

MI264 Feeding ecology, habitat preferences and activity budgets of Verreaux's Sifaka, Madagascar

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Verreaux's Sifaka (*Propithecus verreauxi*) is one of the smaller sifakas with a total length of 90-110cm and weight of 3.0-3.5kg (Mittermeier et al., 2010). They live in multimale-multifemale groups, with female philopatry, ranging in size from 2-14 individuals, although the average group size is around 5-6 individuals (Richard, 1985). Verreaux's Sifakas are diurnal and are active from dawn until dusk, although towards the end of the dry season (October and November) activity shows a notable drop at midday (Norscia et al., 2006). The species ranges throughout Southern Madagascar and inhabits a wide range of forest habitats including dry lowland forest, montane forests (up to 1,300m), spiny bush and scrub thickets and riparian forest (Mittermeier et al., 2010). They may also be found in lowland humid forest, but this is less common.

These lemurs are uniquely well adapted to the dry climate and thorny trees which characterise spiny forest. Verreaux's Sifaka are able to leap from trunk to trunk of spiny cactus-like plants of the family Didiereaceae without injury despite the thick covering of hard spines all over the plants. In addition, these lemurs do not need to drink water and can survive severe drought by obtaining water from the cambium of water storing plants. Verreaux's Sifakas are primarily folivorous, specializing in the high quality leaves (high protein to fibre ratio) found in dry forest (Ganzhorn, 1992), but are also known to eat flowers and fruits when available (Norscia et al., 2006; Simmen et al., 2003). Food quality rather than quantity appears to be more important to Verreaux's Sifaka as they often avoid abundance food sources in search of less abundance higher quality foods (Norscia et al., 2006).

Most of the studies of this species have been conducted in the small special reserves of Berenty and Beza Mahafaly where lemurs are densely populated and where the habitats are predominantly gallery forest. The spiny thickets of Ifotaka also contain significant populations of this lemur, but very little is known about the diet, behaviour and population dynamics of Verreaux's Sifaka in this habitat type. Published data relating to population density, reproductive parameters, feeding ecology and ranging patterns vary considerably across field sites (e.g. Mittermeier et al., 2010, Ralison, 2006). In addition, it is not known if lemurs living in different habitat types are equally affected by habitat degradation (Thalman, 2007). Deforestation and habitat degradation is a major concern throughout Madagascar, but is particularly concerning in the Ifotaka region. Consequently, studies of Verreaux's Sifaka populations in varied habitats are vital for the continued conservation of this species.

The aim of this project is to investigate the ranging, habitat preferences, feeding ecology, and activity budgets of Verreaux's Sifaka in the Ifotaka Protected Area and relate these data to the varying levels of habitat degradation observed in the study site. These studies will be useful for the management of the protected area of Ifotaka by improving the understanding of the ecological needs and impacts of habitat disturbance on Verreaux's Sifaka.

Methods

Study Site

Students choosing this dissertation topic will be studying a semi-habituated group of Verreaux's Sifaka (*Propithecus verreauxi*) in the spiny bush thickets of the Ifotaka North Protected Area, close to Port Dauphin in Southern Madagascar. The Ifotaka North Protected Area is located in the heart of the Mandrare Valley and was formally established in January 2006. Unlike the majority of protected areas in Madagascar, the reserve contains villages and areas of agricultural land in addition to the dry forest and the local communities are fully integrated with the reserve management. Data will be collected along 3km long transect lines radiating from the forest field camps (Figure 1). Students will work with a Malagasy counterpart from the Libanona Ecology Centre and a local guide from Ifotaka.

