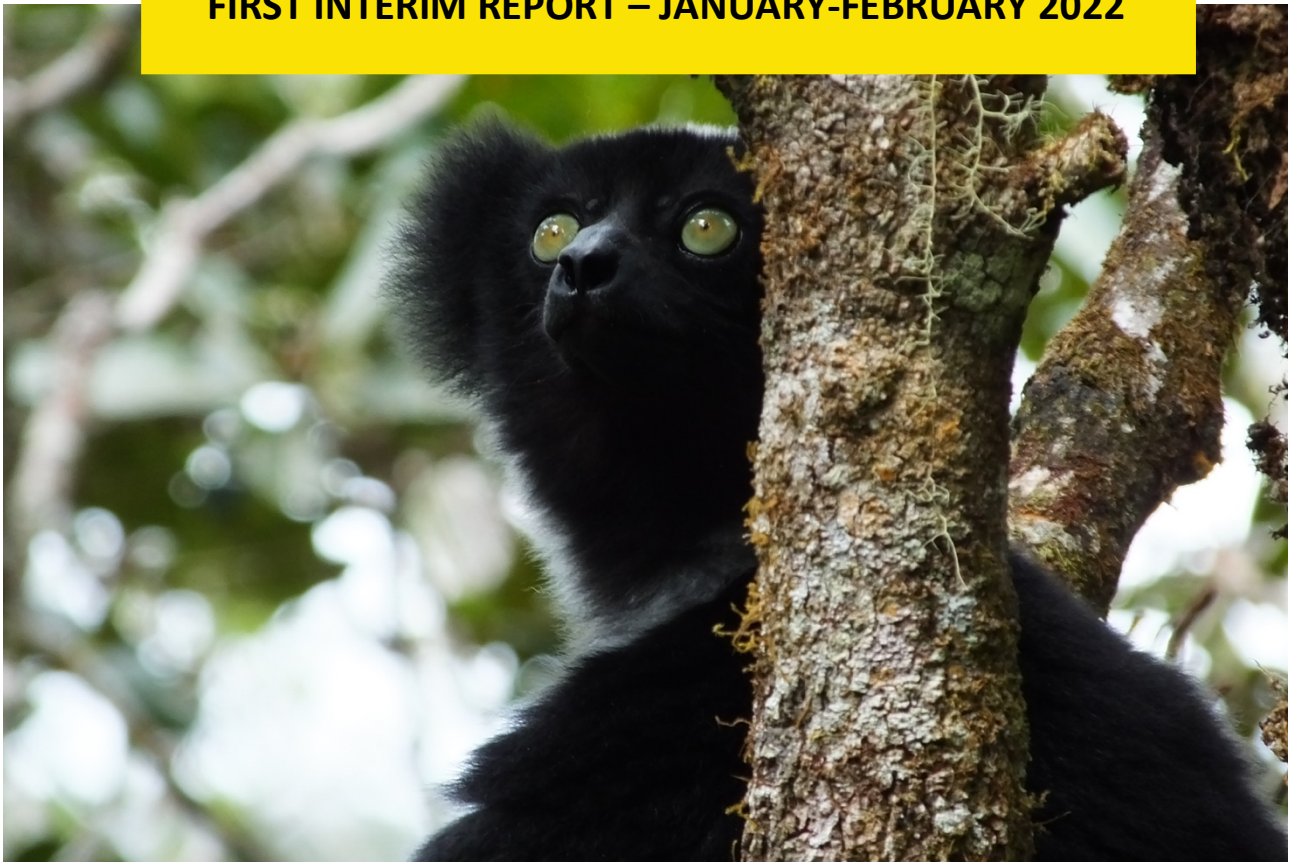


MAROMIZAHA PROJECT

Protecting the singing lemur and its forest

FIRST INTERIM REPORT – JANUARY-FEBRUARY 2022



General information

The project

The staff from the NGO U ONLUS (<https://www.uonlus.it/>), as part of the Ethology and Bioacoustics research group of the University of Turin, Department of Life Sciences and Systems Biology, is currently leading the first and only long-term indri population monitoring. Starting from 2008 we have habituated 12 family groups of *Indri indri* in the Maromizaha NPA. We currently have 4 research guides performing daily surveys on the animals, collecting behavioral and spatial data on each indri group, at individual and group level (no collars, each individual is recognizable thanks to natural marks on its pelage). In addition, a Passive Acoustic Monitoring of the indri population is ongoing, thanks to an array of 2 Wildlife Acoustics SM4 (<https://www.wildlifeacoustics.com/>) and 10 Audiomoth (<https://www.openacousticdevices.info/audiomoth>) recorders.

