review and comment on draft manuscripts.

Professor Andrew Loveridge is also a scientific advisor to this project. He was involved in budget management, and he will review and comment on draft manuscripts. Professor Loveridge oversaw the WildCAT trust account where the funds were held in Zimbabwe.

Dr Esther van der Meer is also a scientific advisor to this project. She was involved in budget management and she will review and comment draft manuscripts. Dr van der Meer oversaw the Cheetah Foundation trust account where the funds were held in the Netherlands.

Dr. Ewan Macdonald is a scientific adviser to this project. He will review and comment on draft manuscripts.

Dr. Courtney is a scientific adviser to this project. She will review and comment on draft manuscripts. She assisted the PI in survey design and reviewing the RF grant application.

10. Any other comments?

No further comments. We would sincerely like to thank The Rufford Foundation for their support, without this support. None of this would have been possible.