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## An international conservation and research programme for Perrier's sifaka (*Propithecus perrieri* Lavauden, 1931) in northern Madagascar

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† In memoriam

Perrier's sifaka (*Propithecus perrieri*; Fig. 1), one of the most endangered and least-studied lemur species, only remains in a small and already highly fragmented area of dry forest in northern Madagascar. Formerly regarded as a subspecies of *Propithecus diadema*, the taxon was recently elevated to full species status (Mayor *et al.*, 2004). It inhabits the Analamerana Special Reserve and the Andrafiomena hills (Petter *et al.*, 1977; Tattersall, 1982; Hawkins *et al.*, 1990). Whereas the species has once been reported to occur in the Anka-



Fig. 1: Perrier's sifaka (*Propithecus perrieri*).  
 Photo: Russell Mittermeier

rana Special Reserve, Banks *et al.* (in press) as well as Rasoloharijaona *et al.* (2005) did not find it there in 2003/2004. Overall population size is estimated to be between 100 and 1,000 individuals (Mittermeier *et al.*, 2005, 2006; Banks *et al.*, in press). The most recent estimate is provided by Banks *et al.* (in press), who predict that there are 915 black sifakas remaining with an effective population unlikely to exceed 230 individuals. Perrier's sifaka is threatened by hunting, selective logging, habitat destruction to make way for agriculture and pasture for livestock, as well as mining for gemstones. It was assessed Critically Endangered (CR C2aII) at the most recent IUCN Red List assessment in April 2005 on the basis of its very small population size and the continuing decline in numbers. The species was recently found to also occur in a corridor of forest between Analamerana and Ankarana as well as in the Andavakoera Classified Forest. For the latter two areas, protection measures are urgently needed.

In 2005, a group of interested parties headed by the Monaco-based NGO *Act for Nature* and the *Groupe d'Etude et de Recherche sur les Primates de Madagascar* (Université d'Antananarivo) decided to implement a conservation and research programme for Perrier's sifaka in northern Madagascar. The goals of this programme are on the one hand to achieve a sustainable conservation of *P. perrieri* in at least one of the major areas of repartition of the species which are currently without any degree of protection, on the other hand to gain scientific knowledge of *P. perrieri* directly relevant to effectively planning and carrying out such conservation measures. Here, in the first phase of the programme precedence is given to questions relating to the effect of habitat destruction and fragmentation on the species as well as to its feeding ecology.

### Programme objectives

Perrier's sifaka is, alongside the silky sifaka (*Propithecus candidus*), considered to be the rarest sifaka species, and the precise limits of its very small distribution area are not known (Tattersall, 1982; Mayor and Lehman, 1999; Mittermeier *et al.*, 2006), nor its biogeography and chorology which could explain its present limited range. Most of the remaining population is thought to occur in the 34,700 ha Analamerana Special Reserve, situated at 12°44'S and 49°44'E, 36 km south-east of Anivorano-Nord in the autonomous province of Antsiranana (Nicoll and Langrand, 1989; Ganzhorn *et al.*, 1996/1997). However, Banks *et al.* (in press) calculated that 26 % of the total remaining population of *P. perrieri* is found in areas without any protection, particularly in the forest corridor between the special reserves of Analamerana and Ankarana. According to the same authors, one third of these approximately 240 animals are living in forest fragments of less than 1 km<sup>2</sup>. Given the low densities of Perrier's sifakas of 3-4 individuals/km<sup>2</sup> reported by Petter *et al.* (1977) and Banks *et al.* (in press), it is obvious that none of these small fragments can harbour a self-sustaining population of the species. Mayor and Lehman (1999) report that, unlike other sifakas, Perrier's sifakas regularly come to the ground to cross large stretches of savannah between forest patches. It would therefore be of value to the conservation of *P. perrieri* to investigate how well the lemurs are able to utilise the matrix surrounding the forest fragments (matrix-tolerant species; Laurance and Bierregaard, 1997) and to disperse between these fragments.