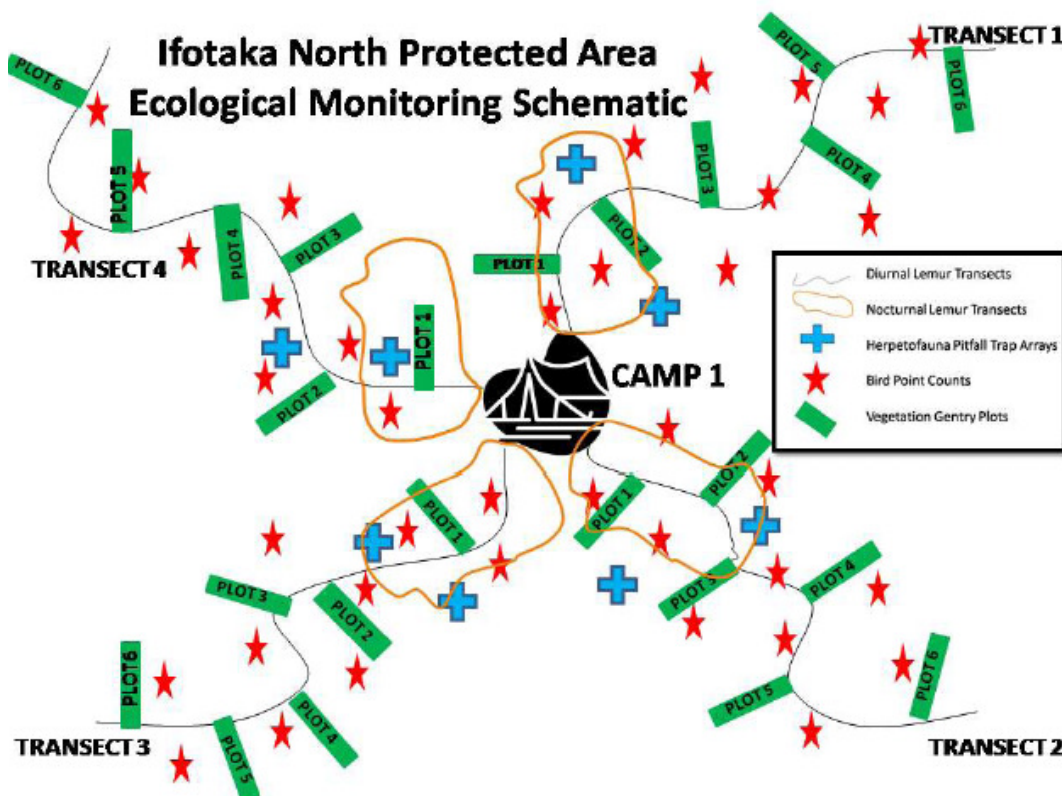


Figure 1: Schematic diagram of Ifotaka monitoring transects.

Data Collection

In order to investigate activity budgets, data is needed from dawn until dusk. However, such long days does not leave sufficient time for data entry and additional data collection such as habitat assessments. Depending on the ease with which the lemurs can be encountered and the length of time they can be followed each day, behavioural observations will either be conducted from dawn until dusk with full days off for data entry and other data collection, or in morning (dawn till midday) and afternoon sessions (midday till dusk) leaving half-day sessions for data entry and other data collection. The GPS location of the group will be recorded throughout the day in order to assess home and day range. Upon locating a group, the number of individuals and age-sex classification of each will be recorded. Ringtailed lemurs (*Lemur catta*) and Verreaux's Sifakas have similar diets (Simmen et al., 2003) so the presence of this species will also be recorded, noting the number of individuals.

Activity data will be collected using instantaneous scan samples (Altmann 1974). You will need to decide on the interval for these scans, either 3, 5, or 10 minute intervals. If you can easily scan the group and record data for each individual within 1 minute, then 3 minute intervals are fine, but if it takes you longer to do this (due to visibility issues or because group members are often spread out) then you need to increase the interval to 5 or 10 minutes to ensure that each scan is independent of each other. For each scan you should record the behaviour (feeding, moving, resting, social, vigilant etc) of each adult individual in the group using a pre-defined behavioural ethogram. When feeding, the type of food (mature leaves, young leaves, fruit, flowers and bark), and corresponding plant species will be recorded where known. Where plants can not be identified in the field, photographs and samples will be taken for later identification. For each scan, the habitat type, predominant plant species, and weather conditions will be recorded.

Additional data can then be collected in order to interpret the findings of the activity and diet data. Habitat surveys could be conducted to investigate forest structure, woody plant composition and to ascertain the level of forest disturbance. Habitat data could be collected using 20m x 20m plots in which the major woody plants are identified, DBH is measured, canopy cover is measured using canopy scopes and evidence of anthropogenic disturbance is recorded. Leaf samples could be collected for subsequent nutritional analysis after the field season although this would require export and import permits (please check with your university).

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