



seed **madagascar**

sustainable environment, education & development

**SEED Madagascar Conservation Programme:**

**6-Month Biodiversity Report  
(June 2018)**

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SEED Madagascar's Conservation Research Programme (SCRP) has been working in the threatened littoral forests of Sainte-Luce in southeast Madagascar for more than 16 years. In the past six months the team has continued to promote a holistic approach to conservation in the region by building strong collaborations within the local community and stakeholders. Research into the unique flora and fauna has continued from 2017 projects. Anthropogenic activities persist in threatening the forest and marine habitats of Sainte-Luce, with evidence of deforestation and fragmentation ongoing, and the overarching presence of large-scale mining entering the majority of the fragments the wildlife and communities rely on. Over the past six months SCRPs have focused on close relationships with the community to promote the importance of a healthy ecosystem for sustainable livelihoods, whilst increasing appreciation and respect for the natural world. Through recent efforts in turtle conservation and sustainable lobster fishery monitoring, the programme has further expanded into the marine environment alongside our social and terrestrial research and conservation efforts. Amongst our long-term projects and activities, this year the programme hosted the British Ambassador, Dr Phil Boyle, participated in the Annual FIMPIA Assembly hosted in Sainte Luce, and has conducted various knowledge sharing and action coordination meetings with QMM and Tropical Biodiversity Social Enterprise (TBSE).

This report summarises SCRPs work in the first six months of 2018, including studies that have continued or been built upon from previous years, novel projects and SCRPs involvement in SEED's wider environmental programmes. Reports, publications and further detail on previous work can be found on the SEED website.

### Lemur Research

Established in 2010, The 'lemur transects' survey is one of SEED's longest running research projects. It aims to provide accurate long term population research monitoring trends, spatial distribution and density of the three nocturnal lemurs present in the Sainte Luce forests; southern woolly lemur, *Avahi meridionalis* (endangered), fat tailed dwarf lemur, *Cheirogaleus medius* (least concern) and *Microcebus antanosy*. Over the past six months over 40 hours of nocturnal surveys have been conducted within S7, S8, S9 and S17, assessing seasonal changes in lemur distribution and occurrence. These surveys are ongoing. This year has seen the results of our previous genetic studies and our long-term surveys presented at the IUCN SSC Meeting held in Antananarivo. Our work has helped to provide important evidence in support of conserving Sainte Luce's littoral forests, and has leveraged the case for their environmental protection on the basis of lemur conservation. The SCRPs team will continue to gather vital long-term data on lemur population trends and to monitor the health of the four species present in Sainte Luce. The SCRPs team will continue to gather vital long-term information on the lemur populations and use this data to monitor the health of these species in Sainte Luce.

The first six months of radio collared mouse lemur research was completed in April, with SEED's Executive Research Coordinator and Oxford Brookes PhD Student Sam Hyde-Roberts, tracking individuals using lightweight HOLOHil collars. Mouse lemurs were collared in fragments S8 and S9. Data will provide vital information on how they utilise their habitat,

organise their social structure, and select their nesting sites, while elucidating elements of their general ecology that currently remain unknown. Sam will return to the project later this year in order to target lemurs in S17 to further understand these understudied and threatened lemurs.



This April also saw the conclusion of the first field session of our collaboration with Oxford Brookes University as PhD candidate Elena Racevska arrived in Sainte Luce. Elena arrived in Madagascar in June 2017 and is studying the role of collared brown lemurs (*Eulemur collaris*) in the regeneration of the littoral forest of Sainte Luce and Mandena. She is collecting data on these lemurs' seed dispersal, as well as investigating secondary dispersers and seed predators in the area. Elena will continue her work later this year, further investigating the local human population's reliance on forest resources, using this information to complement her brown lemur research and to model the effects that potential local extinctions could have on livelihoods<sup>i</sup>.

### Reptile and Amphibian Research

Through genetic sampling in 2015 and 2016, SCRP have confirmed the presence and identities of 21 species of amphibian and 46 terrestrial reptiles, and are working on the formal description of at least 15 novel candidate species. Our first output came this February with the publication<sup>ii</sup> of new taxonomic evidence pertaining to the identities of two enigmatic species of microhylid frog; *Plethodontohyla alluaudi*, with the Executive Coordinator Sam Hyde Roberts co-authoring a study into this cryptic genus. More formal identifications are expected in the coming months, with thanks to our collaborators and friends at the Center for Integrative Biology in Portugal and museums in Italy and Germany. The team continues to search for difficult to detect species and hopes to produce a genetic account of all herpetological inhabitants.

