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Report For

Project Rufus:

In situ conservation of the *Pteropus rufus* fruit bat in the Sainte Luce littoral forest, southeast Madagascar

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1. Project Summary

Project Rufus addressed the conservation needs of the vulnerable *Pteropus rufus* (*P. rufus*) (IUCN 2018) in the unique and fragmented Sainte Luce's littoral forest (SLLF). *P. rufus* provides a crucial role in preserving the SLLF ecosystem, through pollination and seed dispersal services. However, due to human disturbance and habitat loss (Roberts et al., 2016), *P. rufus* populations have experienced declines across Madagascar (Andriafidison et al., 2008). Over the two years, Project Rufus has worked to protect a colony of *P. rufus* roosting in an originally unprotected SLLF fragment, with significant risk of human pressure and habitat change. The project's primary objectives were:

1. Build local, national and international knowledge and capacity to ensure sustainable protection for *P. rufus* and its habitat
2. Increase population numbers of *P. rufus* by safeguarding and sustainably managing its habitats
3. Generate sustainable income through eco-tourism for ongoing *P. rufus* conservation
4. Maintain regular communication with stakeholders to ensure research, conservation plans and findings are consistently shared and coordinated

A community-enforced conservation zone (Exclusion Zone) has been established in the fragment surrounding the colony's primary roosting site, which will legally enforce 'no logging or bat hunting' after the final stakeholder and *dina* signing meeting in February 2018. The established Exclusion Zone is considerably bigger than first planned, at 47.61 ha; 15 times larger than the originally proposed 3.14 ha zone. This means that a significant area of biodiverse SLLF (4.2% of total forest area) is being protected from hunting, logging and habitat change. *P. rufus* habitat, roosting sites and food sources are thus being conserved, enhancing the long term survival of the species regionally. Population census research has shown an estimated 450% population increase of adult *P. rufus* at the roosting site from September 2016 to December 2017 and two generations of young born at the roosting site during Project Rufus. Additionally, a community managed elevated viewing platform was constructed in August 2016. The viewing platform has been in operation in the exclusion zone since September 2016 with eco-tourism income from the bat hide providing four local communities with a monthly average of 93,125 MGA between September 2016 and December 2017.

Throughout the project, community meetings and regular training sessions were held to increase local knowledge and capacity to sustainably protect *P. rufus* and its habitat. The Exclusion Zone has been maintained and patrolled by the trained bat patrol guides (Forestry Police), with no reported incidences of logging following initial community confirmation of the Exclusion Zone. Through community and stakeholder meetings and weekly liaison with Forestry Police, SEED have supported the local community to maintain patrol of the Exclusion Zone and their conservation efforts in minimising human disturbance to the *P. rufus* colony.

Unfortunately, due to issues with obtaining research permits, SEED has been unable to fit GPS tracking devices to any bats. SEED maintains a commitment to this important research and, following the confirmation of the necessary permit and following the *P. rufus* breeding season, will continue attempts at fitting collars to a minimum of three bats (*see section 2.5*).

This report covers the final 6-months of the project period (August 2017 to January 2018), as an addition to the 18-month interim report submitted in July 2017.

2. Project Activities: August 2017 – January 2018

2.1 Community meetings and surveys conducted in Sainte Luce, Mahatalaky and Tsiharoa (communities using the S6 forest fragment for logging)

Throughout the duration of Project Rufus, community and stakeholder meetings have been a crucial in maintaining open dialogue and providing opportunities for discussion between the project team, COBA (Local Forest Management Committee), FIMPIA (Forest Management Committee) and the wider communities reliant on the S6 forest fragment.

In December 2017, a stakeholder meeting was held with the Forestry Police and representatives from COBA and FIMPIA, at SEED's research camp in Sainte Luce (*Figure 1*). The meeting focussed on stakeholder perceptions of the Exclusion Zone and bat hide in order to understand community attitudes toward Project Rufus and discuss the impact of the income generated through the community ecotourism efforts. There was a general consensus that the Exclusion Zone and bat hide have been successful, as there has been a noticeable increase in bat population since the Exclusion Zone was erected. A COBA representative from Sainte Luce summarised community perceptions of the project: *'The project has been successful because there is money from the bats and the Chief is planning on building a house by the hospital for sick people using some of the money from the bat hide. Protecting the bats is worthwhile because it is improving our community.'*

Figure 1. Stakeholder meeting with Forestry Police, representatives from COBA and FIMPIA, and project staff

Income from ecotourism activities has so far been utilised for various community initiatives. Tsiaharoa North have spent the money on building a pre-school and Tsiaharoa South have invested the money to start a community loans and savings group project. Sainte Luce have used income to fix bridges and for community events such as Madagascar's Independence Day. Mahatalaky have

invested the money in buying equipment to provide electricity to more rural communities surrounding the village.

After December 2017, SEED's financial support for the local Forestry Police Exclusion Zone patrols ended with the close of Project Rufus. During the final stakeholder meeting, SEED have pledged continued technical support to the Forestry Police and the Exclusion Zone. The community have agreed that the bat patrols will continue to be managed by the Forestry Police from January 2018 and paid for using part of the income generated through the bat hide ecotourism activities.