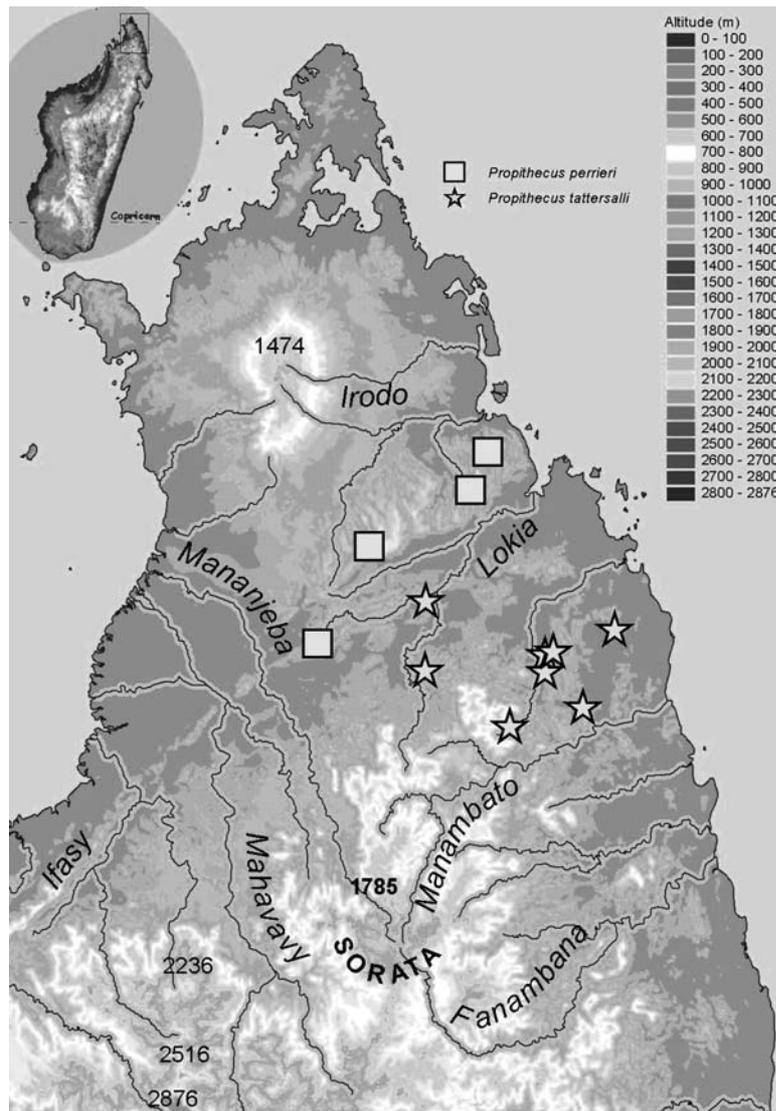


Fig. 2: Distribution area of *Propithecus perrieri* and *Propithecus tattersalli* in northern Madagascar. Map: Lucienne Wilmé

Although Banks *et al.* (in press) provide a reasonable estimate of the remaining *P. perrieri* population, there is, to date, no information on the number of groups and the size of the forest fragments these groups inhabit. Knowledge of these aspects will provide a basis for conservation measures to be carried out on. It will furthermore constitute a first step of a larger study on the effects of habitat fragmentation on Perrier's sifaka.

Perrier's sifaka lives in groups of 2-6 individuals which occupy home ranges of up to 30 ha (Meyers and Ratsirarson, 1989; Mayor and Lehman, 1999; Mittermeier *et al.*, 2006). In their two-month study of 2 *P. perrieri* groups in Analamerana, Lehman and Mayor (2004) found that the sifakas mainly fed on leaves (45-55%), flowers (26-29%) and fruits (15-20%). The two studied groups exploited a total of 28 and 35 different plant species, respectively. Of all recorded activities of the studied animals, 28% were devoted to feeding. So far, no systematic long-term study of the feeding ecology of *P. perrieri* has been carried out. From the conservation perspective it is necessary to study how the animals cope with the destruction of their original food resources and how well they are able to exploit new resources such as second growth plant species generated through edge

effects. The results of such studies can be used to guide reforestation measures and the possible planting of corridors between forest fragments too far apart to allow for dispersal of sifakas.

