

## The Rufford Foundation Final Report

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Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to [jane@rufford.org](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
<b>Your name</b>	Jeannette BATAMULIZA
<b>Project title</b>	Influence of food availability on the distribution of the Eastern Chimpanzee ( <i>Pan troglodytes schweinfurthii</i> ) in Nyungwe Forest National Park (NNP), Rwanda.
<b>RSG reference</b>	20018-1
<b>Reporting period</b>	September 2016- January 2018
<b>Amount of grant</b>	£5000
<b>Your email address</b>	jealiza90@gmail.com
<b>Date of this report</b>	23 <sup>rd</sup> December 2018

**1. Please 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
Assess the influence of food availability on the distribution of the Eastern chimpanzee in Nyungwe National Park				<p>This objective has been assessed by using scan sampling technique. In many cases, chimpanzees were recorded in <i>Ficus</i> sp. (35.67%) followed by <i>Chrysophyllum rwandensis</i> (32.16%). Chimpanzees were also recorded in the other different trees species including <i>Syzygium guinneense</i>, <i>Macaranga kilimandscharika</i>, <i>Chrysophyllum gorungosanum</i>, <i>Carapa grandiflora</i>, <i>Parinari excelsa</i> and others but at the lowest frequency. The difference in frequency was due to season in which the data have been collected which had the implication on the fruit availability/ quantity. It has been recorded that many plant species that serve as chimpanzee diet were in flowering phase while few of them including <i>Ficus</i> sp. with ripen fruits and that is why chimpanzees were recorded several times in this plant species than others. According to the research findings, we saw that the dominant food sources were <i>Salacia erecta</i> which a woody climber mostly in <i>Chrysophyllum rwandensis</i> and <i>Ficus</i> sp. with respective fruit abundance of 75-100% and 50-75%.</p>
Determine distribution and abundance of the top plant species constituting chimpanzee diet				<p>The distribution and abundance of the top plant species that serve as chimpanzee food source were mostly recorded in the elevation ranging between 2351-2400 m (60.22%) followed by 2301-2350 m (30.11%). The table with showing the top plant species that serve as chimpanzee food source will be annexed on this report.</p>

To update the list of plant species eaten by species			During the data collection period, we recorded 13 plant species where <i>Ficus</i> sp. (35.67%), <i>Chrysophyllum rwandensis</i> (32.16%), <i>Macaranga kilimandscharika</i> (16.37%) and <i>Parinari excelsa</i> (7.02%) were the most preferred compared to the other plant species. The generated list of plant species eaten by chimpanzee will be annexed on this report.
Propose conservation measures of plant species that serve as main chimpanzee food resources			The list of plant species that serve as main chimpanzee diet was generated together with these species distribution and abundance. Also some conservation measures were proposed including plant species restoration taking into consideration forest edge, elevational gradient and climate / drought resistance. We are planning to achieve this objective during the second round of this project.

**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

The project was not conducted in the way it was planned and we met the following unforeseen difficulties:

- Before, the project was supposed to be carried out in Cyamudongo forest fragment of Nyungwe National Park but later, due to the request from Rwanda Development Board (RDB) which is an entity in charge of protected areas conservation and management in Rwanda, they kindly asked us if we can support Gisovu site chimpanzees conservation by shifting our research to this site (which another site of NNP with semi habituated chimpanzees population). We happily agreed to shift our research and it was the honour for us to be the first researchers on chimpanzees' diet and distribution in this site.
- The fieldwork at the side was not easy and the chimpanzee population which is located in this site is semi habituated which made the work very hard because it was not very easy to conduct a scan sampling due to the fact that when chimpanzees observed researchers they ran away. This is because neither tourism nor research is being significantly conducted in this site and took more than the expected time. Despite these challenges, we stayed focused and adaptive. We adopted a mechanism of starting our field work at 5:45 - 6:00 am so that we can have enough time to follow chimpanzees until 5:00 -6:00 pm.

- The fieldwork for was carried out in remote areas with bad trails sometimes not still clear enough that it could take longer than it was expected especially when we were conducting scan sampling. To tackle this challenge, we were with trackers and field assistants and we have machetes and big sticks to clear our way then move forward so that we couldn't lose our lovely chimpanzee group!

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

The most important outcomes of our project are:

- ❖ *Relationship between chimpanzees distribution with their food availability:* Based on our research findings, we found that there was a positive correlation between chimpanzees and their food availability and distribution.

