Final Evaluation Report

Your Details	
Full Name	Brian Ochieng Otiego
Project Title	Vulture Abundance, Distribution, and Species Diversity along a Gradient of Anthropogenic Effects in Nairobi National Park, Kenya.
Application ID	39041-1
Date of this Report	31st May 2024

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
Develop a baseline data on the vulture abundance and species diversity at Nairobi National Park (NNP).			✓	Since vultures are generally long ranging birds, data on abundance and species diversity within Nairobi National Park (NNP) and Olerai Community Wildlife Conservancy (OCWC) were obtained by surveying nests. White-backed vulture (*Gyps africanus*) is the only species of vulture that currently breeds in the two study areas (NNP = 42 breeding pairs, and OCWC = 18 breeding pairs). However, Ruppell's vulture (*Gyps rueppellii*), who are cliff nesters, were also recorded in the two study areas, not breeding but probably visiting from the Kwenia cliffs (Shema 2019) for foraging. In NNP, Ruppell's vulture was often congregating with white-backed vultures at a water pool, cooling themselves from the scorching sun.
To develop the distribution map of vulture breeding sites within Nairobi National Park to guide informed decision-making for management of the park's habitats by Kenya Wildlife Service (KWS) into			✓	Using GPS coordinates of documented nests within NNP, a map showing the distribution of the 42 white-backed vulture nests was developed and shared with NNP's Science and Research department. Unlike in OCWC where white-backed vulture nests are confined along the riparian habitat, in NNP,

the future				they are distributed widely across three different habitats (open bushland = 24, riparian woodland = 17, and one occurring in the forest habitat). I am working closely with the park's security and research department towards rolling out a long-term nest monitoring protocol.
Create public awareness on the need and importance of vulture conservation through a robust public education and community outreach		✓		Vulture conservation awareness was undertaken within human-wildlife conflict-prone dispersal areas in eight villages: Emparua, Looselia, Olng'ania, Lasari, Indupa, Upper Olngulului, Kilonito and Duka Moja within Kilonito, Ildamat and Elangata Uwas. *Data source: ©Nature Kenya (EANHS) – Human-wildlife conflict consolidated database 2020-2023.* Overall, 799 local community members were reached with messages creating awareness on the plight of vulture conservation while advocating against wildlife poisoning. Community members were enlightened on the negative impacts of wildlife poisoning on vultures, households, and the environment. Awareness creation on vultures was done but more efforts are needed within the vast wildlife dispersal area which falls within the pastoral community lands. A one-time awareness creation may not yield the needed impact but continued awareness creation will

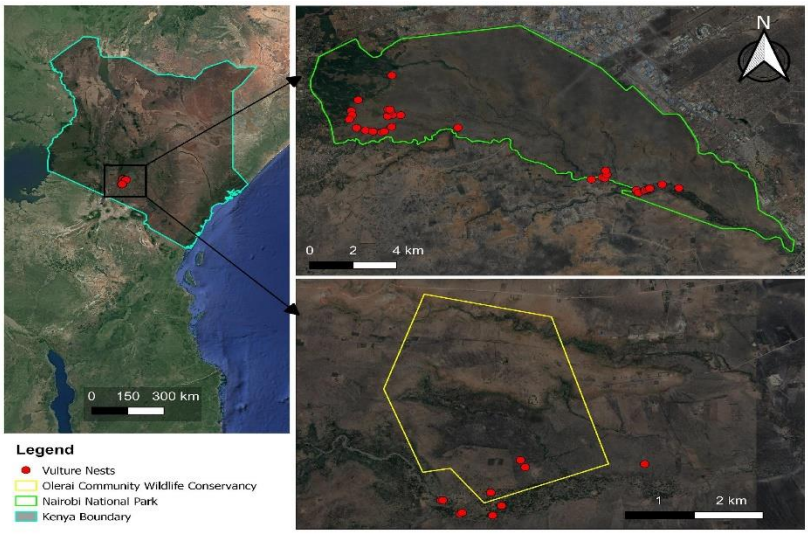
				surely achieve a positive impact towards saving vultures
Investigate community perception and attitude about vulture conservation			✓	After creating awareness on vulture conservation, we later interviewed 271 community members who were willing to participate in the interviews. Out of the 271 questionnaire forms, 250 had sufficient data to be processed for analysis. To address the threat of wildlife poisoning, 95% of respondents agreed that raising awareness could help mitigate incidents of wildlife poisoning. Indicating strong support for public education and awareness creation initiatives as an approach to enhance the community's understanding of the impacts of this act.

