

**Monitoring and Conservation of Elephants (*Loxodonta africana*) in Volcanoes National Park,  
Rwanda**



**Final Report, June 2022**

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**Project End Date: June, 2022**

## **Abstract**

### **Conservation needs addressed**

Back in the 1960s and 70s, VNP was estimated to be the home to more thousands of elephants. The mountainous habitat was the perfect environment for the pachyderms, which inhabits the landscape for many centuries. With no real rivals or predators other than man, it seemed like the forests were a safe habitat for the creatures. But in the decades that followed demographic pressures and different governments measures related to the change in the land use that ended by converting part of the park into agricultural lands, impacted negatively their habitat and number. The situation was worsened by the war and an increasing number of guerrilla militias that took hold in the area from the 1990s.

Despite the best efforts of government conservation institutions, park rangers, and conservationist, some elephant conservation challenges went largely unchecked for many years. As a result, by 2020 it was estimated that just 120 elephants remained inside the park.

In a last ditch effort to try to save and protect the elephants of Volcanoes National Park, especially to better understand the pressure the population faces and to better protect VNP's elephants from the threats they encounter, this project was funded by the International Elephant Conservation. The funds were used to organize awareness activities among frontline communities on elephant conservation were conducted. Moreover, some park staff have benefited from trainings on elephant monitoring and conservation. Specially trained park rangers control the park looking for - and removing -dangerous snares designed to trap and kill an elephant, greatly reducing the threat of a long and agonizing death. Being on the front-line, these communities are also logically bearing most of the costs imposed by the protected areas and suffer the most from human-wildlife conflicts. This project is contributing to bring together the communities living around the VNP elephant range using a sensitization and behaviour change tool to bridge coexistence of elephant and people.

### **Project Goals and objectives**

Based in Rwanda's Volcanoes National Park, the continuation of this project will focus on elephant population monitoring. It aims to:

- Determine elephant movement and activity patterns in areas around Volcanoes National Park. Information on the movement and activity patterns will help us to design management plans aimed at promoting coexistence between the local communities and elephants.
- Understanding the modalities and causes of conflicts between communities and elephants and seek ways to mitigate such conflict;
- Promoting the importance of elephant conservation through conservation education and public awareness. This will enable us to spread knowledge about elephants and HEC in order to empower communities to initiate and manage conservation actions that

promote coexistence with elephants. This will also increase community tolerance towards elephants.

- Capacity building to increase the effectiveness of the Park's staff to manage elephant populations.

To meet the above objectives of the project, for a period of 6 months' project investigators worked with the park management officers, local leaders and communities around the park to collect existing monitoring data which enabled us to document the below findings. Different trainings –workshops were organized with park rangers and community members to build their capacity in monitoring elephants or manage cases of conflicts arising from their movements outside of the park. Park officials were even supported to partner with nearby communities to offer protective services, which helped to mitigate HEC. The ultimate objective of the project is to bring VNP's staff to be able to keep the community safe from elephants and the elephants safe from community potential retaliatory behaviours.

## **1. Activities and actions carried out**

### **Objective 1: Improve monitoring elephant populations within and around the Volcanoes National Park.**

An important conservation goal of this activity was to try and ensure that people and wildlife can coexist. This is especially important when it comes to the VNP elephants, whose large trans-boundary home ranges and long distance movements take them outside of protected areas. In the area adjacent to the VNP, one of the major challenges to coexistence is the damage of food crops by elephants. This threatens the livelihoods, food security and well-being of rural communities. This situation sometimes results in retaliatory practices and lack of support for current elephant conservation efforts.

### **Activity 1: Training-workshops for the Park rangers on elephant monitoring and modern data collection techniques.**

The organized trainings aimed to develop new techniques for field monitoring of elephants, and to train and equip Park rangers and local communities on appropriate human elephant conflict management approaches. The goal is to improve the current elephant monitoring systems and to strengthen park management capacity in mitigating human elephant.VNP rangers are at the frontline of conservation practice and the national park management, in the sense that they are directly involved in the practical implementation of interventions to protect the park and its fauna including elephants. Rangers deployed in VNP do still need necessary skills to perform well other park's specific law enforcement and wildlife monitoring activities. These include topics that were explored during the training namely elephant identification and monitoring techniques, their classification, their numbers estimation techniques,...