This is has been justified by the fact that chimpanzees were mostly recorded where the trees species with ripen fruits that serve as chimpanzees diet were distributed.

- ❖ *Distribution and abundance of the top plant species that serve as chimpanzee diet:* Before we started the field work, we asked trackers the top plant species that chimpanzees used to feed on. The trackers gave us only eight plant species but at the end we recorded 13 plant species means more five plant species were added to the list of the top plant species that serve as chimpanzee diet at this site. We found that these species are distributed based on the elevational gradient.
- ❖ *Tentative conservation measures for the plant that serve as chimpanzee's food:* The phenology survey helped us to assess these plant species seasonal variations in terms of food availability and quantity. Our fieldwork was conducted during dry season where many of the plant species that serve as chimpanzees food were in flowering period, developing new leaves while few of them had ripen fruits. We realised that some plant species are not drought resistant. Among conservation measures proposed, we thought about these drought resistant species restoration so that even during dry season chimpanzees can still get enough food and this will ease researches and tourism activities which is close to be introduced in this side.

### **4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).**

The benefit and involvement of local communities from this project consist of three aspects which are listed below by their order of importance:

**Advocacy:** During our field work, we used to see chimpanzees went out of the park and raided some crops of surrounding farmers and this creates some human and wildlife conflicts. Due to tourism is not yet introduced at this site due to some constraints including the road which very bad in addition to chimpanzee population of this site which is still being habituated, communities can't get any compensation

due to there is not any financial income generation activity at this site so that at least the revenue sharing can compensate the damaged properties. After hearing from these communities, we promised them to advocate for them so that Rwanda Development Board can approach them and seek for some possible solutions about this question.

**Small financial income generation:** During our project implementation, we hired two field assistants born and raised around this site and another one who is a recent graduate in conservation biology at the University of Rwanda who was born and raised around the western side of the park. The hired team was extremely happy and excited to be part of the project implementation where they got some financial income in addition to the field experience/ skills acquired. They really appreciated how this projected contributed directly to their livelihoods and career at the same time and they suggested that it can be awesome if more and possibly big projects can be carried out in this site. This will increase the well-being of surrounding communities and raise awareness of chimpanzees' conservation in this site.

**Raise the communities' level of understanding about chimpanzees' importance:** During the weekend we used to move around the site and have informal meeting with different local communities and introduced to them our research project. We usually asked them if they know any importance of chimpanzees but the majority were saying that they don't see any importance of chimpanzees at Gisovu site. They said that they know other sites with chimpanzees like Cyamudongo and Mayebe (these are the two NNP sites with habituated chimpanzee groups) where tourists are coming and surrounding communities are benefiting from tourism (being guides), selling their handcraft products and other financial or development support from tourism revenues. They said that Gisovu site doesn't receive tourists and this is why they don't see any benefit from the chimpanzees of this site. After hearing from them, we explained to them that Gisovu tourism management plan is being developed and chimpanzee group is being habituated and there is a hope that Gisovu tourism is close to be started too. Apart of this economic importance of chimpanzees, we explained to them that chimpanzees have also a tarmac ecological importance like seed dispersion and ecosystem functioning which (this last) provides different ecosystem goods and services for human wellbeing. The communities felt interested to know about how chimpanzees have such amazing importance and they suggested that we can have some talks with different community groups and the surrounding schools for sustainable and long term chimpanzees' conservation of Gisovu site. We felt excited and proud to see how within a short time we had at least we changed the mind set of some communities and we are planning to go back to this site and raise the awareness of these surrounding communities who are thirsty to know much more about these amazing and incredible creatures (chimpanzees).

##### **5. Are there any plans to continue this work?**

Yes, I would like to continue with this work through three channels:

➤ **Gisovu site species restoration and job creation:**

During our data collection, we were in a dry season and few of plant species that serve as chimpanzees' food source were ripen while others were developing new leaves, flowers or young fruits.

This was a challenge because in additional to the semi habituation of this chimpanzee group, chimpanzees were usually moving looking for food. We realised that chimpanzees face food scarcity during this period and we suggested that planting more drought resistant plant species which serve as chimpanzees diet can be a long term solution not only for human-wildlife conflict resolution but also it will promote the tourism once started at this site. This activity will go together with the removal of exotic plant species in this site where a significant number of local communities will get involved.

➤ **Education:**

Education will be focusing about NNP importance and conservation but basically focusing on Gisovu site. The targeted beneficiaries will be local communities and leaders, primary and secondary schools students and teachers, cooperatives and religious leaders. This will raise the awareness of biodiversity conservation around Gisovu site towards sustainable development of our country.