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

a). NNP as a critical breeding ground for endangered White-backed Vultures

Among the eight vulture species occurring in Kenya, our survey recorded white-backed vulture as the only vulture species breeding in the two study areas. Shema (2019) had reported 21 nests in OCWC and 37 in NNP. This survey notes a decreased number of nests in OCWC (n = 18; 18 breeding pairs) and an increase in nests recorded in NNP (n = 42; 42 breeding pairs). The high number of nests recorded within NNP seems to confirm the observation that this critically endangered species persists mostly within well protected areas like national parks (Thiollay 2006; Bamford et al., 2009; Moleón et al., 2020).

This project reports a wide distribution of white-backed vulture nests across three different habitats (open bushland, riparian woodland, and one occurring in the forest habitat) within NNP as opposed to the exclusive preference for riparian habitat (Monadjem 2001; Monadjem 2005; B. Otiego, personal observation). This indicates that lack of riparian vegetation does not necessarily stop white-backed vultures from nesting (Tarboton and Allan 1984). This underpins NNP as an important refugia for the critically endangered white-backed vulture population (*See map below for white-backed vulture nest distribution*).



Map displaying the distribution of White-backed Vulture's nests in NNP and OCWC.

b). Honeybee combs attached beneath white-backed vulture nests.

This project reports a rare occurrence of honeybee combs attached under white-backed vulture nests (six out of 13 nests) during an initial survey in OCWC. This is the first record of such occurrence associated with vulture nests that I could find. While bees have been observed utilising the nests of other raptors, the potentilal benefits and drawbacks for vultures remain unclear. On the one hand some researchers suggest bees might offer protection against predators like baboons attacking chicks in the nest (S. Thomsett pers. comm). However, others report instances of bees attack causing disturbance to nesting raptors (J. Oduori, pers. comm.).

Furthermore, a study in Namibia by Bridgeford & Kolberg (2013) documnetd honeybees around the eyes of lappet-faced chicks, potentially leading to vision impairment and even chick mortality. Larger chicks were observed hiding their heads under their wings, likely to escape persistent disturbance by bees that were seen flying around the nest and the chick.

The observed association of honeybees with vulture nests therefore, introduces an area of potential study to understand the balance between potential protective benefits and negative impacts on vulture nestling caused by honeybees (*See picture below*).

Picture of honeybee comb attached under the White-backed Vulture's nest in OCWC.

c). Widespread Recognition of Vulture Decline

Our interviews revealed a high level of awareness regarding vulture decline, with 97% (n = 232) of respondents acknowledging the population decrease. This highlights the pervasiveness of the issue. Wildlife poisoning emerged as the most prevalent method of retaliation against livestock predation, reported by 58% (n =110) of respondents. This aligns with research by Ogada et al., (2011), suggesting that deliberate poisoning of carnivores by humans is likely the most widespread cause of vulture poisoning.

Nonetheless, there are promising signs as 30% (n = 57) of respondents mentioned using non-lethal methods like guard dogs to deter predators, offering alternative solutions. The effectiveness of the awareness campaign is evident, as 92% of respondents came to recognise the importance of vultures, with the majority (96%) specifically valuing vultures' role in clearing carcasses and helping to reduce the spread of zoonotic diseases that could affect their livestock. This understanding of vultures' ecological role is critical for garnering local community support for vulture conservation. (See photos below for some awareness meetings).

Left: Community awareness meeting held with village members at Indupa village (-1.859582, 36.618605) on 18/12/2023, and Right: Community awareness meeting held with village elders and leaders at Kilonito village (-1.788507, 36.611155) on 13/12/2023.

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

Long wait for project permit

The process of acquiring permits to conduct this study took longer than earlier anticipated, which contributed to a 2-month delay. There was no remedy for this delay as the due process had just to be followed. The delay period was used to procure equipment that needed to be sourced from outside the country and to make contact with the community in readiness for project implementation. However, subsequent projects are expected not to undergo similar challenges since the permitting institution now has a better understanding of project scope and activities besides a good rapport established with the institution through data sharing and constant communication.

Foreign exchange rate

During the project implementation, the Kenya Shilling lost strength against its main trading foreign currencies i.e. US Dollar. As a result, the initial budget was impacted by the increased cost of commodities, some of which were essential to this project implementation such as motor vehicle fuel. In the later stages of project implementation, the cost of vehicle hire was cushioned through support from Nature Kenya who provided field vehicle to ensure successful delivery of this project.

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

For the success of community meetings, local administrators and community leaders were engaged during planning and awareness meeting presentations. This was a very

critical platform that the community learnt of the ecological and socio-economic benefits of vultures. The community members were also made aware of the unseen harmful effect of lacing carcasses with poison noting that the poisonous substances used to target carnivores/predators can also kill the handler if mishandled. Community members understood that the harmful chemicals can equally end up contaminating the water source they depend on.

Olerai Community Wildlife Conservancy rangers greatly supported the vulture nest survey and in the process, they learned a lot about vulture species identification, nest survey and documentation. This also included but was not limited to scanning the nest using a scope and taking coordinates of a nest using a handheld GPS kit.