**Park rangers attending training**

**Activity2: Determine elephant movement and activity patterns in areas around Volcanoes National Park.**

From June 5<sup>th</sup> 2021, 8 Moultrie camera traps have been deployed at the eastern edge of the VNP to capture elephant visits to farmland. The cameras were set up in an area adjacent to the VNP. They were placed on the potential elephant trails on the National Park boundary to photograph elephants as they travelled in and out of neighbouring farmland or properties. Installation was done at 8 trapping points and relocation was scheduled every three weeks to different sites; to also allow downloading the photos and changing the batteries. Camera traps were set at 50cm above ground and were tied to trees or other support in order to increase the chance of recording all possible ground animals passing in the area.



**Setting and installing the Cameras at the edge of the Park.**

Though it was unfortunate that the cameras were not productive, elephant's visits in the areas were recorded and some pictures were taken. It was observed that in all cases, elephants visit farmlands as individually or rarely as two or three individuals. Due to that challenge, a fixed ground telescope was added to the cameras to remotely record elephant's movements in the target area. Also digital cameras were used by the project team and associated people to document movements of elephants outside of the park.





### VNP elephants exiting the park

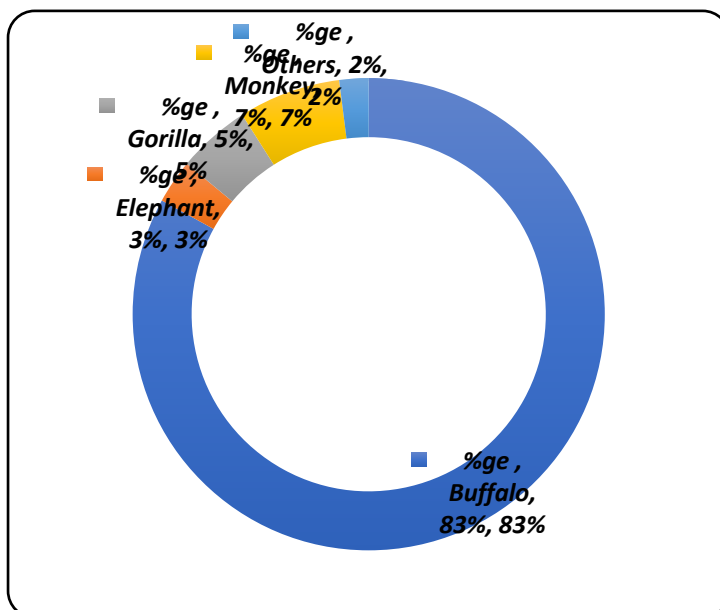
**Objective: Understand better the modalities and causes of conflicts between communities and elephants and seek ways to mitigate such conflict.**

Around VNP, Human-elephant conflict is a major challenge for supporting the survival and persistence of elephants because these are places where the development and well-being of human communities sharing space with these mega-herbivores is also important. As farmers transformed the landscape, pushing human and elephant populations to live in ever closer proximity, the likelihood of conflict increases with often fatal results.

### Role of elephant among animal problems around Volcanoes National Park

For people and elephants to thrive in the long-term, it's important to find ways to mitigate the impact of the animal on people's lives and livelihoods, and vice versa. To find effective solutions, we need to understand why elephants eat crops rather than fodder from the bush and how they learn about crops as a source of food and understand the importance of human elephant's conflicts in VNP in comparison to other animal species inhabiting the same park.

