2023 IMPACT REPORT

Kenya Vulture Conservation Project

natureVest | The Nature Conservancy

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Cover: A Rüppell's Griffon Vulture joins the feeding mob on a carcass. © Bobby Neptune; This page: Rüppell's Griffon Vultures roost on tall vertical cliffs and bring up their young on the relative safety of these perches. © Bobby Neptune

INTRODUCTION

I am pleased to introduce the first annual impact report for the Kenya Vulture Conservation Project. In this report we reflect on the on- and off-site conservation and community impact work completed during the first 2.5 years of commercial operations for the Kipeto Energy wind farm.

In November 2020, The Nature Conservancy (TNC) arranged a loan agreement to help finance the Kipeto Energy wind farm. This loan was made by Kenya Vulture Conservation, LLC with funding sourced from TNC and private impact investors. The primary conservation focus of the Kenya Vulture Conservation, LLC loan was to promote vulture conservation alongside renewable energy production. In the following pages we provide updates on the on-site mitigation efforts to reduce impacts of wind turbines on priority bird species and the off-site approaches we are taking to monitor local vulture populations and educate local communities on human-wildlife conflict and actions they can take to slow the decline of vulture populations.

We remain committed to working with the Kipeto Biodiversity Committee and its local non-profit partners, in partnership with local communities, to reduce negative impacts to and create positive benefits for local vulture populations. Thank you for your continued support.

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BACKGROUND

The Kenya Vulture Conservation Project was launched in 2020 when Kenya Vulture Conservation, LLC provided a $10 million fixed-rate loan to the Kipeto Energy (Kipeto) wind farm located in Kajiado County, 45 km southwest of Nairobi Kenya. In the loan agreement, Kipeto committed to provide annual funding for critical conservation initiatives focused on vulture conservation throughout the life of the project. Use of this funding is governed by the biodiversity sub-committee of Kipeto's Board. Kenya Vulture Conservation, LLC maintains a seat on the Biodiversity Committee through which it provides technical assistance for the implementation of the Kipeto Biodiversity Action Plan (BAP), which includes both onsite mitigation efforts and offsite vulture conservation activities. The Kipeto wind farm commenced commercial operations in July 2021.

The conservation goals of the Kenya Vulture Conservation Project include:

- promoting vulture conservation in the area served by the wind farm by ensuring annual funding from Kipeto is provided to community-based vulture conservation initiatives;
- providing direction, support and oversight for such vulture conservation activities; and
- demonstrating the feasibility of innovative renewable energy investment structures to generate sustainable and scalable long-term funding support for environmental conservation in Africa.

Right: A White-backed Vulture in Olerai Conservancy's vulture sanctuary in southern Kenya looks over a juvenile in its nest. White-backed Vultures will roost in colonies in the tops of trees. © Bobby Neptune

KIPETO WIND POWER PROJECT

Renewable Energy & Onsite Mitigation

The Kipeto wind farm is the second largest wind power project in Kenya. Covering an area of approximately 70km^2, there are 60 wind turbines capable of generating 100MW of power, enough to power approximately 250,000 homes[1]. The terrain of the land around Kipeto, which makes it an attractive wind farm location, also draws soaring birds who can traverse the area and expend less energy as they can soar on the warm air currents. This, however, can lead to birds striking wind turbines, resulting in bird population impacts.

According to the International Union for Conservation of Nature's (IUCN) Red List of Threatened Species, of the nine vulture species found in Kenya, four are critically endangered[2]. The Kipeto Biodiversity Committee has identified several priority bird species, including the Rüppell's Vulture, White-backed Vulture, Martial Eagle and Verreaux's Eagle, as being of particular concern in the region of the Kipeto wind farm. To avoid bird strikes, Kipeto has taken steps many wind farms do not implement and employs a team of monitors who observe bird activity during all operational daylight hours from eight vantage points on the wind farm to identify birds of prey at collision-risk height as well as animal carcasses that may draw bird activity to the area. When these monitors observe a priority species flying close to a wind turbine at collision-risk height, they shut that specific turbine down, typically in under 60 seconds. In 2023, there were a total of 1,108 shutdowns. The average downtime per turbine shutdown in 2023 was 3 minutes, 42 seconds, leading to a loss of only approximately 0.01% of the total energy generated by the wind farm in 2023.