➤ **Comparative study of the relationship between chimpanzee distribution and their food availability in the two sites of NNP namely Gisovu and Mayebe:**

Since we have the data collected at Gisovu site and data from various researchers from University of Australia who conducted similar researches at Mayebe site which has habituated chimpanzees. Our intention is to see how these two chimpanzees groups are distributed and if their food availability has an influence on their distribution. I will also assess food composition difference (vegetation type, canopy type, forest cover and other factors) on both side and see if elevational gradient may have an impact.

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

The results of this study will be shared through six channels:

- 1 Presentations during the annual research symposium organized by Rwanda Development Board in collaboration with the University of Rwanda.
- 2 National and international conferences on biodiversity conservation where my research findings will be shared through oral presentation or poster display.
- 3 My research findings will also be shared during Kwita Izina (Gorilla naming Day ceremony)/ Conversation on Conservation. Both options (oral and poster display) will be used.
- 4 Through monthly research seminar organized by the University of Rwanda through the Center of Excellence in Biodiversity and Natural Resources Management where the findings will be shared to the students, lecturers and other researchers.
- 5 Scientific paper which will be submitted in a peer reviewed journal.



- 6 The research findings will be shared as a case study where I will be delivering talks to different community groups and students.

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

Overall	Activity	Anticipated time	Real time	Comments
<b>Data collection</b>		<b>2 months</b>	<b>5 months</b>	<b>Delay of 3 months</b>
	-Research permit acquisition from Rwanda Development Board (RDB) -Field reconnaissance visit -Contact of different stakeholders working in NNP	1 month	3 months	We faced a delay of 2 months due to the fact that we were kindly asked by RDB to shift our project to the other site whose chimpanzees' related data are still quite poor. So, it required us to extend our field reconnaissance time. The other constraint was the time it took us to get the research permits compared to the expected time.
	-Chimpanzees distribution data -Chimpanzees preferred plants species	2 months	3 months	One month of delay due to this chimpanzee population is semi habituated in addition to the food scarcity which makes chimpanzees to spend a lot of time moving either looking for food or escaping our presence. At the first month we didn't have enough data and that is why our field work was extended to three months.
<b>Data entry, analysis and report compilation</b>		<b>4 months</b>	<b>6 months</b>	<b>2 months of delay</b>
	Data entry and clearing	1 month	1 month	As expected
	Data analysis	1 month	2 months	Delay of 1 month
	Report compilation	2 months	3 months	Because of the delay we faced in the first steps of the project implementation, the reporting period conflicted with other assignments within my institution which made the reporting period to delay a bit.

**8. Budget: Please 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.**

Item	Budgeted Amount	Actual Amount	Difference	Comments
Research design	800	800	0	This was in-kind contribution
Research permits	30	90	60	This was in-kind contribution. The research permits were paid on a monthly basis while the field work took 3 months.
Field reconnaissance	400	400	0	In-kind support
Chimpanzees distribution data collection	1500	2000	500	We extended our field work to intensive five days more to get enough data
Chimpanzee diet data	1500	1800	300	we extended our field work to three days more to get enough data
Transport for field work	3000	3000	0	We didn't spend the whole planned budget because sometimes we camped at the site.
Data analysis	1000	1000	0	This was in-kind support
<b>Total</b>	<b>8,230</b>	<b>9090</b>	<b>860</b>	We had to add extra £ 860 to finalize our project and we were very happy to cover this extra budget.
<b>1£=1027.877302 RwF</b> ( <a href="https://www.bnr.rw/index.php?id=23">https://www.bnr.rw/index.php?id=23</a> visited January 23 <sup>rd</sup> 2018)				

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

As I said in question number five, for us the most needed and important steps are summarized in the following aspects:

- **Gisovu site species restoration and job creation:** As I said during the time we conducted the field data collection, we were in a dry season and few of plant species that serve as chimpanzees' food source were ripen while others were developing new leaves, flowers or young fruits. This was a challenge because in addition to the semi habituation of this chimpanzee group, chimpanzees were usually moving looking for food. We realised that chimpanzees face food scarcity during this period and we suggested that planting more drought resistant plant species which serve as chimpanzees diet can be a long term solution not only for human-wildlife conflict resolution but also it will promote the tourism once started at this site. This activity will go together with the removal of exotic plant species in this site where a significant number of local communities will get involved.