#### a- Animal species

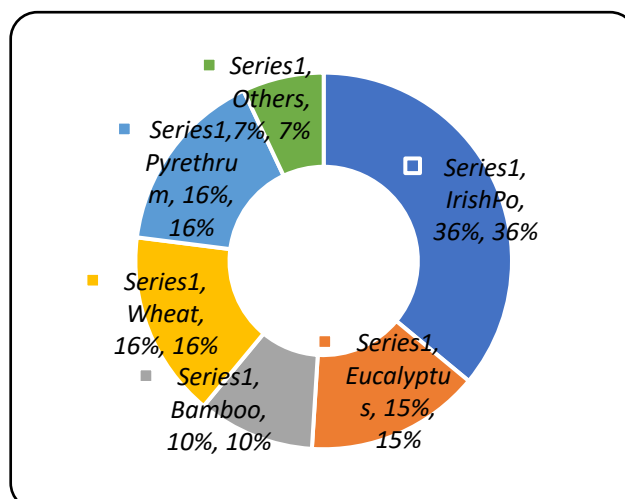


Animal species that are involved in crop raiding include mainly buffalos (83%) followed by Golden monkeys (7%), Mountain Gorillas (5%) and elephants (3%). Others including duikers and jackals occupy only 2% (VNP Report, 2020).

**Source:** VNP- Crop raiding data (2016-2020), May 2021

### b- Types of damaged crops

Types of crops that are damaged by animals mainly include Irish potatoes (36%), pyrethrum & wheat (16% each), Eucalyptus (15%) and bamboo (10%). Other damages representing 7% include peas, maize, beehives, and human injuries. **Source:** VNP - Crop raiding data (2016- 2020), May 2022



### c- Quantities of damages

In order to get information related to the quantity of damages, we met and discussed with agronomists in charge of farming activities from 4 administrative sectors in Musanze district. The discussion was based on the average investment and yield of Irish potatoes at 20 acres (Igikebo), especially when the farmer operates in normal season (without crop-raiding) and/ or in abnormal season (with crop-raiding). In both situations the yield would be calculated on the current price, and then make a cost- benefit balance. The following table shows the results:

**Table 1: Comparison-Irish Potatoes Yield with/ without crop raiding around VNP**

Sector	Investment on 20 Acres (Irish Potatoes) in RwF	Yield in Tones& Benefit during Normal Season (Without Crop-raiding)	Yield in Tones& Benefit during Abnormal Season (With Crop-raiding)	The balance/ Loss
Nyange	RwF 400,000	3 Tones*200= 600,000	2.5 Tones*200= 500,000	RwF 100,000
Kinigi	RwF 500,000	3.5 Tones*200= 700,000	2 Tones*200= 400,000	RwF 300,000
Shingiro	RwF 500,000	4 Tones*200= 800,000	3 Tones*200= 600,000	RwF 200,000
Gataraga	RwF 500,000	3.5 Tones*200= 700,000	3 Tones*200= 600,000	RwF 100,000

**Source:** Survey, May 2021

According to table 1, the effect of crop raiding by problem animals around VNP differs from one sector to another, as per the discussion below:

- The quantity of raided/ damaged crops also differs from one sector to another. For example, in Nyange and Gataraga sector animals could deduct 0.5 Tons of yield respectively; Kinigi (1.5 Tone) and Shingiro (1 Tone).
- The return on investment (RoI) was evaluated in an average loss of RwF100,000 (Nyange&Gataraga), RwF 200,000 (Shingiro) and RwF300,000 (Kinigi). Different factors have made Kinigi sector to have the highest loss. They include the physical nature of the terrain (flat landscape), high concentration diverse wild animals, and the hard edge or status of park- community interface and transboundary issues.



### **Damages of elephants and agriculture pressure to the Park**

It is important to note that Growing evidence suggests that crop raiding peaks near harvest time, potentially provoking retaliatory behaviours in response to high crop losses that threaten the survival of farming households.

### **HEC Prevention Strategies around VNP**

Much of the effort aimed at addressing conflict has focused on prevention by keeping humans and elephants separated . Physical exclusion methods such as stone fence and trenches are used around VNP to deter not only elephants but also other animaux species from entering farmland and human settlements. However, substantial costs of regular maintenance confer challenges to the management of the park. In addition ; compensation of losses constitutes another used strategy to provide financial compensation to those affected. Requesting compensation involves reporting the property damage and/or loss to park authority and other authorized local bodies; followed by a visual assessment of damage by those authorities.





**Stone fence around Volcanoes National Park**

**Determination of age-sex structure and behaviour of crop-raider elephants.**

The demography of crop-raiding elephants around VNP, basing on the collected and verified cases shows that the maximum group size was. 4 crop-raiding events involved mixed groups4 (adult females and bulls) whereas 7 of the incidents involved lone bulls (adult males or females).