2017 saw the start of SCRP's new long-term monitoring programme for the reptiles and amphibians of Sainte Luce, with an adjusted and robust methodology. The aims of this project

are similar to those of our long-term lemur monitoring survey, to collect vital information on species diversity and abundance, whilst providing an opportunity to identify temporal population trends. Throughout 2018 the team have deployed Visual Encounter Surveys (VES) along transects both diurnally and nocturnally in S7, S8, S9 and S17. As of June 2018, all navigable transects have been completed, with over 400 herpetological records so far. A small number of species with low detectability, such as *Liophidium* and *Pseudoxyrhopus* snakes, have already been recorded, and we hope to find more during the upcoming months.



This year we hosted Mike Pointer, a Masters student from the University of East Anglia, who carried out vital and unprecedented data on the critically endangered *Phelsuma antanosy* populations in Sainte Luce. Alongside SCRP's head guide, Hoby, Mike tissue sampled 30 individuals within fragments S7, S8 and S9, allowing for population level genetic analysis to identify potential differences in the gecko genome between isolated forest fragments. These results can also be compared with other populations in the Anosy Region in order to identify the most healthy populations for future potential translocation and captive breeding projects. Bio-metrics were also taken for morphological comparisons between populations. Samples will be transferred to UEA in the coming months for genetic analysis.

Notable behaviour recorded over since the establishment of herpetological surveys 18 months ago has included two short notes (in production) highlighting interesting and previously undescribed predator-prey interactions. Many thanks to Franco Andreone and Gonçalo Rosa for collaborating on our upcoming lamphroiid snake dietary observations note.

### Bat Research

After receiving funding from the Rufford Foundation, Phoenix Zoo, Minnesota Zoo, James Hall, Clark Mitchel and Lake District Wildlife Park, Project Rufus commenced in January 2016. It seeks to engage and work with the local community in order to protect and increase the local population of the Malagasy flying fox, *Pteropus rufus*, whilst providing a source of income for local communities. Although the majority of the project has come to a close, the SCRP team continue to monitor the bat roost hide constructed by the project, and assess the

flying fox population and disturbance. Early this year the flying fox pups successfully developed and fledged from the nest; yet another fruitful breeding year at the roost site since the incursion of the exclusion zone. The roost regularly hosts roughly 450 bats and receives tourism from the local ecolodge.



Due to Project Rufus, Sainte Luce continues to be one of the only Malagasy communities to pass the prohibition of bat hunting into law, further reducing disturbance to the flying fox population in the local area. SCRP will continue to visit the roost monthly in order to carry out population estimates and to monitor the exclusion zone in terms of logging and other human disturbances, supporting the local COBA to protect the roost. In March SCRP attended the annual FIMPIA meeting, where issues of forest management for the region were discussed. The head of DREF presented the dina written by SCRP and the community, reaffirming the ban on flying fox hunting and logging in the exclusion zone and the fines for infringement. The FIMPIA assembly reconfirmed their support of the dina.

GPS collaring has not been attempted due to the presence of young within the colony. Potential capture sites are being assessed and attempts will be made just outside of the Sainte Luce commune to target the bats where they congregate more consistently within sisal or fruit plantations<sup>iii</sup>.

### **Botanical Research**

Understanding the basic structure of the forest in which SCRP work is perhaps the most important survey SCRP undertake. Established in 2017, the survey will continue as a long-term research project in order to identify the rate of forest structure change throughout fragments. The forest fragments in Sainte Luce receive differing levels of logging intensity for firewood and timber collection, with S6 and S7 designated as community usage zones and S8, S9 and S17 designated as community protected areas.



In each of the forest fragments 10 x 10m quadrats are constructed along existing transects. Their location is randomly calculated using a die to generate distance along transects, left/right of path and distance off the transect path. The methodology for the surveys falls into three activities: 1) understory density is calculated using a 3m pole divided in 0.5m sections; 2) leaf litter and canopy cover are measured in each of the quadrat quarters; 3) diameter of the trees at breast height. Each activity builds on our knowledge of the density of the forest cover. After roughly a year of surveying, initial results are being analysed to compare the differences in structure between S7, S8, S9 and S17. This will allow us to identify any potential links between forest structure differences and the populations of reptile, amphibian and lemur taxa.