Regarding direct conservation measures, the main goal of the programme is to prepare everything necessary for the conservation of the yet unprotected parts of the *P. perrieri* distribution area in order to ensure a long-term survival of the species. On the one hand this means the sensitisation of the local communities for ecosystem conservation, on the other hand the planning and coordination of direct development aid measures. In this respect it will be crucial for the programme to directly link as many incomes of the locals as possible to the conservation of the sifakas and their habitat. This can be achieved by employing people as guides or park rangers, but also by enhancing ecotourism or having people plant and manage fruit tree corridors between forest fragments.

#### Implementation

The studies on the effects of habitat fragmentation on *P. perrieri* as well as on the feeding ecology of the species, briefly outlined above, should be part of a long-term action plan for the conservation of Perrier's sifaka in its original habitat in northern Madagascar. Part of this plan is to establish a field research station in one of the major repartition areas of the species that do not yet receive any protection (i.e. the corridor between Ankarana and Analamerana special reserves). The station will be used by both researchers and conservationists concerned with Perrier's sifaka or other projects relevant to species or habitat conservation to be carried out in the area.

Considering the biodiversity and the high degree of endemism within northern Malagasy habitats, the programme described above should be able to promote research and conservation in the entire northern region, including a botanical inventory as well as studies on sociocultural aspects. Special attention will be given to a public awareness component to be emphasized as part of the programme.

The conservation and research programme for Perrier's sifaka was officially launched on March 21, 2006 with a gala ceremony under the patronage of HSH Prince Albert II of Monaco. The establishment of a research station and the onset of the research work are scheduled for mid 2006. Initial funding will be provided by the government of Monaco, Act for Nature, Conservation International, Westfälische Gesellschaft für Artenschutz, Zoologische Gesellschaft für Arten- und Populationsschutz and Jardin Zoologique et Botanique Mulhouse-Sud Alsace.

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## Preliminary survey of lemur density in the semimontane rainforest of Anka, Fort-Dauphin region

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Here we present the first lemur survey conducted in the forest of Anka, a semimontane rainforest area located in the southern sea-side part of the Vohimena Mountains and included in the classified area Tsitongambarika I. The estimated densities of the lemur species encountered during the survey (*Eulemur collaris*, *Avahi laniger*, *Cheirogaleus* spp., *Microcebus rufus*) appear to be at the upper end of the values for the southeastern rainforest and, in some case, similar to the high densities recorded in the littoral forests close to Fort-Dauphin. Knowing the relative density of lemurs in different forest sites of the Fort-Dauphin region can help to understand the complex migration dynamics of predators (fossa) in the area. In fact, from a fossa's perspective, the forests of Andohahela, Anka and Mandena may be part of "meta-forest" since they are able to move from one site to another within their home-range: the fossa may follow a "density gradient" of the favourite preys when prey population falls under a sustainable threshold.

The parcel 1 of Andohahela National Park represents the largest rainforest area in South-East Madagascar and it should be protected from increasing hunting and logging pressure (Fenn, 2003). However, in Andohahela hunting and logging pressures are far from being eliminated, even in the sites controlled by ANGAP (Rasoarimanana, 2005). In this situation, it is of crucial importance to assess the biodiversity value and the human impact on the buffer areas around the national park. While the mountain rainforests are still relatively undisturbed due to their inaccessibility, the semimontane and low-altitude habitats are exposed to higher rates of deforestation and deserve urgent investigation and conservation efforts. Indeed, Cornac *et al.* (2003) detected both recent and older disturbance in the low-elevation part of the Andohahela protected area.

The forest of Anka (Fig. 1) is located in the southern sea-side part of the Vohimena mountains. This semimontane rainforest is included in the classified forest area called Tsitongambarika I. It is connected with the parcel 1 of Andohahela via the Manangotry corridor. Being not officially protected, hunting and logging levels are supposed to be higher compared to the protected areas. However, the two villages of the *fokotany* of Anka established an agreement to manage the forest, thus a partial protection against illegal activities is in progress. No survey had been conducted in the forest of Anka yet. Surveys seemed necessary as people of Anka re-