

Final Evaluation Report

Your Details	
Full Name	Daniel Niyonsaba
Project Title	Assessment of habitat quality in areas formerly occupied by elephants in Nyungwe National Park, Rwanda: a prerequisite for elephant re-introduction planning.
Application ID	29575-2
Grant Amount	£6,000
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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
<p>To identify Plants species composition (species richness) and abundance in areas formerly occupied by elephants in Nyungwe National Park.</p>				<p>The outcome from this research project demonstrated that species composition in study area is 115 plant species - 25 species are dominants at the rate of 87.6%. Abundant species include:</p> <p><i>Syzygium guineense,</i> <i>Macaranga kilimandscharica,</i> <i>Alchornea hirtella,</i> <i>Chassalia subochreatea,</i> <i>Carapa grandiflora,</i> <i>Galiniera coffeoides,</i> <i>Psychotria mahoni,</i> <i>Podocarpus latifolius,</i> <i>Memecylon walikalense,</i> <i>Rytygynia bugoyense,</i> <i>Chionantus africana,</i> <i>Allophylus chaunostachys,</i> <i>Maesa lanceolata,</i> <i>Cassipourea ruwenzoriensis,</i> <i>Neoboutonia macrocalyx</i> <i>Maytenus acuminata</i> <i>Polyscias fulva</i> <i>Strombosia scheffleri</i> <i>Hagenia abyssinica</i> <i>Galiniera coffeoides</i> <i>Ochuna afzeri</i> <i>Dombeya goetzenni</i> <i>Anthocleista grandiflora</i> <i>Nuxia congesta</i> <i>Rapanea melanophloeos</i></p>

<p>To document Plants species distribution in areas formerly occupied by elephants in Nyungwe National Park.</p>			<p>During the documentation of plant species distribution, the results indicated that in areas formerly occupied by elephants, plants were distributed at density of 689 trees/ha, where saplings occupy 32%, seedlings 21% ,trees with DBH (Diameter at Breast Height) from 10cm to 49cm 47% while big trees with DBH above 50cm occupy 9%.</p> <p>The research results indicated that the herbs are dominated by <i>Mimulopsis</i> (45%), <i>Sericostachys scandens</i> (25%), and <i>Dryopteris</i> (20%).</p> <p>The large number of young trees in Nyungwe National Park is an important indicator of the sustainability of forest which would be a suitable habitat and forage place for elephants once are re-introduced in Nyungwe National Park.</p>
<p>To document landform and land cover.</p>			<p>The results from this research indicated that the landform in study area is characterised by valleys and modest hills where highest elevation recorded is 2689 m while the lowest is 1936 m above sea level and 50% of study site has water sources.</p> <p>Landscape cover in areas formerly occupied by elephants includes 34% tall open forest, 24% clearings, 17% tall, closed forest, 12% short open forest, and 11% swamp while 2% is short, closed forest at a density of 689 trees /1ha.</p>

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

The unforeseen difficulties encountered during assessment of habitat quality in areas formerly occupied by elephants in Nyungwe National Park are linked to the Covid-19 pandemic. These unforeseen difficulties include the delay of implementation of project because lockdown was implemented here in Rwanda when I was preparing to start my filed activities.

Working under restrictions and guidelines related to the Covid-19 pandemic. To avoid the spread and transmission of Covid-19 to humans or animals, unusual practices and safety measures were adopted to manage Covid-19 pandemic such as social distancing, washing hands often, and wearing masks and use of disinfectants products.

In addition to this, some of team members who were not park staff were not allowed to participate in research activities because presence of outside world was prohibited to ensure the safety of animals and park staff who were not permitted to interact with other members from surrounding communities to ensure safety and spread of Covid-19 among park staff. To fill the gap of non-park staff team members, Nyungwe National Park management availed other experienced staff so that the research activities may be carried out as they are planned and minimise the possible spread of Covid-19 to park staff and wildlife animals.

3. Briefly describe the three most important outcomes of your project.

During this research project, I managed to document habitat quality in areas formerly occupied by elephants in Nyungwe National Park where different habitat types and land cover were identified. 34% of the landscape is covered by tall open forest, 24% clearings, 17% tall, closed forest, 12% short open forest, 11% swamp and 2% short closed forest.