Most of our food supplies were sourced from the local community's farms and so part of this project's budget directly supported the local community's livelihood.

5. Are there any plans to continue this work?

Yes.

Athi–Kapiti ecosystem is a very important wildlife dispersal area that connects Nairobi National Park to Oldonyo Sabuk and Amboseli National Parks. This significant ecosystem spans a size of 14,646 ha hosting 10 conservancies with 1777 households. Therefore, there is a critical need to expand nest surveys beyond Olerai Community Conservancy which is among the 10 conservancies within the Athi–Kapiti ecosystem. More systematic awareness creation is needed to reach the 1777 households, towards increasing community understanding of vultures' ecological role while highlighting how communities can contribute to vulture conservation.

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

The location of the documented white-backed vulture nests was shared with Nature Kenya, Birdlife International partner in Kenya. The data has since been uploaded to the Avian Sensitivity Tool for Energy Planning (AVISTEP) to support the expansion of renewable energy infrastructure with careful consideration of the potential impacts on birdlife and biodiversity.

An article on the results of this study was shared with the Kenya Birding Magazine editor and has been accepted for publishing in the Kenya Birding Magazine Issue 18.

I am equally intending to publish the results of this study in a peer-reviewed journal.

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

- Expanding the survey of vulture breeding sites remaining within Athi – Kapiti ecosystem (community-owned/private lands) is very important towards collaborating with the community and landowners in protecting such critical remaining habitats.

- Roll out a long-term nest monitoring of the documented nests starting with Nairobi National Park.

- From this project's assessment of community perception, there were two concerns that clearly came out from the community members reached:
  i. There is a need to carry out more awareness creation and public education on the plight of vulture conservation while advocating against wildlife poisoning.

  ii. Wildlife poisoning is a common but silent approach of retaliating to livestock predation. There is dire need to conduct training to the Athi – Kapiti conservancies' rangers on the implementation of rapid response to wildlife poisoning. This will be critical in mitigating the ripple effect of wildlife poisoning.

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 data sheets and questionnaires, and awareness creation materials that included banners and t-shirts. Both the local community and the wide range of people visiting Nairobi National Park interacted with the logo presenting the foundation to the general public.

I attended Kenya's 1st Wildlife Scientific Conference, Theme: *Use of Wildlife Science for Enhanced Biodiversity Conservation and Improved Livelihood*. One day at the conference, I was dressed in a t-shirt branded with the Rufford Foundation logo. This gave the foundation both national and international publicity among scientists and policy makers (*see pictures below*)

Pictures taken at the Wildlife Scientific Conference held in Kenya between 26th & 28th September 2023, where The Rufford Foundation received a wide range of publicity.

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

Name	Position	Responsibility
Brian Ochieng' Otiego	Principal Investigator (PI)/ Team Leader	Organized all the project activities and associated logistics ● Data collation and analysis ● Project update and reporting ● Dissemination of the project results
John Musina (Research Scientist at the Ornithology section of National Museums of Kenya)	Lead scientist	He took the lead in designing the nest survey data sheet and supported the effective implementation of the project.
Elphas Bitok and James Mathenge	Research Scientist	Representing Nairobi National Park, and Wildlife Research & Training Institute
Faith Achieng'	Research Assistant	Project coordinator at The Peregrine Fund. She supported the project as the main scriber documenting vulture nests
Fridah Kalekye	Research Assistant	Vulture liaison officer at Nature Kenya. She supported the project as the lead local project assistant. Coordinated awareness creation and questionnaire administration.
Stephen Likama (Senior Chief), Daniel Pursaen (Asst Chief) Taiko Nakulyen (Assistant Chief) and Jackson Williams.	Local project assistant	They were critical in linking the project team with the community. They supported in mobilizing the community towards awareness creation meetings. They supported translation of questionnaire questions to the local language whenever it was necessary to ensure clarity of the questions.
Joseph Letaari and David Kisioki (Olerai Community Conservancy rangers).	Local project assistant	They guided in the nest surveys within Olerai Community Conservancy since they understand the terrain so well.

Backson N Masari (KWS Officer) and Lydia Mokeira (KWS Officer)	Community engagement	Presented during awareness creation helping the community to understand the process of claiming compensation on human-wildlife conflict incidents

10. Any other comments?

I thank The Rufford Foundation for generously providing a research grant to actualise this study. The community appreciated the significance of public education and awareness creation indicating that the awareness component of this project had a positive outcome to the community members.

Through this project, I have made a collaborative network with conservation institutions working with vultures and other birds of prey i.e. Vulpro and Kenya Birds of Prey Trust. As a result, they are supporting the development of a nest monitoring protocol that is currently being tested for long-term nest monitoring for vultures and other resident birds of prey. Monitoring of the documented nests is a very essential step which will allow for better assessment of vulture population productivity in these critical habitats.