## Reforestation

Reforestation is an integral part of conservation, and perhaps the most important activity that could take place in Sainte Luce. SEED is currently seeking funding for our reforestation project, Project Ala, looking to connect remaining littoral forest fragments isolated by expanses of scrub land and agriculture after historic logging and burning. The project is targeting four remnant forest blocks north of the community protected fragment S8 and SCRIP has provided technical expertise in the development of this programme.

Four 20m wide habitat corridors are proposed to facilitate and promote the dispersal of the threatened red collared brown lemurs *Eulemur collaris* and southern woolly lemurs *Avahi meridionalis*, as well as the smaller species of mouse lemur (currently awaiting identification) and fat tailed dwarf lemur (*Cheirogaleus medius*). In turn, the proposed corridors will provide additional habitat and dispersal opportunities for a number of taxa, including invertebrates,

small mammals, amphibians and reptiles, such as the critically endangered day gecko *Phelsuma antanosy* which has isolated populations scattered across the remnants.

In May the SCRП and Environment team met TBSE and QMM at the Mandena protected forest zone to visit their habitat corridor and reforestation experimental sites alongside Oxford Brookes Primatologist and Member of the IUCN/SSC Primate Specialist Group, Dr Giuseppe Donati, in order to further our knowledge for developing Project Ala. Corridor and reforestation sites under variable cultivation strategies (topsoil use, invasive plants vs. natives, etc) were visited and with our strong collaboration, we hope to further develop Project Ala and capitalise on this expert knowledge.

Current stocks of acacia being grown for initial planting continue to grow quickly, with the SCRП team regularly monitoring the nursery and carrying out maintenance work such as weeding and additional seeding.



### **Lobsters – Project Oratsimba**

Project Oratsimba has been promoting sustainable lobster fisheries management since June 2013. Thanks to a grant from Defra's Darwin Initiative the third phase of the project is now fully funded until 2021. This next phase is focussed on strengthening local and regional capacity to implement adaptive, sustainable fishery management, economically empowering 850 fishers and contributing to poverty alleviation amongst 4,250 people in the Sainte Luce, Elodrato and Itapera communities.

With the lobster season beginning in April, the SCRП team have been assisting project Oratsimba's data collectors in measuring catch effort and composition in order to assess the status of the fishery and compare data across the months. Early morning surveys conducted by our volunteers on the main fishing beach at Manafiafy have taken hands-on measurements of the day's catch. This data has already provided fascinating insights that not only contribute to the development of the project but also help the community to make informed decisions

about the management of their fishery. The data contains clear evidence that national regulations are often broken by fishers in relation to catch size and class and provides strong support for planned community education activities. The data has also shown the effect that No Take Zone closures can have on increasing lobster catch related to fishing effort and how this can be used as a tool to manipulate lobster price/kg for the benefit of fishers.



### Marine Turtles

Following training of the local Turtle Association and daily patrols along 6.4km of coastline during the nesting season, one loggerhead turtle, *Caretta caretta*, nest was discovered, and protective fencing was installed by Manafiafy Lodge. Consisting of 57 eggs, the nest hatched on the 26th January, with 45 baby turtles hatching and successfully reaching the sea. Nine eggs failed to hatch and three hatchlings did not survive the emergence, contributing to an overall successful emergence rate of 81.8%. After discussions and training with the Turtle Association there was no interference with the nest this year, as opposed to previous seasons, allowing a natural hatching event with no restrictions on hatchling movements.

No other nests were detected along the beach, suggesting that the nesting population of loggerhead turtles in Sainte Luce is severely at risk. This highlights the need for further coordinated action by local stakeholders to promote the conservation of the species.

Throughout January to April, community meetings and regular environmental education sessions were held to increase local knowledge and sensitisation to the value of marine turtle conservation. Approximately 750 local community members were present for presentations led by SCRP, the Turtle Association, and Manafiafy Beach & Rainforest Lodge. The presentation also explained the best practice to follow after finding a nesting or stranded turtle, and subsequently reminded the community of the potential toxicity of eating turtle meat following the death of eight children in Antananarivo in January 2018. In March, to mark the culmination of Project Fano, over 60 children from the local community joined SCRP in a



beach clean-up along a small section of the beach where turtle patrol surveys occurred. Five full sacks of rubbish were collected, including plastic bags, fishing line and rope, followed by a turtle sand sculpture competition.



