# Final Evaluation Report

We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF 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 – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

**Please DO NOT fill in and submit this form until the project has been completed.**

Complete the form in English. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

| **Your Details** | |
|---|---|
| **Full Name** | Felaniaina Rafenoarisoa |
| **Project Title** | Dietary flexibility and feeding strategy of *Eulemur cinereiceps* at the newly protected area Ankarabolava-Angakatrika, Southeast Madagascar |
| **Application ID** | 37663-1 |
| **Date of this Report** | 24th January 2026 |

**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 |
|---|---|---|---|---|
| Assess the population density of Eulemur cinereiceps in Agnakatrika | | | | Some rangers from the institution manager of the protected area helped our team to finalize the census and the distribution map of the white collared brown lemur. Therefore, it took less time than initially expected. With six teams of two persons, we were able to inspect the remaining 1/3 unprocessed of the forest in one week and made a final verification of the whole forest in four weeks during which five teams of the six were mobilized. We did not notice any inter-specific interaction with *E. cinereiceps* (even with the two troops that we followed for a year) but encountered very few isolated *Hapalemur griseus* especially near our field camp. However insignificant food competitions with some insects and birds were reported during lemur's feeding tree surveys. |
| Understand feeding ecology and categorize quantitatively the seasonality plant species intake | | | | Collecting feeding data and food sample was more complicated during food unavailability period. Sometimes lemurs were looking for food very far (two to three kilometers) from their territory edge. Locating and following our two groups were complicated and exhausting outside their home range as they behave |

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| | | | | differently (moving faster and higher, more vigilant, avoid too open areas…).<br>We were not able to quantify and rarely to identify food intake above the canopy cover. Instead, we just estimated it by using feeding times. |
| Measure *E. cinereiceps*'s food availability | | | | We established our two permanent 25mx25m quadrats (one for each home range) for phenology monitoring where lemurs' foods are representatively abundant. Finally, it was too much abundant that it took more times to monitor each quadrat than expected. Instead of collecting data every fifteen days we extended to thirty to avoid its impact on the feeding behaviour data collection which is the main core of this research. |
| Determine food nutrient composition | | | | We managed to collect 66 food samples. Some food samples were accidentally devastated by rats and others by mould because of the rainy season and humidity in the forest, as we just have a handmade solar drier. We tried to recollect food samples the next year but some plants species' fructifications are every two years or more. Overall, nine samples were damaged (ripe and unripe fruits), eight of them have been successfully recollected and one (called locally "Bemavo") did not bear fruit during all our investigation periods.<br>Most of the scientific names of plant species are still under identification but we currently |

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| | | | | know all families. |

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

**a)** We counted a population of 161 individuals (newborns are not considered) with the density of 6.5 individuals/km2. Individuals are distributed in 22 groups. Groups are composed averagely by 8±3 individuals, with a multi-male tendency (sex ratio = 1.3). We calculated a global fertility rate of 0.32% and averagely 0.31±0.24% for each group. Compared with the former census (using the same method as ours), we noticed a lemur's population growth of 148% in eight years. Conservation activities held in the forest seem to be successful for the last ten years.

**b)** Diet is composed of 66 different foods from 53 plant species (fruits, leaves and flowers) and fungi. Plant species belong to 15 families. The most consumed one, *Schizolaena elongata* is a local endemic species. Parts consumed plant are composed by 80% of fruits (42% ripe and 38% unripe), 18% of leaves and 2% of flowers.

**c)** A preliminary analysis of 65 food samples shows that lemurs food is composed by 62,75% of water in which 78,70% are from fruit (ripe and unripe). The main sources of water are plants called locally Matora and Angoto, which species scientific names are currently under identification. Dried samples are composed, in total by 70,61% of fiber, 16,48% of carbohydrates, 6,86% of fat, 4,63% of protein and 1,41% of undetermined content. Leaves have the higher concentration of protein and fiber while fruits have a higher concentration of fat. Leaves, fruits and flowers have almost similar concentration of carbohydrates.