Threats for the species

The species *Indri indri* is a highly distinctive lemur, endemic to the island of Madagascar where it inhabits the eastern rainforest habitats.

Illegal hunting is a major problem for the indri in certain areas. Although long thought to be protected by local *fadys* (traditional taboos), these do not appear to be universal and the animals are now hunted even in places where such tribal taboos do exist. In 2018, for example, in the Commune of Lakato (Alaotra Mangoro Region), 9 indris were killed by poachers in the Antavolobe forest (Ratsimbazafy, pers. comm.). Recent studies of villages in the Makira Forest indicate that indri have also been hunted in the past for their skins (which were worn as clothing), that indri meat is prized and fetches a premium price, and that current levels of indri hunting are unsustainable (Golden 2005, 2009; Jenkins et al. 2011; R. Dolch pers. comm.). The principal threat to this species is habitat destruction for slash and burn agriculture, logging and fuelwood gathering, all of which take place even within protected areas. Increasing levels of illegal hunting is also a major problem for the indri (Jenkins et al. 2011). Fady against the hunting of indri are becoming less respected, and hunting has thus worryingly increased since the political crisis, now posing a serious threat to this species. The corridors between Mantadia and Zahamena are an important Conservation Site, where wide conservation education and capacity building actions should be implemented, to eliminate hunting, with the indri as the flagship species. This species has never successfully been kept in captivity and thus captive breeding programs are highly doubtful.

In the next years it will be of great importance to support local forest management by improving the existing community-based approach (Randrianarison et al. 2015). Actions should include expansion of protected habitats to increase population connectivity (e.g. the Ankeniheny-Zahamena corridor) and to decrease lemur disturbance by rural communities. Without external support, the last remaining forest habitats will be devastated within a few years resulting in the local extinction of most lemur populations (Schübler et al. 2018).

Thanks to the collaboration between the WSO, Friends of The Earth, Friends of the Sea, U ONLUS, the University of Turin and GERP, the “Maromizaha Conservation Project” will carry out conservation activities targeting the population of indri lemurs in Maromizaha during a one-year project, starting from January 1, 2022.

The “**Maromizaha Conservation Project**” thus aims at protecting the indri lemurs, through two main activities:

1) **Indri population monitoring**

The project will foster conservation by:

- i. Implementing the number indri family group under the actual monitoring protocol;
- ii. Implementing the Passive Acoustic Monitoring population survey;
- iii. Building capacities among the local communities in the domain of biodiversity conservation and education;
- iv. Increasing awareness, facilitating and encouraging people’s involvement in conservation actions in the area.



2) **Habitat Restoration**

This action supports local forest management by improving the existing community-based approach and by expanding the network of protected habitats in the Ankeniheny-Zahamena corridor.



First bimonthly report

For the “**Maromizaha Conservation Project**” the U ONLUS project team selected a contact person in Madagascar, Dr. Rose Marie RANDRIANARISON, member of the Scientific Board of the Maromizaha Multipurpose Center, who is in charge of coordinating the activities in the Maromizaha NPA. Dr. Randrianarison carried out a first mission in Maromizaha from January 31st to February 3rd 2022.

The coordinator’s first bimonthly mission aimed at:

- 1) assessing the flood impact at the site and the damages occurring at the villages following the passage of the ANA and BATSIRAY cyclones;
- 2) coordinating the research guides of the Maromizaha project, collecting data from the last quarter of 2021 and transmitting the new research calendar;
- 3) planning activities for the first year quarter (Jan-Mar 2022) and regulating payments of the salaries of all our staff for the first trimester;
- 4) Regulating payments of scholarships for the academic year 2021-2022 for the selected students;
- 5) assessing of the state of plant nurseries (pepinières) following the passage of the two cyclones.



Flood impact at the site

The impact of the ANA and BATSIRAY cyclones, that hit Madagascar in January and February 2022, was assessed during Dr. Randrianarison first mission to Maromizaha. There were no severe damages at the infrastructures (CRPM, toilets, showers, etc.) or at the equipment (e.g. solar panels, protection devices, etc.) but the local villagers reported considerable impairments to their farmland and fish farms.

Roof

The damage left by Cyclone Ana is mainly on the roof of the Maromizaha Multipurpose Center (CRPM). The CRPM guardian, Zamalava, ensured the safety of the roof by fixing the roof ridges by ropes, to fight against the cyclonic wind.



