

Betampona Nature Reserve

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Madagascar Fauna Group (MFG)

The MFG is an international Non-Governmental Organisation - established in 1988 to contribute to the conservation of Madagascar's endemic wildlife. Comprised primarily of zoo members, the MFG's in-situ programs are funded through the members' annual dues. The MFG's core programme began under the direction of MFG/Duke Primate Centre technical advisors Andrea Katz and Charlie Welch who came to Parc Ivoloïna at the request of the Malagasy government for international assistance in the reconstruction and management of the Ivoloïna Zoo. Since then the objectives of the MFG have broadened to include conservation, environmental education, socio-economic development, forest restoration and the promotion of sustainable agricultural and agro-forestry practices.

In 1998 the MFG became involved with Betampona Nature Reserve when, in partnership with ANGAP (Association National pour la Gestion des Aires protégées) the first of three releases of captive-reared black and white ruffed lemur (*Varecia variegata variegata*) took place at Betampona*. The subsequent follow-up to the releases led to the development of the partnerships and conservation activities that are in effect today.

Betampona Nature Reserve (Réserve Naturelle Intégrale de Betampona)

Betampona is situated approximately 40 km northwest of Toamasina in the eastern Malagasy rainforest belt. Recognized today as one of Madagascar's top biodiversity hotspots, in 1927 the 2228 ha Betampona forest became the first area to receive the designation "Réserve Naturelle Intégrale" or "strict nature reserve". At that time Betampona was part of a much larger fragment of rainforest than it is today. Ranging between 250 and 600 m in altitude Betampona now stands alone – one of Madagascar's last fragments of lowland rainforest - probably saved from deforestation by its extreme slopes as much as by its protected status.



Plate 14. Betampona Nature Reserve.
(© K. Freeman)

For most of the year the climate at Betampona is hot and humid with an annual average humidity of between 81 and 91%. There is no true dry season. Rain can be expected for more than 300 days each year with over 2000 mm falling each year. The average annual temperature is 24°C with annual lows of around 16°C between June and August and annual highs of 32°C possible between December and February.

Betampona's designation means that access is available only to ANGAP and to researchers approved by the Malagasy government. MFG is the main research organisation working at Betampona and is ANGAP's official partner for the management of the site.

The forest, which occasionally still suffers from small-scale illegal wood extraction, remains largely intact, except for past selective logging of precious woods and pressure from

* See ALERT

encroaching invasive plant species. It is home to 11 species of lemur including the black and white ruffed lemur, and the largest of the nocturnal lemurs, the aye-aye (*Daubentonia madagascariensis*). At least 88 species of bird and 70 amphibian species also inhabit the forest along with 67 species of reptile, including the critically endangered gecko *Paroedura masobe* and the prehistoric looking leaf-tailed gecko genus (*Uroplatus* sp.) The reserve shelters countless plant and invertebrate species – many of which are still undescribed. Species new to science are being found every year.



Plate 15. *Paroedura masobe*: Threatened by its value in the illegal pet trade market. (© K. Freeman)



Plate 16. *Liopholidophis* sp.: Potential new species for Betampona. (© K. Freeman)

Betampona has also been described as one of the most florally diverse and important regions of Madagascar (pers. comm. Birkenshaw, Missouri Botanical Gardens) and, as intact lowland rainforest, represents one of the most threatened habitats in the country.

Conservation activities

Today's conservation objectives

The conservation of Betampona's primary forest depends upon the consideration of two areas; the reserve itself and the area immediately surrounding the reserve including the Zone of Protection. The Zone of Protection is a 100 m wide belt of land surrounding the reserve, intended as a buffer between villages and the reserve proper on which the traditional "slash and burn" agricultural practice "tavy" is not legally permitted. It has historically been cultivated by local villagers and continues to be so, so good relations with the local population are vital.

Within the reserve the MFG is carrying out research to increase knowledge of the species present and their distribution to try to establish an idea of the conservation status of each. Conservation management measures can then be taken to protect the oftentimes critically endangered species. Monitoring of the released lemurs continues and valuable data is being collected on population and group dynamics in the black and white ruffed lemurs to help ensure their long-term survival in the reserve.

The reserve itself needs to be protected from invasive plant species, buffeting from cyclones and the illegal extraction of forest products. Seven subsistence-farming dependent villages are located around the Betampona periphery. The importance of developing sustainable, economically viable land practices for these rural communities is accentuated by the close proximity of the primary forest edge. Rapidly expanding village populations and increasing poverty are driving up the demand for land and intensifying the pressure on the forest.