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Even though all of these activities planned ahead are much needed and important, we are planning to start by a project proposal that will be focusing on restoration of plant species that serve as the core food sources of chimpanzees. This project will have a win-win solution to chimpanzees and surrounding local communities where chimpanzees will get enough food and no need of raided the crops of surrounding communities. The second benefit to the communities will be job creation where a large number of communities will be hired during Gisovu site restoration which will go with exotic plant species removal at this site.

The second output of this project will be education outreach where different community groups, local leaders, religious leaders, primary and secondary schools students and teachers around Gisovu site will learn more about the ecological and economical importance of chimpanzees to their wellbeing. This will raise the ownership and awareness of biodiversity conservation in this area.

After this project we are planning to write another project proposal about comparative study assessing the relationship between chimpanzee distribution with their food availability in two sites of NNP namely Mayebe and Gisovu. We have also an idea of extending this comparative study and include Cyamudongo forest fragment of NNP and Gishwati Mukura National Park (GMNP), Rwanda.

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

Yes, the Rufford Foundation logo was on all documents we used especially data sheets that were used during field data collection. Not only on datasheets, was the Rufford Foundation logo used on the project proposal submitted to RDB for research permit application. Also the logo was used as stickers and distributed to my field assistants. We mentioned to the communities and park managers that the research was carried under the funding of RF and they were very excited and interested in

the foundation. Through this message some park staff applied for RF and their projects got funded while others are still putting ideas together.

### **11. Any other comments?**

We firstly appreciated how Rufford Foundation funds projects based on a competitive basis. We also liked how you encourage young researchers through supporting their research projects without requesting the highest education level like MSc or PhD degrees. Sincerely speaking, this encourages earlier career researchers to keep stepping up into their career professionally. If I take the example of myself, I can't tell you enough how this funding sped up my passion and enthusiasm in primates research and conservation! I feel supported and motivated! I saw primates' conservation field very interesting and I saw that few Rwandan researchers are engaged into this field. This has also pushed me to stick on this career and strive to be the top Rwandan female primate researcher! The other thing that I have appreciated very much is the way Rufford Foundation deposits the grant to the project leader's bank account directly. Honestly, this helps a lot the researchers to escape some financial bureaucracies in their countries that usually delay project implementation.

## ANNEXES

### Relation of food availability on Chimpanzee grouping in Gisovu

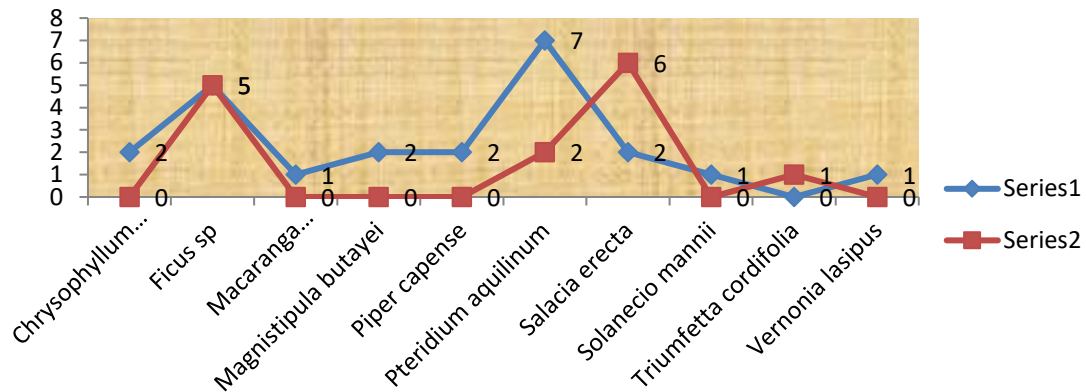
Variables		AF	AF, INF	AM	AM, AF	AM, AF, INF	AM, INF	INF	P- value
<b>Height</b>	5-10m	0	0	3	2	1	1	1	<b>0.000</b>
	11-20m	32	45	30	7	2	0	35	
<b>Total</b>		<b>32</b>	<b>45</b>	<b>33</b>	<b>9</b>	<b>3</b>	<b>1</b>	<b>36</b>	
<b>n=159, X<sup>2</sup>=20.82 df=6</b>									
<b>Food plant</b>	Ficus sp	5	6	7	4	1	2	25	<b>0.814</b>
	Licken	1	0	1	0	0	1	3	
	Salacia erecta	3	7	7	1	1	5	24	
<b>Total</b>		<b>9</b>	<b>13</b>	<b>15</b>	<b>5</b>	<b>2</b>	<b>8</b>	<b>52</b>	
<b>X<sup>2</sup>=7.102 df=10</b>									
<b>Fruit quantity</b>	1-25%	4	4	7	4	1	1	21	<b>0.004</b>
	26-50%	4	8	0	0	0	5	17	
	51-75%	0	1	7	1	1	1	11	
<b>Total</b>		<b>8</b>	<b>13</b>	<b>14</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>49</b>	
<b>X<sup>2</sup>=25.61 df=10</b>									