Solar panels

The solar panel supports were reinforced with square timbers by the other CRPM guardian, Norbert.



Showers and toilets

The shower-toilet units faced no particular damage. The walls and doors were painted after the cyclone by the Norbert. The shower trays get rusty and will be replaced soon.

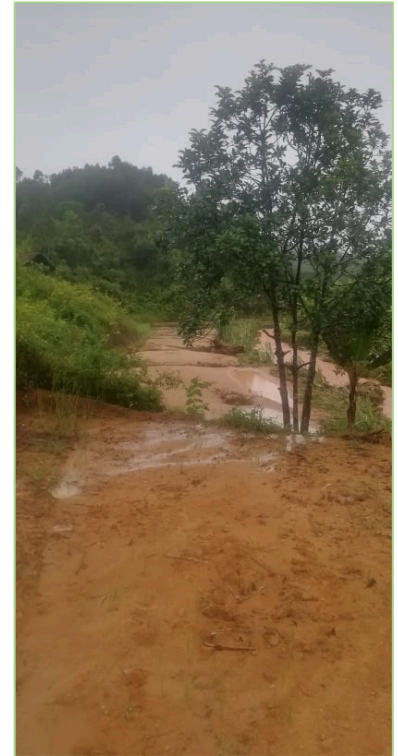
Large room and protection devices

The CRPM main water gutter of the great hall leaked rainwater and a water drain pipe was installed by guardian Zamalava. Lastly, the provision of disinfectant gel and soap took place at the entrance of the CPMR to fight against Covid-19 infection of the staff and the visitors.

Rural communities



The cyclones devastated the drought-hit island's agricultural heartland, leading the UN to warn of a worsening humanitarian crisis. The villagers in the Maromizaha area reported severe damages to their farms, to the agricultural infrastructures and to the fish farms. Luckily, there were no damages at the GERP's tree nurseries, and this will ensure the correct development of the habitat restoration activities foreseen within this project.



Indri monitoring

The “Maromizaha Conservation Project” has a team of 4 research guides monitoring and collecting data on the population of wild indris in the Maromizaha rainforest.

Two guides, Gilbert KOTOARISOA and Jean RANAIVOMANANA (Figure A), are in charge of the survey of 7 habituated groups of indris. The other two guides, Zafison BOTO and Emile Susy RAKOTOARISOA (Figure B) are in charge of the survey of 5 habituated indri groups, of the passive acoustic monitoring (PAM) and of the habituation of new indri family groups.



A



B

The indri monitoring protocol

The indri (*Indri indri*) is the largest extant lemur of Madagascar. Forests inhabited by indris resound each day to loud modulating cries. Threatened by habitat loss and by hunting, this lemur, one of Madagascar's flag species, is currently at risk. The research project undertaken by the University of Turin and its partners is the first long-term study (since 2004) on vocal communication, genetic variability, population dynamics and spatial behavior of indris. Italian and Malagasy scientists and students are investigating these conservation-relevant topics, by adopting multidisciplinary approaches. Knowledge about the natural history of the indri is fundamental to design effective, long-term conservation programs for these really unique primates.

The guides, by themselves or in association with students and researchers, conduct daily follows of groups of wild indris (*Indri indri*), at a yearly basis. On a weekly basis, the study group is switched and the relative territory and forest area are covered by the monitoring. Sessions start at around 6:00 a.m. (depending on the season), as the research group goes out in the forest in search of the indris' sleeping sites. Once the group is reached, a different focal animal is selected and followed each day by the observers. Behavioral, spatial and feeding data are collected, until about 13:30 in the afternoon, when the animals start resting before sleeping. When present, vocalizations and songs are recorded. Each day, temperature and humidity are noted, as well as weather conditions, that are registered within five minutes delayed scans. The group's location is recorded through a Garmin GPS every time the animals move at least 50 meters from a previous location, thus tracking group's daily paths and trajectories.