In 2023, there was one priority species fatality at the wind farm, a Verreaux's Eagle (representing just 0.09% of 2023 sightings and shutdown events). This fatality happened while the turbine was in the process of being shutdown due to observations of another Verreaux's Eagle flying near the turbine at collision-risk height. Since the launch of commercial operations in 2021, there have been a total of four priority species fatalities at the wind farm. Since the Kipeto wind farm has not been run without the shutdown procedures, we cannot know definitively how the shutdown program has impacted the number of bird strikes. However, according to a recent study on vulture strikes on wind farms in Spain, bird fatalities averaged 1.33 birds per turbine per year when no shutdown procedures were in place[3]. Since launching 2.5 years ago, the Kipeto wind farm has averaged 0.03 priority species fatalities per turbine per year, 98% lower than the average observed in the Spain wind farm study.

In 2023, 39 non-priority bird species and 44 bat fatalities were identified at the wind farm. As bat fatalities increased this year, Kipeto elected to support a one-year study to collect bat population data, behavior and other demographic data in the wind farm and surrounding areas. This study data will allow the Biodiversity Committee to identify and implement the most effective bat strike mitigation measures in the future.

Right: Wind turbines from Kipeto wind farm at sunrise. The wind farm is located on the edge of Africa's Great Rift Valley and on a ridgeline frequented by soaring raptors. © Bobby Neptune

OFFSITE MITIGATION AND MONITORING

The conservation funding provided by Kipeto related to the Kenya Vulture Conservation, LLC loan is split amongst several local non-profit organizations working to implement the Kipeto Biodiversity Action Plan. The BAP includes projects focused on 1) reducing human-wildlife conflict, 2) ensuring the preservation of endangered species of vultures through vulture population monitoring, and 3) improving livelihoods within local communities. Specific activities supported by the BAP are described in further detail below.

Human-Wildlife Conflict—a Three Stage Approach

Although fatalities from wind turbines are important to minimize and hence are very actively avoided at Kipeto, the leading cause of vulture population decline in this region is human-wildlife conflict resulting primarily from retaliatory poisoning of livestock carcasses in an attempt to kill predators such as lions. Local herders, at times, lace the carcass of their hunted livestock with poison in an effort to kill predators that are attacking their herds. Unfortunately, an unintended consequence of this is the poisoning and killing of the local vulture population who feed on these poisoned carcasses—a single poisoned carcass can kill dozens of vultures. The BAP seeks to reduce human-wildlife conflict in the area through community outreach and livestock protection.

Left: Rüppell's Vulture, Kenya © Beks/Unsplash

HUMAN-WILDLIFE CONFLICT—A THREE STAGE APPROACH

1 *Community Outreach*

A local non-profit working with the Biodiversity Committee has created a team of 5 Vulture Liaison Officers and 65 Vulture Volunteers who work across five hotspots in the local community to host community outreach programs, document human-wildlife conflict incidents and identify wildlife poisoning events for rapid response.

Regular community events are held to educate the local communities about the negative impact of poisoning and best practices to reduce human-wildlife conflict. In 2023, 19,802 people were reached through these community events, bringing the total since the launch of the wind farm to over 100,000 community members. In addition to community awareness events, an additional 17 training events with rangers were held in 2023 on how to respond to wildlife poisoning events. Throughout 2023, there were six suspected wildlife poisoning events reported and quickly mitigated.

2 *Robust Bomas for Livestock Protection*

At night, livestock are usually kept inside a boma, an enclosure typically made of sticks, which can easily be penetrated by predators. The Biodiversity Committee is working with local non-profit organizations to build sturdier bomas that incorporate metal fencing. Through December 31, 2023, 67 new bomas have been built with 20 of those constructed in 2023. Predation incidents in these new bomas have decreased, with only two attacks reported inside the new bomas. In addition to building new bomas, the teams are working on improving / reinforcing existing bomas. During a recent three-month period, there were 383 incidents of livestock predation recorded—64% of those attacks occurred in grazing fields, 31% in traditional bomas and only 5% in reinforced bomas. None were recorded in newly built bomas.