2.2 200m Exclusion Zone around P. rufus *roosting site*

The 'no logging or bat hunting' rules of the Exclusion Zone have been in force since August 2016, when the area was agreed on by community members. The Forestry Police have since undertaken daily patrols to ensure compliance with the Exclusion Zone boundaries since October 2016. The Forestry Police have recorded incidences of logging, but none have been documented in the Exclusion Zone as per agreements with the community.

To have the agreed Exclusion Zone legally enforceable at the community level, project staff met with the director of DREEF (Regional Directorate for Environment and Forest) to discuss and finalise the amended *dina* (local law) *(Figure. 2)*.

Figure 2. Meeting with DREF to discuss and finalise amended *dina*. January 2018

In January 2018, a stakeholder meeting was held to present the finalised *dina* (*Figure 3*). Attendees included: the Director of DREF; QMM representative; the President and Vice President of FIMPIA; a representative from Mahatalaky and the Chef Quartier; Chef COBA; Opinion Leaders from Mahatalaky, Tsiharoa North, Tsiharoa South and Sainte Luce; and SEED project staff. During the meeting, the additions to the *dina* regarding the Exclusion Zone were agreed on by all stakeholders. The new system of prosecutions for the hunting of bats and logging of trees inside the Exclusion Zone will now be written into FIMPIA's existing *dina* in February 2018, during their annual assembly. Thereby, all regional stakeholders will have agreed on the new rules and they will be ratified by the regional Anosy court. Subsequently, FIMPIA will take total responsibility to enforce the Exclusion Zone rules and patrol the area. Project Rufus has thus achieved its aim of ensuring sustainable

Figure 3. Stakeholder meeting to agree on finalised rules for Exclusion Zone to insert into FIMPIA's dina

protection for *P. rufus* and its habitat, as the community and regional stakeholders now protect the forest around the roosting site. To increase compliance with the *dina*, eight signs stating the rules and associated penalties of the Exclusion Zone have been erected around its perimeter.

2.3 Community managed elevated P. rufus *viewing platform*

The community managed bat hide has been in operation in the Exclusion Zone since September 2016 and has provided a sustainable source of income for local community activities (*see section 2.1*). Money received from the bat hide is managed and distributed by the four community COBAs. SEED Conservation Programme (SCP) staff and volunteers visit the bat hide for conservation research purposes, with each volunteer paying 10,000 MGA to visit the hide. From June 2017 to December 2017, volunteers have paid a total of 230,000 MGA to visit the hide for research.

Figure 4. The bat viewing platform (left) and the view from the bat viewing platform (right)

In addition, Manafiafy Beach and Rainforest Eco-Lodge provide guided tours to the Exclusion Zone and elevated viewing platform, where tourists also pay 10,000 MGA per visit. Between June 2017 to December 2017, 80 guests have visited the hide, with 800,000 MGA generated for COBA.

Overall, the viewing platform has generated 1,130,000 MGA from June 2017 to December 2017 for the local community, bringing the total income generated by since the bat hide launch in September 2016 of 1,490,000 MGA, a 93,125 MGA (£26) monthly average over 16 months. Madagascar remains one of the poorest countries in the world (UNDP 2016), where 60% of people live in extreme poverty, on less than US $1.25 a day (UNDP 2016). Therefore, this income from tourism will create significant benefits for the Sainte Luce community. SEED have also discussed opportunities for further tourist visits to the hide through a recently opened hotel in Sainte Luce.

2.4 Tree-planting site for fig and guava trees

134 fig and guava seedlings were planted as a source of food around the S9 SLLF fragment, by children from the Sainte Luce community on World Environment Day (5th June 2017). Monitoring of seedling success in December 2017 showed that there has been an 84% survival rate of these seedlings planted on World Environment Day. The fig and guava trees will help increase food availability to *P. rufus* and help sustain the increase in population seen over the past 24 months.

Figure 5. Children with fig and guava trees on World Environment Day in 2017 (right) and survived trees in 2018 (left)

2.5 In-situ *research*

An overall increase in *P. rufus* population size in the Exclusion Zone has been recorded over the course of Project Rufus. Initial observational estimates of the bat population conducted in September 2016 recorded 100 individuals at the roosting site. Current estimates from SCP

researchers and Forestry Police's data suggest that, consistent with June 2017 numbers, there are upwards of 450 adults and around 100 young since November 2017, representing a 450% increase in adult colony size. This is a huge success for conservation of the vulnerable (IUCN 2018) *P. rufus.*

Unfortunately, efforts to fit GPS devices to the bats have remained suspended due to delays in acquiring the necessary research permits. SEED last applied for the research permits from the Ministry of Environment in February 2017, since which there have been four changes in key Ministry personnel and no subsequent handover of SEED's original permit request or enquires regarding its status. SEED submitted the appropriate documents with each Ministry staff change over, however, the documents were lost between 16th November 2017 to date. Despite new documents being handed to the Ministry, the new Director was unable to locate them in the first week of January 2018. SEED is in continuous contact with the Ministry and will provide the necessary documentation to acquire the research permit needed for trapping the bats as soon as possible.