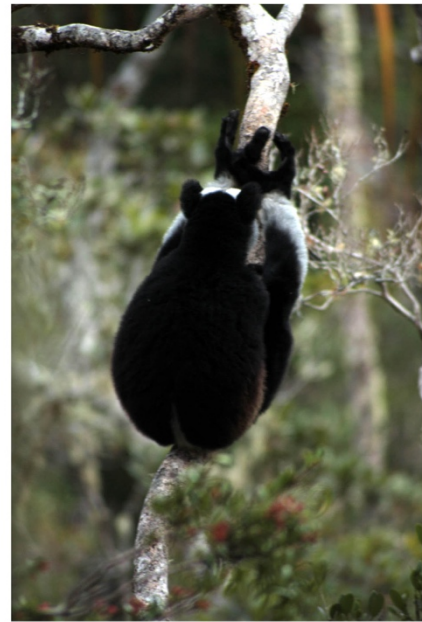
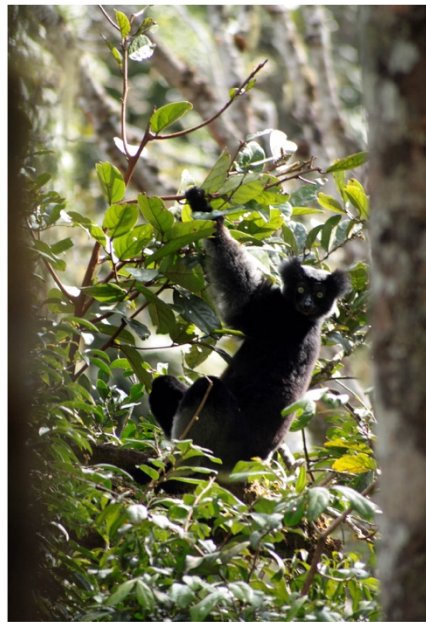
For the PAM we set 2 Wildlife Acoustic Song Meter (SM4) recorders to equip 4 listening in different areas of the NPA (2 sites in the research area, 1 site in the eco-touristic part of the NAP, 1 site in the pristine forest). The 2 SM4 stay in place for three weeks at a listening point and are then moved by the guides in the following point. Both SM4 recorders are configured to record for 10 min every 30 min, with 16 bit recordings made at a frequency of 44,100 Hz and stored in .WAV file format. In 2018 we set up also 10 Audiomoth recorders in 10 different listening points across the Maromizaha NPA. Those recorders stay in place 3 weeks per month, with the same configuration of the SM4 recorders. Unfortunately, the precipitations occurring in the area damaged all the Audiomoth recorders in 2021, and the recording array should thus be replaced within this project.

All the recorders are placed on the tree canopy, at a height of approximately 2.5-4 meters.



Name: Jery - Group: 1MZ - Sex: Male - Age: Adult - Class: Reproductive

In the Maromizaha NPA the 4 research guides follow and monitor a total of 12 indri family groups, whose composition and structure is reported in the annexed table. The research guides are able to identify each individual in each group, thanks to the color of the pelage and to the fur's natural marks. We report here an example of an animal ID profile sheet.



E' un maschio riproduttivo, adulto. Produce duetti insieme a Bevolo. E' facilmente riconoscibile per il colore molto scuro del pelo, sia nella parte dorsale che sul petto. Il triangolo dorsale bianco è molto stretto e screziato di grigio. Le parti bianche del pelo sulle zampe anteriori e posteriori sono anch'esse screziate di grigio-fumo. Il triangolo bianco sul capo presenta due punte poco profonde che scendono sugli occhi, e una macchia scura lineare che solca il triangolo a metà, partendo dalla porzione dorsale. Anche il muso è molto scuro, con un alone poco percepibile più chiaro intorno agli occhi.

At the beginning of January, the 4 Research Guides received the workplan for the first trimester from Dr. Valeria Torti. The planned activities are:

- 1) the survey of the 12 indri groups, in order to collect behavioral, spatial and acoustics data;
- 2) the detailed planning for the SM4 recorders rotation;
- 3) the planning of the calendar for the habituation of 2 new indri groups (starting from March 2022). We will start after March 2022 because of the difficulties to habituate individuals during the cyclone season and to avoid animal stressing during the breeding season.

<i>Indri indri monitoring</i>		
Week	Period	Target group
0	10-24 January	All. Aim: confirming group composition and the presence of the youngest individuals (<1year old).
1	24-28 January	1MZ + 6MZ
2	31 January - 4 February	2MZ + 7MZ
3	7-11 February	3MZ + 8MZ
4	14-18 February	4MZ + 9MZ
5	21-25 February	5MZ + 10MZ
6	28 fev-4 March	1MZ + 11MZ
7	7-11 March	2MZ + 12MZ
8	14-18 March	3MZ + 6MZ
9	21-25 March	4MZ + 7MZ

<i>Passive Acoustic Monitorin (PAM)</i>		
Date	Activity	Location
January, 24	installing SM4 0354	BEOVITRA
January, 25	installing SM4 1064	VONONDROZONA
February, 18	collection SM4 + recharge batteries	
February, 21	installing SM4 0354	AYE AYE
February, 22	installing SM4 1064	PETITE BELLEVUE
March, 18	collection SM4 + recharge batteries	
March, 21	installing SM4 0354	BEOVITRA
March, 22	installing SM4 1064	VONONDROZONA
April, 15	collection SM4 + recharge batteries	

All the data will be transmitted by the research guides to Dr. Randrianarison at the end of March 2022 and successively uploaded to a Google Drive shared folder, for the online backup. Hard disks with the PAM recordings will be sent to Italy once full, as it happened in February 2022 (thanks to the support from Clarissa Puccioni, who brought 2 devices to Italy containing the 2021 PAM recordings).