The outcome from this research project demonstrated that species composition in study area is 113 plant species at a density of 689 trees/ha. 25 plant species are abundant such as *Syzygium guineens*, *Macaranga kilimandscharica*, *Alchornea hirtella*, *Chassalia subochreatea*, *Carapa grandiflora*, *Galiniera coffeoides*, *Psychotria mahoni*, *Rapanea melanophloeos*, *Podocarpus latifolius*, *Memecylon walikalense*, *Rytygynia bugoyense*, *Chionantus Africana*, *Allophylus chaunostachys*, *Maesa lanceolata*, *Cassipourea ruwenzoriensis*, *Neoboutonia macrocalyx*, *Maytenus acuminata*, and *Polyscias fulva*.

Landform in study area is characterised by valleys and modest hills where highest elevation recorded is 2689 m while the lowest is 1936 m above sea level and 50% of study sites have water bodies.

Habitat type, forage availability, water, land cover, and topographic quality of a landscape are very important factors that guide an elephant's decision to reject or select a particular habitat (Ananda Kumar, Mudappa, & Shankar). We hope that the findings of this project will help Nyungwe National Park managers to plan and implement elephant re-introduction in Nyungwe National Park once they may need to re-introduce them while allowing them to prepare and put in place different equipment and avail all resources that could be needed for the implementation of different decisions and plans related to reintroduction of elephants and conserving Nyungwe's biodiversity and their habitats.

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

The involvement of local community in this research project was at the minimal level due to the implementation of regulations established by the Ministry of health in Rwanda and Rwanda Development Board / Tourism and Conservation Department, related to research and tourism activities in national parks to fight Covid-19 pandemic. The presence of non-park staff within all national parks was prohibited.

Local community involved in these research activities included four porters who usually work with park and a driver. They were authorised by the park because they live in the vicinity of the park and were required to remain in the park with the team until research activities are over. A driver also was required to disinfect his vehicle before and after of daily activities and remain close to the park. His interaction with external world was prohibited until the end of field activities.

These community members benefited from getting allowances that given to them for their efforts and time during this research project. Their awareness about importance of biodiversity was raised as they were able to know why we are such research activities are being carried out.

5. Are there any plans to continue this work?

Yes, there is a plan to continue this work because after gathering information on the reasons which caused extinction of elephants in 1st project , and assessing habitat quality in areas formerly occupied by elephants in Nyungwe National Park in the 2nd project, where 1st and 2nd projects funded by the Rufford Foundation, it is important to carry out research about resources that could be shared and used between humans and elephants around NNP for mapping resources distribution and forecast conflict zones for development of sustainable solutions for managing human-elephant conflicts.

This will be very important because human-elephant conflict should be a threat to biodiversity conservation once elephants are re-introduced, and the management of such conflict would be a primary goal for elephant conservation in Nyungwe National Park.

Therefore there is need of continuing this work for identification of resources that could be shared and used between humans and elephants around Nyungwe National Park for mapping resources distribution and forecast conflict zones for development of sustainable solutions for managing human-elephant conflicts in Nyungwe National Park.

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

The results will be shared through different means which include public workshops, seminars, public lecturers, and some education materials like booklets, brochure and report to RDB (Rwanda Development Board), Tourism and Conservation Department which is in charge of tourism and conservation activities in Rwanda's national parks.

7. Timescale: Over what period was the grant used? How does this compare to the anticipated or actual length of the project?

According to original plan, research activities were planned to start in March 2020, but due to lockdown measures that were implemented in Rwanda in early March for dealing with Covid-19 pandemic, I started my research activities in June 2020. Currently, all planned activities have been completed according to adjusted plan that started in June 2020.