The *P. rufus* colony currently have young and therefore tagging will not be able to take place until April 2018, when the young are not reliant on their mothers. SCP will then work to collar a minimum of three bats and subsequently collect a minimum of 12 months of data, monitoring movements of individuals and mapping activity patterns, thus providing useful data for future habitat management. An open-access, peer reviewed paper will be published following analysis of data captured.

Figure 6. *P. rufus* at roosting site and suckling two young

2.6 *Training and capacity building of local guides in monitoring and habitat analysis of* P. rufus

SEED intended on collaborating with local guides and use participatory data collection to monitor bat populations in the Exclusion Zone. SEED's aim was to build the capacity of local guides to be able to effectively implement data collection techniques and also improve the guides knowledge of *P. rufus* to be able to spread information to the rest of the community.

Weekly meetings with the Forestry Police have been an opportunity to review data collection techniques, discuss any issues with the Exclusion Zone and report bat sightings or movements. SCP have helped build the capacity of the Forestry Police by showing them diagrams on how to estimate numbers of and distance from bats. SCP have also explained data input onto data sheets, the importance of the accuracy of this data recording and how to improve the accuracy and reliability of data entry. This has improved the Forestry Police's scientific research skills and enables them to continue collecting accurate data in the future.

2.7 *Educating the community about* P. rufus *and the importance of conserving its habitat*

As part of SEED's community engagement programme, SCP hold weekly youth education classes at a free conservation club, Club A, informing over 200 children about forest and animal conservation in the context SEED's work in the region, including *P. rufus*. Over the last six months, topics have covered forest structure, the importance of seed pollinators such as *P. rufus* and forest fragmentation.

Figure 7. Club A sessions on forest structure, fragmentation and conservation

2.8 *Stakeholder coordination*

Regular stakeholder liaison and coordination has been crucial for the sustainability and development of Project Rufus. The stakeholder meeting with Project Rufus stakeholders; DREEF, COBA, FIMPIA, QMM representatives and community representatives worked towards the finalisation and legal enforcement of the *dina*, with rules of the Exclusion Zone *(see section 2.2).* The meeting provided a platform for community leaders to discuss any issues regarding the Exclusion Zone with the Director of DREEF. Having the Director engaged with SEED's conservation projects and aims, improves long term viability of all initiatives, including Project Rufus.

SCP have produced a summary guide for Manafiafy Beach and Rainforest Lodge with details of all SCP projects, including Project Rufus, which enables their guides to inform tourists and guests about the bat viewing platform and arrange tours to the hide. The summary guide has also been provided to the new hotel in Sainte Luce (*see section 2.3*). To ensure project sustainability and the community not relying on SEED for ecotourism income to the viewing platform, SEED concentrated on coordinating Manafiafy Beach and Rainforest Lodge with COBA. SEED facilitated the organisation of paid tours from lodge guests to the bat hide, thus the community are receiving sustainable ecotourism income from hotel guests into the future.

Capacity building with the Forestry Police has improved their data collection and monitoring skills; enhancing their ability to safeguard the Exclusion Zone, *P. rufus* and ultimately the SLLF. Through stakeholder meetings (*see section 2.1*), SEED have successfully encouraged the Forestry Police to

work with FIMPIA and continue to patrol the Exclusion Zone, thus improving the community-led conservation of the forest.

3. Conclusion

Major successes of Project Rufus include the establishment of the 47.61ha exclusion zone and the fines for logging and hunting within it being agreed on by all stakeholders and written into FIMPIA's *dina* in February 2018, making them legally enforceable. This has resulted in the important area of habitat around *P. rufus'* roosting site having long term protection and being conserved from human disturbance.

The construction of the bat viewing platform and coordination with the local stakeholders, Manafiafy Beach and Rainforest Lodge and the hotel in Sainte Luce, has provided the local community with a sustainable source of ecotourism and an incentive to maintain protection of the exclusion zone and conserve *P. rufus*. The community have invested this money in development initiatives and events, showing the tourism money generated through Project Rufus has aided community development.

Stakeholder and community meetings have enabled open discussion and SEED to support the community in the protection of their forest. The project has allowed SEED to build an on-going working relationship with FIMPIA and COBA, two key environmental stakeholders in Sainte Luce. Meeting with DREEF to finalise the *dina*, it being agreed on by community leaders and signed at FIMPIA's annual assembly, has been a significant step towards overall enhanced conservation of the SLLF and regional *P.rufus* colonies.

Despite the project's clear successes, SEED has suffered consistent set-backs with research objectives *(see section 2.5).* Looking forward, SEED intends on acquiring research permits as soon as possible, fitting GPS tracking devices on the bats after April 2018 and collecting data on their activity patterns for 12 months. These research activities will now be implemented separately from Project Rufus, with all project funders and stakeholders informed of key milestones and successes when possible.

4. References

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