Kipeto has also distributed 1,035 predator deterrent lights to the local communities to help reduce night-time predation events.

3 *Eyespots: Simple and Effective*

Predation incidents during the day are harder to mitigate given the need for livestock to roam and graze. One method being implemented in the local communities with assistance from local non-profit partners is an "eyespot" approach with cattle herds. This approach involves painting eyes on the backsides of cattle to deter predators. Ambush predators rely on the element of surprise, and studies[4, 5] have shown that cows painted with an additional set of eyes were less likely to be attacked.

An eyespot pilot started in July 2022 in a nearby area including a total of 1,070 cows. To authenticate the findings of this initial study, an alternate site of the Olare Orok village in the Masai Mara ecosystem was recently chosen by looking at villages with high cattle losses in grazing fields. In September 2023, five farmers from Olare Orok visited with the farmers included in the initial pilot to learn more about the eyespot project. All five farmers have consented to their cattle being used in this second study. Since the start of the initial pilot in July 2022, no painted cows had been attacked.

Above, from left: Market Outreach at Bisil Market © Fridah Kalekye; Safe and sound, Emily Osupato received a predator-proof enclosure for her goats from Nature Kenya, one of Kipeto Energy's conservation partners. © Sarah Waiswa; Eye spotting © Rebecca Ikachoi

Vulture Population Monitoring
A key component to evaluating the impact both onsite and offsite measures have on maintaining, and growing, the vulture and raptor populations around the Kipeto wind farm is understanding nesting locations and flight patterns. The Kipeto Biodiversity Committee has worked with local non-profit organizations to radio-tag 14 vultures and 24 raptors to track their movements and nesting locations to allow for additional data collection on the size of the local vulture population. From launch of operations through December 31, 2023, there have been 20 fledglings identified in the area. Fledglings in the local area are a great sign that enough resources are available and the local conditions in the region are conducive to growing vulture populations.

Community Benefits
In addition to focusing on the local vulture population, the Biodiversity Committee works with local non-profits on efforts to increase the livelihoods of local community members. Actions discussed above around decreasing predation events will not only reduce poisoning events of birds of prey but will also ensure the local communities maintain their herds, upon which their livelihoods largely depend.

Current community development projects also include training on beekeeping, poultry production, and bead working, to provide additional sources of income to local families, as well as support to schools with rainwater harvesting in order to increase water security.

As of December 31, 2023, 80 energy saving "jikos" (clay stoves that utilize less wood and hold more heat) have been distributed to the local community to help reduce logging activities that threaten vulture and raptor habitats. In addition, 2,080 tree seedlings have been planted in the area since the launch of the

Right: A White-backed Vulture spreads its wings while its parents work to keep up the nest by bringing new sticks pulled from nearby Acacia trees. © Bobby Neptune

Kipeto wind farm.

INTO THE FUTURE

The future of the Kenya Vulture Conservation Project includes continued financial support for the protection of endangered vultures and community outreach to benefit both people and biodiversity. The Biodiversity Committee continues to work with local non-profits on community education opportunities, obtaining a baseline of local vulture populations to ensure future population growth can be identified and using the onsite data collected to better manage the turbine shutdown process to reduce bird strikes. This work shows how alignment can be found between energy provision, conservation, and community. The Kenya Vulture Conservation Project is a replicable model that could be adapted and used to drive positive outcomes elsewhere. We look forward to sharing our knowledge with the wider market on how to create similar projects that can benefit conservation and communities.

ENDNOTES

1 Kipeto Wind Farm Enters into Innovative Loan Agreement to Fund Biodiversity— Kipeto Energy

2 IUCN Red List of Threatened Species

3 Griffon Vulture mortality at wind farms in southern Spain: Distribution of fatalities and active mitigation measures (csic.es)

4 Artificial eyespots on cattle reduce predation by large carnivores | Communications Biology (nature.com)

5 Painting Eyes on Cow Butts Could Save Cattle and Lion Lives | Smart News| Smithsonian Magazine

NOTICE

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