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

Because of the three cyclones during the rainy season which lead to the increase of water levels in rivers surrounding the protected area and preventing us from reaching our research camp for several times, the malaria that affected almost all our fieldwork team, the initial chronogram was highly overturned. We rescheduled to try to cover all missing data and added some additional data collection times to ensure that all seasons are well represented. Financial readjustment from some funding was made to cover additional months' expenses.

Without a radio collar, locating lemurs every morning is very difficult, especially when they are already active. To minimize the risk of lemur group loss, we followed the group until they sleep (can be extended to 8h00 p.m.) and look for them at the earliest possible in the morning. Such strategy did not tackle the lemur's localisation difficulty during the full moon when cathemerality behaviour of the species occurs. Therefore

we mobilized every single person at the field camp, even the cook, to look for the group until they were in sight.

We noticed that when local guides are habituated in working with us for more than three months, some of them behaved routinely and sometimes collect a biased data. Therefore, we kept the most serious ones and made a rotation for the others.

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

Local community was involved in every single activity that we have made in the protected area. They were very helpful:

- when doing census and distribution map as they know every trail and forest location
- when collecting data as they can vernacularly identify plant species instead of attributing codes and make an herbarium of more than a thousand plant species
- when collecting food samples as they are used to climb trees and use local picking methods.

Some of the local community working with us benefited from one year (and a little more from other institutions because of the fieldwork extension that we had to make), and others from short-term remunerated employment which were really significant as it coincides with the lean period of this area and the year where most of the clove trees (the most important income sources of local people) did not flower.

We trained local guides on the uses of field equipment and data collections. They have learned about conservation, biodiversity/ecology and became aware of benefits having forest with high levels of endemicity and its conservation importance. They learned why some plant species should not be exploited for case making or firewood as they maintain lemur viability.

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

We plan to use our founding on daily and seasonally variation of food nutrients to formulate appropriate diets for any captive lemur species.
We expect to widen our study on daily energetic expenditure of *Eulemur cinereiceps* and how food spatial dispersion due to forest fragmentation affects lemur's energetic balance.
We also plan to study lemur disease, intestinal parasitism and the rule of consumed plants by *E. cinereiceps* in healing.

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

This work will be available at the Missouri Botanical Garden Madagascar library after completion and will lead to publications in indexed journals such as the International Journal of Primatology and Lemur news. A final report will also be sent to the ministry of environment and sustainable development as the head of the regional direction of the ministry requested us when we met him. As a part of my PhD degree, it will be presented at the University of Antananarivo and will be available at the University's library.

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

Due to the high level of fragmentation, lemurs cannot easily access resources and sometimes need to travel through several kilometers of deforested areas to locate food. Restoration which aims to link forest fragments and increase lemur food availability is one of the main priorities that must be held in Agnakatrika. Large-scale reforestation with sustainable management plans, using species that can be used for case making and firewood outside the protected area should be initiated to minimize pressures affecting the biodiversity and its habitat.

Ecological monitoring (census of lemurs, phenology and botanical transects) is still crucial to evaluate demographic tendency and habitat health of the *Eulemur cinereiceps*.

**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?**
Yes, I have used The Rufford Foundation logo in every presentation I have made at the University of Antananarivo and mentioned that this researched is co-funded by the Rufford foundation.