Manafiafy Lodge has established a “pay to release” scheme for turtles found by fishermen or along the beach, and SCRP have been involved in the coordination of release of a number of turtles in 2018, limiting interference with the turtles and speeding up release processes. One particular highlight was the successful release of an enormous adult leatherback turtle *Dermochelys coriacea*, where the SCRP team removed tangled fishing lines and kept the animal cool whilst the Lodge negotiated its safe return to the sea<sup>iv</sup>.

### Environmental Education

The SCRP environmental education programme, Club Atsatsaky (Club A), is run on a weekly basis in Sainte Luce. The lessons take place in in Ambandrika and Manafiafy schools and over 100 children attend each week. Lesson topics during the first half of 2018 have ranged from biological lessons on marine turtles and spiders, through to key conservation information on marine litter and sustainable fisheries practice – including an excellently acted lobster play.

January saw a visit from Nessa Darcy, a previous SCRP Research Assistant, who hosted a Wild Postcard Challenge event which gave children of Sainte Luce the opportunity to showcase their artistic flair. The winning designs will be printed and shared all over the world.

World Environment Day celebrations were held on the 9<sup>th</sup> June. The theme for this year’s global event was “Beat Plastic Pollution”, an incredibly relevant issue in Sainte Luce when considering the reliance on marine fisheries. After the end-of-scheme Club A quiz with all the local children, recapping lesson content from the last 10 weeks at Manafiafy, the group marched to the beach where SCRP conducted Project Fano in order to collect as much rubbish as possible, separating any items that could be recycled. In the afternoon, alongside the

Environment and Sustainable Livelihoods team, SCRP delivered a talk to the local community on upcoming reforestation plans (Project Ala) and highlighted the importance of healthy forests. This was followed by a tense football match between Manafiafy and Ambandrika, with new footballs donated to each team. The day concluded with an open-air bush theater presentation of footage showing the effects of humans and plastics on the marine environment, with translations in Malagasy.

## Conclusion

The past six months have seen the successful completion of Project Fano, the development of new projects and ongoing contributions to valuable scientific research. Through the collection of baseline data and site visits conducted earlier this year, our knowledge for SEED's wider reforestation and habitat corridor work has vastly increased. Successful fledgling of flying fox young at the protected roost in S6 has occurred for a second time since the establishment of the exclusion zone, and flying fox presence has stabilised to consistently higher levels. Through the hard work of staff and volunteers our long-term monitoring surveys for lemurs, herpetofauna and forest structure continue to increase our knowledge of the Sainte Luce littoral forests and the organisms that inhabit them.

The vital conservation, research and community work carried out by SCRP could never be achieved without the help from our international volunteers, the partnerships with the local community and stakeholders, and the support from The Ministry of the Environment and Forests. SEED would like to thank everyone involved with the continued success of the programme and is looking forward to our upcoming conservation and research projects.



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<sup>i</sup> Project Microcebus: Promotion and in situ conservation of an undescribed species of *Microcebus* in the Sainte Luce littoral forest, southeast Madagascar (July 2017 - January 2018)

<sup>ii</sup> Bellati A, Scherz MD, Megson S, Hyde Roberts S, Andreone F, Rosa GM, Noël J, Randrianirina JE, Fasola M, Glaw F, Crottini A (2018) Resurrection and re-description of *Plethodontohyla laevis* (Boettger, 1913) and transfer of *Rhombophryne alluaudi* (Mocquard, 1901) to the

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genus *Plethodontohyla* (Amphibia, Microhylidae, Cophylinae). *Zoosystematics and Evolution* 94(1): 109-135.

<sup>iii</sup> Project Rufus - In situ conservation of the *Pteropus rufus* fruit bat in the Sainte Luce littoral forest, southeast Madagascar (18-month project report)

<sup>iv</sup> Project Fano - In situ research and community-led conservation of loggerhead turtles in Sainte Luce, southeast Madagascar (2017 Report)