**Lone elephant bull outside of the Volcanoes National Park**

**Objective 3: Promote the importance of elephant conservation to stakeholders with particular respect to ecological function and ecotourism potential.**

**Activity 1: Conduct Community education and awareness in sectors around the VNP.**

In collaboration with the community conservation department of the Volcanoes National Park (VNP); awareness meetings and the community work (Umuganda) were organized in two sectors (Nyange and Kinigi) of Musanze district for maintenance activities of the physical deterrents to human-wildlife conflicts i.e. stone wall and trench. Participation in these two activities involved members of community based organizations (CBOs), non-CBOs and leaders of local administration i.e. village leaders, cell and sector executive secretary and agronomists. At every occasion after Umuganda, it was a good opportunity to meet and talk about

elephants' conservation and human - elephant conflicts around VNP in particular. Specifically, the following questions guided the discussion on elephants:

- ✓ How often (frequencies) do animals in general and elephants in particular, get out of the park?
- ✓ How far (distance made) do animals and Elephants penetrate into community farmlands?
- ✓ What does attract/ influence these outranging animals?
- ✓ What do you think can serve short/ long term solutions of human- wildlife conflicts near VNP?
- ✓ Who (among stakeholders) can implement these solutions?

According to local communities (participants), buffalos get out of the park almost every night, while elephants come rarely (once a quarter), in both Kinigi and Nyange sectors around the VNP. However, the elephants' damages are much more disastrous than any other animals, especially when the meet trees (Eucalyptus). Elephants can penetrate down to 2 km- distance outside the park; where targeted crops (Irish potatoes, Eucalyptus, pyrethrum) are located.

They suggested that all concerned stakeholders (RDB, NGOs, CBOs, Local administration, Farmers) should combine efforts towards short and long term solutions. Short term solution will involve strengthening the existing physical deterrents (PD) i.e. stone wall and trench; thorny- trees plantation around the PD, and providing CBOs with materials for the maintenance.



**Awareness campaigns using the participative approach.**

To conclude, the stone wall erected around the Volcanoes National Park contributes to solve the problems of poaching and human-wildlife conflicts in the volcanic area. However, it was noted that the construction of stone wall did not prevent animal from escaping the park. Through the implementation of this project, though only 4 meeting –workshops around this community work were organized; the park gains the support of local community cooperatives to maintain the wall whenever there is a need.



## **Activity 2: Organize awareness raising activities as part of inter-village exchange:**

The word Umuganda can be translated as ‘coming together in common purpose to achieve an outcome’. In traditional Rwandan culture, members of the community would call upon their family, friends and neighbours to help them complete a difficult task. Using the community work known as Umuganda, at every occasion after Umuganda, it was a good opportunity to sit and discuss about the following matters as related to HWC caused by big mammals in general, and elephants in particular.



Over 300 community members were touched by this activity, supporting the park with its sensitisation activities. It was recommended that all CBOs should keep their endeavours to monitor outranging animals, always report to the park management; while also undertaking maintenance activities for the established physical deterrents along the park.

## **Activity 3: Form elephant conservation eco-clubs in community cooperative and Primary Schools.**

### **Conservation education in primary schools’ environmental club**

One of the VNP management strategies to increase the conservation awareness in its surroundings is to work hands in hands with different groups including local schools clubs through the Community partnership program. It is in the same perspectives 4 sessions were carried out in Kabara primary school (Nyange sector), and Nyabitsinde Primary school (Kinigi sector). This exercise aimed at assessing the general knowledge of environmental clubs’ members on VNP, while also raising a concern on elephants’ conservation.

Specifically, participants shared background information about the VNP fauna and flora, ecosystem services and occurrence of human wildlife conflicts and related problem animal

including elephants. Particularly; the forest elephant's background information was also shared including morphology, psychological behaviour, and ecological contribution in park habitat. Furthermore, the potential elephants' threats in general and particularly in greater virunga landscape (GVL) were discussed. It was stipulated that African forest elephant conservation status by IUCN list is an endangered species, while major threats include habitat loss, Illegal wildlife trade i.e. poaching for bush meat and ivory.