Table 1 indicates the relationship between chimp grouping with food availability and the height of trees (trees above ground) were found statistically significant to grouping patterns of chimpanzee with P-value ( $P < 0.001$ ,  $X^2 = 20.82$ ,  $df = 6$ ) and Adult female with infant (28.30%) were predominant seen at 10-20m. elsewhere fruit quantity on trees was statistically significant on grouping patterns  $P = 0.004$  ( $X^2 = 25.61$ ,  $df = 10$ ) with male and female- infants forming 55.10% of all groups. and the type of food eaten by chimpanzee had no statistical significant effect on recorded grouping,  $P = 0.814$  ( $X^2 = 7.102$ ,  $df = 10$ ).

Variables		AF	AF, INF	AM	AM, AF	AM, AF, INF	AM, INF	INF	UNID	P value
<b>Sites</b>	Bigogo	2	0	8	0	0	0	0	0	<b>0.000</b>
	Binazi	0	2	0	0	0	0	0	0	
	Icyumwumba	2	1	11	8	3	1	1	0	
	Uwabishyimbo	34	52	21	1	1	0	37	1	
<b>X<sup>2</sup>=90.52 df= 21</b>										
<b>Elevation</b>	2251-2300	1	5	0	0	0	0	2	0	<b>0.000</b>
	2301-2350	10	5	19	8	3	1	9	1	
	2351-2400	26	45	13	0	1	0	27	0	
	2401-2450	1	0	8	1	0	0	0	0	
<b>X<sup>2</sup>=79.67 df= 21</b>										
<b>Activity</b>	Feeding	10	14	16	5	2	0	8	0	<b>0.000</b>
	Grooming	0	3	0	2	0	0	0	0	
	Moving	15	13	13	1	1	1	16	1	
	Nesting	1	0	0	0	0	0	0	0	
	Playing	0	0	0	0	0	0	6	0	
	Resting	7	25	6	0	1	0	5	0	
	Self-grooming	4	0	1	0	0	0	3	0	
	Vocalization	1	0	4	1	0	0	0	0	
<b>X<sup>2</sup>=93.60 df= 49</b>										

The table 2 presents relationships of chimpanzee grouping, the elevation, activities they were doing while on field as well as sites of encountering. Both geographical elevation and related sites whereby the chimpanzees were spotted showed significant statistical effects on chimpanzee grouping with a statistical significant relationship to their recorded activities ( $P < 0.001$ ).

### Predominance of plant species eaten by chimpanzees at elevational gradient



This above graph shows the predominance of species that were eaten by chimpanzee below 2400m (in blue colour) and above 2400m (highlighted in red). More species eaten by chimpanzee were found below 2400m throughout indirect measurements.

### Potential food sources for chimpanzee

Species	Frequency	Percentage
<i>Syzygium guinneense</i>	3	1.75%
<i>Chrysophyllum rwandensis</i>	55	32.16%
<i>Chrysophyllum gorungosanum</i>	1	0.58%
<i>Ficus sp</i>	61	35.67%
<i>Macaranga kilimandscharika</i>	28	16.37%
<i>Parinari excelsa</i>	12	7.02%
<i>Magnistipula butayei</i>	1	0.58%
<i>Symphonia globulifera</i>	6	3.51%
<i>Galiniera saxifrage</i>	1	0.58%
<i>Carapa grandiflora</i>	1	0.58%
<i>Olea capensis</i>	2	1.17%
<b>TOTAL</b>	<b>171</b>	<b>100.00%</b>

The table 3 shows potential food sources for chimpanzee in Nyungwe National Park, whereby *Ficus sp* was prevalent in 61 observations (35.67%) followed by *Chrysophyllum rwandensis* with 32.16% with 16.37% of chimpanzee observed eating *Macaranga kilimandscharika*. Fewer were observed eating others plant species.