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

- Felaniaina Rafenoarisoa: principal investigator
- Fefy Niaina Ravahatramananjarasoa: researcher assistant, student from the University of Antananarivo
- Rado Rabearisoa: research assistant, student from the University of Antananarivo
- Jarie: local community – assisted us to collect data and lemur food sample.
- Noria: local community – assisted us to collect data and lemur food sample.
- Delory: local community – assisted us to collect data and lemur food sample
- Angela: local community – assisted us to collect data and lemur food sample
- Zerta: local community – assisted us to collect data and lemur food sample
- Vesta: local community – assisted us to collect data and lemur food sample
- Zeometry: cook
- Lovre: Local rangers – assisted us during census and lemur's distribution mapping
- Julien: Local rangers – assisted us during census and lemur's distribution mapping

- Velo: Local rangers – assisted us during the census and lemur's distribution mapping
- Leonard; Local rangers – assisted us during the census and lemur's distribution mapping
- Genoi: Local rangers – assisted us during the census and lemur's distribution mapping
- Poety: Local rangers – assisted us during the census and lemur's distribution mapping

**10. Any other comments?**

I would like to express my deepest grateful to the rufford foundation for providing financial support for this research. Your help provided a valuable impact on the accomplishment of all activities that we have held. Below we are pleased to share with you some photos of our fieldwork.