When the kids were asked about what can be done to conserve elephants, reduce their threats, control their caused problems, and their roles in the park conservation of VNP and elephants in particular, they expressed their commitment in park conservation given all ecosystem services obtained from VNP including educational activities and livelihoods. They promised to extend the message to their parents and fellows in their respective villages. Importantly, children were informed to elaborate some basic projects as per their environmental clubs' plan. Such projects can be supported through the existing initiatives i.e. tourism revenue sharing or other park partners' opportunities. This will serve not only as park conservation incentives for them - but also play an important role to connect kids with nature at early age and it also indirectly contributes to their school performance at the real extent.



#### **Awareness campaigns using the participative approach in**

We were delighted to note that this school education programme focusing on environmental clubs touched approximately 300 school children who we engaged in educational activities.

#### **Activity 4: Design resource materials for use in elephant conservation community outreach.**

The objective of these activities was to engage the local communities about the importance of elephant conservation in and around volcanoes national park. The team members engaged the

local radio stations to communicate about elephant's conservation around volcanoes National Park. During the radio talk shows, focus was put on the ecological importance of elephants and the need to conserve the elephants. At the end of each of the four emissions that were organized; attentive audience were given opportunity to ask different questions that were answered accordingly.

### **Project impact evaluation**

Though the beginning of the implementation of this project was impacted by the COVID-19 mitigation measures, it has recorded positive outcomes especially after the month of July 2021. Therefore, the involvement of some park's managers and nearly 50 rangers in the implementation of this project was effective especially in undertaking setting camera traps around the park and raising awareness of community and youth in schools around the park made possible the continuation of elephants monitoring, especially their movements. The project, through its component of sensitizing community members and youth in schools touched more than 300 people and this is expected to change positively attitudes and behaviour of people living around the VNP which will in turn allow the coexistence of elephants and people. Thanks to International Elephant Foundation, this project contributed to improving the protection and conservation of a population of around one hundred savannah elephants ranging in the Volcanoes National Park.

### **Conclusion**

This project is improved the understanding of the elephant's behaviour at the park – local community interface, as it allowed to document their distribution and relative abundance while ranging at the vicinity of the park. Students in schools and general community members especially the vulnerable populations of HEC formed the main audience of the awareness raising part of this project. As part of a successful story, VNP Community wardens were involved in the implementation of the project and they reviewed and engaged the audience in discussions/question and answer sessions to see how much they have learnt as well as how the drama can be further improved. The VNP community conservations officers believe that: “The use of technology in monitoring elephant population outside protected areas will provide insights on the existing management gaps and provide new opportunities for better managing them”. It is undoubted that results of this project will be used to inform management decisions on the complex interplay VNP elephants to mitigate the conflicts while protecting the elephants of the park with the involvement of local communities hence a peaceful coexistence.

## Budget Execution

No	Activity	Unit costs	Expenses
1.	Park Field staff Workshops/trainings on monitoring and data collection techniques	4 trainings x 20 staff @ 25 \$ each	\$ 2000
2.	Purchase energizer Ultimate lithium batteries for Camera traps	27 *12 Energizer Ultimate LITHIUM batteries (\$ 20.95 per 12 cells)	\$ 517
3.	Allowance for field support team - deployment and pick up of camera traps	For 2 rangers and 1 porter @ \$12 * 40 days	\$ 1461
4.	Transport facility for investigators in mobilization and camera traps installation and data collection	Public transport and motorcycle mileage at the standard rate of \$ 0.80 km for 30 km per in 40 days	\$ 927
5.	Community education and Awareness - raising: workshop.	4 workshops X 30 individuals @ 25 \$ each	\$ 3000
6.	Resource materials and radio talks to be used in conservation community outreach	Airing 3 radio talks on Conservation @ \$ 15 and hiring venue for the workshops of community awareness.	\$ 1014
7.	Investigators per diem	40 working days X \$ 20 each	\$ 800
8	Communication and reporting	\$ 250	\$ 250
	Total		\$ 9 969