8. Budget: Provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Research permit	100	15	-75	
Field Equipment cost	760	680	-80	During this research, we hired field equipment which include Tents, cooking wares, Digital camera, Batteries, GPS
Research design	300	293	-7	GIS expert was hired for helping in designing transects using Arc GSI software as well as producing maps used during this research.
Feeding allowance	740	740		This amount was spent to feeding allowance during data collection into the forest.
Transport to the field	2100	2100		This amount was spent on transport for field activities in different locations.
Field assistants	1200	400		This amount was paid to field assistants.
Porters	400	400		Due to topographic conditions and forest structure, we hired extra field staff for facilitating research activities. This has resulted in increase of budge which covered by the 100£ that saved from Data Analysis. The cost saved from publication was used to cover this extra cost spent on Allowances for rangers which is higher than it was planned.
Data analysis	150	100	-50	The amount of 50£ that saved from Data analysis used to cover the extra cost for extra assistant.
Research reporting	50		-50	In kind contribution

Publication	200		-200	Publication will be done after reporting period. Due to large area covered during data collection among local community, we have used accommodation for facilitating research activities in which we spent the 160£, the amount saved from Publication.
TOTAL	6000	4728	-1272	Note: 1GBP = 1,125 Rwandan Franc
Additional costs		300		Due to extra cost on budgeted amount, the saved amount of 212 £ from some items was used to cover the cost of extra assistant for data entry.

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

The funds from Rufford Foundation enabled me to implement two projects which will be important in planning and reintroduction of elephants in Nyungwe National Park. At this level, the next step is to identify resources that could be shared and used between humans and elephants around Nyungwe National Park for mapping resources distribution and forecast conflict zones for development of sustainable solutions that will be used for managing human-elephant conflicts when elephants will be re-introduced in Nyungwe National Park.

10. 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?

Yes, I used The Rufford Foundation logo in all materials produced in relation to this project and the Foundation received publicities during the course of my work.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Team members

NIYONSABA Daniel: researcher

During my research activities, I worked with people which include **NGAYABAHIGA Ferdinand** senior field staff from WCS (Wildlife Conservation Activities) who has an experience of 30 years in botany field, **Ndiramiye Gratien** who is also experienced botanist, he also worked with WCS for more than 20 years, now is freelancer research assistant as well as **Semana Anastase** and **Kabanguka Alexandre** from Nyungwe National Park field staff. **Tuyambaze Chanceline**, a young woman scientist and graduate from National University of Rwanda contribute a lot in Data entry They

were my assistants and their experience, knowledge and skills in Botany contributed a lot in achievements of my research activities.

Ntahomvukiye Aaron and **Maniraruta Emmanuel** were our porters while **Hagabimana Felicien** and **Nshimiyimana Anastase** were our cook.

As our study sites were deep into the forest, Nyungwe National Park management availed to me armed people for protecting and ensure our safety during data collection for this research project. As our research activities were carried out on four different sites, two armed rangers used to accompany our team on each site. Those rangers include: **Ndagijimana Xavier, Harerimana Gaspard, Bizimungu Pascal, Twizerimana Anne Marie, Baranyeretse Eliezer** and **Kabayiza Assouman**.

All team members were active, and everyone's role was valuable during my research activities.

During my research activities I worked closely with **NDIKUBWIMANA Innocent** research and monitoring and **TURIKUNKIKO Ezekiel** Law enforcement wardens from Nyungwe National Park to ensure that all activities are being done as were planned. They also used to visit me on the field during data collection and coordinate the rotation of armed rangers who were in charge of our safety.

Professor Beth Kaplin, Nshimiyimana Francois Xavier project supervisor, were consulted during this research to ensure that all efforts which we are using are generating useful outcomes for sustainable conservation of elephants.

12. Any other comments?

We appreciated so much an important role played by the Rufford Foundation through funding this project because results from this project will help Nyungwe National Park managers to plan and implement all decisions related to re-introduction of elephants in Nyungwe National Park and conserving Nyungwe's biodiversity and their habitats.

The further support for this project is needed for other prerequisites and important studies for elephant re-introduction. This is very important because elephants are key stone species due to their role in seed dispersal, germination and maintaining food web- link and the forest ecosystem.

Reintroduction of elephants in Nyungwe, can also contribute a lot in strengthening their conservation efforts, increasing their population as well as increasing the profile of Nyungwe's biodiversity like before. We hope, The Rufford Foundation efforts in biodiversity conservation will continue bringing about positive changes in saving threatened species for better future of people and planet.