Deforestation up to the reserve's limit has left a sharp primary forest edge, which is regularly buffeted by cyclones, creating gaps. Each time a gap appears invasive plant species colonize it, suppressing native forest regeneration and driving the forest back. In addition, small-scale poaching and illegal timber extraction continue in areas of the forest despite MFG and ANGAP's combined efforts.

The MFG conservation and research objectives are targeted at the reduction of these problems through continuing research and education initiatives for the local populace. Today a talented team of five MFG conservation agents work at the Betampona field-station, Rendrirendry (S017559, E049121), directed by Dr Karen Freeman. Supplemented by Malagasy and international researchers, the fauna research programme has diversified from a largely lemur-based study into a broader programme incorporating birds, small mammals, reptiles, amphibians, fish and invertebrates. The flora programme has built upon the foundations laid by Welch's reforestation trial plots to include research into the management of invasive species and the provision of economically desirable plants at cost price for local villagers. The MFG also collects long-term phenological and meteorological data in the reserve to help monitor long-term trends in population fluctuations.

The findings of all studies conducted by MFG staff and researchers are given to ANGAP so that they can be used in the management and protection of the reserve. In collaboration with ANGAP (who's activities in Betampona are largely financed by MFG) the information obtained from the work of the MFG agents and researchers will be used to plan and direct the following initial conservation based initiatives:

- 1) The management of invasive species, specifically guava (*Psidium cattleianum*) and longoza (*Aframomum angustifolium*).
- 2) The reforestation of the Betampona Zone of Protection using a combination of native trees and non-invasive, economically beneficial exotic trees and shrubs.
- 3) The identification of the need for and implementation of single species conservation projects at Betampona.

Other benefits from the MFG

The presence of the MFG agents at Betampona is a deterrent to poachers and illegal timber extractors. The southern areas of the reserve, which due to the location of Rendrirendry, are frequented far more often by the MFG conservation agents than the northern areas, suffer a far lower level of illegal activity than the northern areas.

There is a small MFG-run plant nursery at Rendrirendry where plants suitable for agro-forestry, forest restoration and sustainable agricultural practices are propagated. The young plants and trees are given or sold very cheaply to villagers in the areas around Betampona. The MFG and ANGAP agents run annual training programmes, reforestation days and environmental awareness campaigns in the villages around Betampona to encourage sustainable land-use and reduce pressure on the reserve.



Plate 17. Reforestation near Betampona organised by MFG and ANGAP.
(© K. Freeman)

Getting to Betampona

Due to its "Réserve Naturelle Intégrale" protected status, Betampona is only open to ANGAP, permitted researchers, MFG staff and funders. Research permits can be obtained from the Ministry of the Environment, Water and Forests via ANGAP. Entry permits for consultants can also be obtained at the discretion of ANGAP.

The first point of contact for gaining authorisation to visit Betampona should be ANGAP, Toamasina. They should be contacted well in advance of the proposed visit (allowing three months in the case of research permits) for the authorisation to be processed.

Once a permit has been obtained a taxi-brousse can be taken, or a four-wheel drive vehicle organised to get to Anosibe, which is about 24 km northwest of Toamasina along the Ivoloïna River. At Anosibe the river must be crossed by boat before taking a taxi-brousse a further 12 km to Fontsimavo. From Fontsimavo, a guide is needed for the 4 km hike up to Betampona. Guides can be organised through the MFG. Seven hours should be allowed for the journey to Rendrirendry from Toamasina.

Betampona's profile was raised internationally by a lemur restocking program, which featured the releases of captive born black and white ruffed lemurs (*Varecia variegata variegata*) from MFG-member zoos in 1997, 1998 and 2001. The objectives of the releases were to improve the genetic viability of the small existing black and white ruffed lemur population at Betampona and to assess the feasibility of utilising captive-bred lemurs to reinforce wild populations. After thorough veterinary screening, the animals were flown to Madagascar and taken to Betampona where they were held in cages to acclimatise them to wild foods and the forest, before being released. A team of seven Malagasy conservation agents, led by British scientist Dr. Adam Britt, closely followed the progress of the released lemurs for five years; less intense but systematic monitoring continues today. The primary goals of the restocking programme were realized – one captive-born pair successfully reproduced in the wild and another two of the released individuals produced offspring with wild-born mates. There were losses due to predation by fossa (*Cryptoprocta ferox*) and some released lemurs proved to be unable to adapt to forest conditions.