Rising awareness

Educational activities on indri conservation issues in local schools and study support will enhance in a short term the involvement and the awareness of the cultural and economic value of lemurs and their habitat by children and their families. In the long term, this enhanced awareness gained at a young age, will facilitate and encourage their involvement in conservation and the search for environmentally sustainable job opportunities.

By the end of March 2022, Dr. Randrianarison will organize, under the U ONLUS and UNITO coordination, the first quarterly training session, that will take place at the Maromizaha Multipurpose Center and will be targeted at improving capacities in both all the research and eco-touristic guides of the Association of Local Guides (AGAM).

Scholarships

Every year, U ONLUS, thanks to the support of its partners, provides grants to parents with economic difficulties to support the costs for their children's rents, tuition fees and living costs. The aim is to prevent school dropout and to support students in becoming citizens who appreciate, interpret and conserve the natural and physical environment. All the students who receive scholarships are involved, during the year, in activities targeting the schoolchildren of the Anevoka primary school. In September 2021, the team collected requests (invoices as annexes) for support by the local parents and selected 7 schoolchildren who were granted with a scholarship.

Dr. Randrianarison met the granted schoolchildren and took them to the post office in the Andasibe village, where she opened a savings account each, in which she deposited the amount of the grant.

The awarded students are:

1. RANDRIANOMANANA Tojonirina – 1ère, Lycée Maranatha - total amount: 2.113.500 MGA
2. RAKOTOMALALA Faly Julien – Auto école Harintsoa, Moramanga– total amount: 1.628.200 MGA
3. NAMBININA Julie Lalao Sabrinah - Institute of Arts and Technology, Moramanga - total amount: 1.303.200 MGA
4. ZOLILALAO Nirina Angela – Institute of Arts and Technology, Moramanga - total amount: 1.303.200 MGA
5. NAMBININTSOA Mitoetra Jaidy – Préscolaire EPP Anevoka - total amount: 200.000 MGA
6. Ginah Patricia Violette - 2nde, Lycée Antsapanana Andasibe - total amount: 1.646.400 MGA
7. NIRISON Stella Anjaniaina - CP2, Saint Pierre Paul Andasibe - total amount: 1.646.400 MGA

The students will be considered successful in their school program if they will access to the following education level. They will send their score boards and final exams' results in June/July, after finishing the academic year. The total amount of 2.400 EUR is charged in part on this project (1.700 EUR) and in part to U ONLUS budget. The team decided to award 7 students, in order to match the selected families' needs of having all their children supported in their school programs (all the students belong to 3 different family units).

On the top, from the left: Faly Julien, Tojonirina, Julie Lalao Sabrinah, Nirina Angela.



From the left, Mitoetra Jaidy, Ginah Patricia Violette and Stella Anjaniaina.

Habitat restoration

In order to support local forest management by improving the existing community-based approach and to expand the network of protected habitats in the Ankeniheny-Zahamena corridor the University of Turin supports reforestation actions in the Maromizaha NPA. In collaboration with GERP, the team currently manage 5 bamboo and endemic tree nurseries in the villages around the NPA and support the local population in the ecological restoration of target degraded areas of the forest. The project aims at increasing population connectivity and decreasing lemur disturbance by rural communities. The total budget will support the costs for seed collectors, tree nurseries, tree planters and materials to improve the extension of the restored area within the NPA.



The team, supported by Dr. Randrianarison and by the GERP's local coordinator, Mr. RANDRIAMIALISOA, is currently assessing the status of the tree nurseries after the passage of the cyclones ANA, BATSIRAI and the upcoming EMNATI. The coordinators did not report damages for the Anevoka village tree nurseries, but the other ones should be checked in site, when the National Road 2 will be completely accessible. A team from the University of Turin is planning to go to Maromizaha from March, 2022. The staff will ensure the monitoring of all the nurseries and will coordinate the purchase of materials and the hiring of the planters and nursery keepers.