**Fig.1 Field camp**


**Fig.2 implementing the handmade solar dryer**

**Fig.3 collecting food sample using special tools to reach high up items**

**Fig.4 collecting food sample**

**Fig.5 Weighing and packing food sample**


**Fig.6 Implementing rain gauge**


**Fig.7 Grantee, collecting wind parameter data**


**Fig.8 Grantee teaching research team**

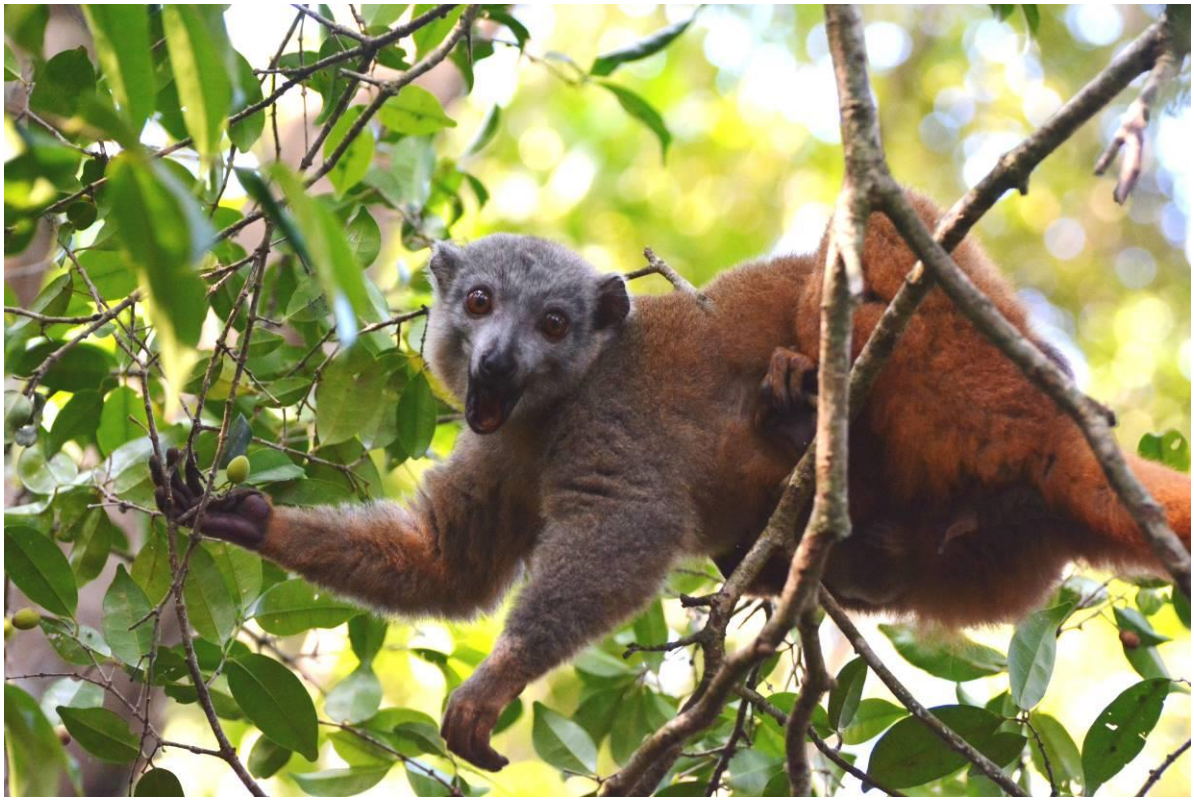

**Fig.9 White collared brown lemur female swallowing fruit**

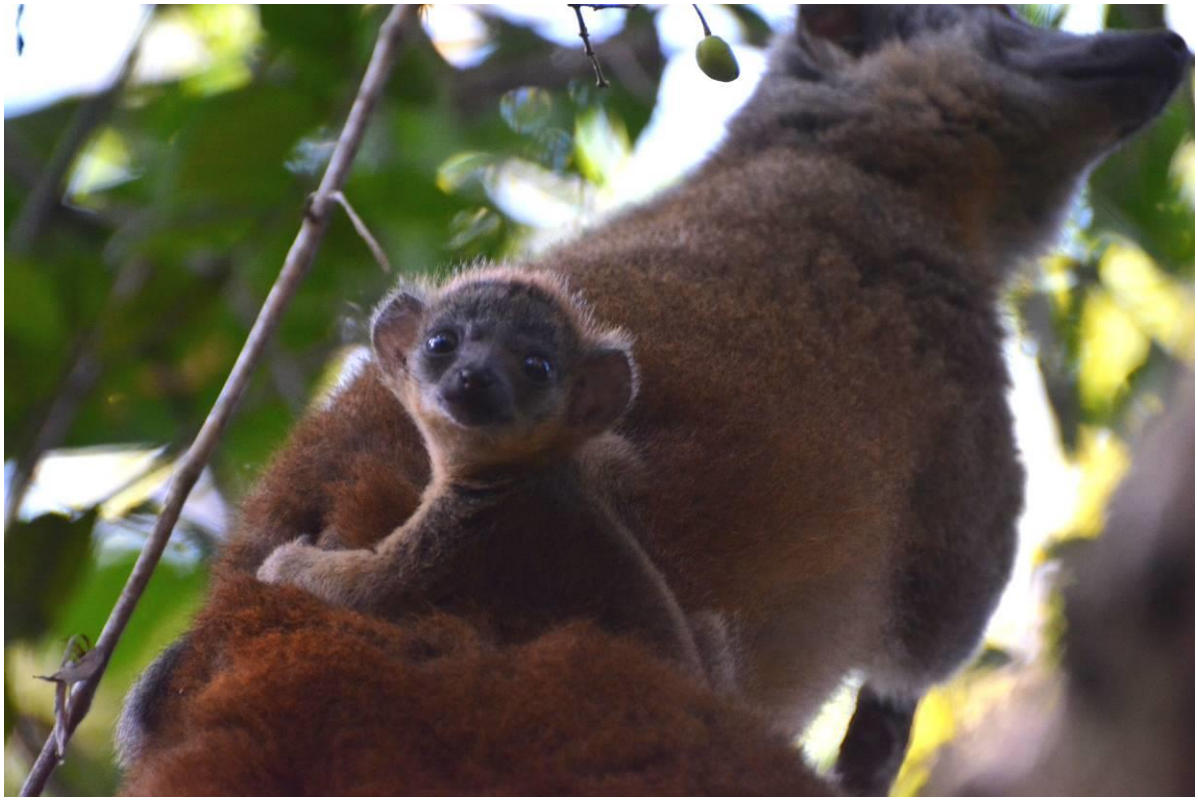

**Fig.10 Mother and infant white collared brown lemurs**

**Fig.11 White collared brown lemur male swallowing liana fruit**

**ANNEX – Financial Report**

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