dant l'hiver, ainsi que le cas de *Microcebus* et *Allocebus trichotis* qui ne s'hibernent pas, mais qui peuvent être en torpeur (Martin 1973; Pollock 1979) pendant cette période dans cette aire protégée.
Ces deux types de facteurs ont des impacts négatifs sur les espèces de lémuriens, mais nous avons constaté que la dégradation causée par le passage des cyclones est plus intense par rapport à celle des activités anthropiques, car les grands arbres de cette région n'arrivent pas à résister aux vents violents à cause de la nature du sol et de l'altitude, ils tombent facilement et vont créer par la suite une sorte de chablis ou clairière à l'intérieur de la forêt. Ces restrictions de surface forestière ne fait que diminuer les niches écologiques de ces animaux. Cette situation serait néfaste à la vie des animaux, comme *Varecia variegata rubra* qui choisit de préférence les grands arbres à hauteur élevée comme substrat.

Conclusion
Les facteurs anthropiques (défrichement de la forêt, pratique de tavy, pièges) et les passages cycloniques sont les deux principaux facteurs écologiques qui bouleversent la diversité spécifique de lémuriens dans les différents sites de l'aire protégée de Makira. Ces facteurs provoquent la destruction des habitats et perturbent les niches écologiques de ces animaux. Ces destructions pourront entraîner soit la migration, soit la disparition des espèces. En effet, parmi les espèces de lémuriens connues dans l'air protégée de Makira: *Propithecus candidus*, *Varecia rubra*, *Eulemur fulvus fulvus*, *Cheirogaleus crossleyi*, *C. major*, *C. ravus*, *C. sibreei*, *Allocebus trichotis* et *Daubentonia madagascariensis* sont les plus sensibles aux perturbations d'origine humaine et climatique tandis que *Indri indri*, *Varecia variegata subcincta*, *Hapalemur griseus*, *Eulemur albifrons*, *Eulemur rubriventer*, *Avahi laniger*, *Lepilemur seali* et *Microcebus mittermeieri* semblent résister et s'adapter aux changements brusques de leurs habitats.
Dans le cadre de la conservation des lémuriens de la forêt de Makira, l'atténuation de l'impact des facteurs anthropiques nécessite un développement d'une campagne de sensibilisation et d'éducation environnementale à l'intérieur et aux environs de cette de forêt et ceci en partenariat avec les autorités locales et les institutions techniques.

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Distribution and conservation status of *Mirza zaza*

Mathias Markolf[2], Peter M. Kappeler[1,2], Rodin Rasoloarison[2]

[1]Institute of Zoology & Anthropology, Georg-August University of Göttingen, Berliner Str. 28, 37073 Göttingen, Germany, **mmarkolf@web.de**
[2]German Primate Center, Kellnerweg 4, 37077 Göttingen

The recently described Northern giant mouse lemur, *Mirza zaza* is currently listed as data deficient in the IUCN Red List. We conducted nocturnal surveys to determine the distribution of this species along the northwest coast of Madagascar. Combining results of these surveys and recent reports in the literature, it appaers that *Mirza zaza* only occurs in isolated forest patches between the Mahavavy river in the north and the Maeverano in the south. Given this limited distribution and low densities in fragmented forests, the Northern giant mouse lemur should be classified as "threatened".

The island of Madagascar is a global hotspot for biodiversity and conservation (Myers *et al.* 2000), not the least because of its endemic primate radiation. To develop effective conservation action plans for the maintenance of Madagascar's lemurs, basic knowledge about abundance and geographical distribution is required, which is still lacking for many taxa. This is also true for the genus *Mirza*.

The distribution of the genus *Mirza* is restricted to western dry deciduous forest. *Mirza* shows a highly disjunctive distribution with a gap of up to several hundred kilometers between northern and southern populations. Until 2005, the genus *Mirza* GRAY, 1870 was only represented by a single species- Coquerel's dwarf lemur, *Mirza coquereli* (Grandidier, 1867). A comparison based on morphological, behavioral and genetic data of *Mirza* individuals from Kirindy forest with individuals from Ambato revealed that these populations are distinguishable at the species level. Therefore Kappeler *et al.* (2005) described the northern *Mirza* from Ambato as a new species, *Mirza zaza* KAPPELER and ROOS, 2005.
Mirza coquereli is known to occur between the Parc National de Bemaraha and the Parc Zombitse-Vohibasia. Additionally, single personal observations indicated its presence in the Andranomena Special Reserve, the Tsingy de Bemaraha National Park (Kappeler 2003) and also in the Tsingy de Namoroka National Park (Mittermeier *et al.* 2006). In the case of the newly described *M. zaza*, only little locality information is available. Type specimens come from the Sambirano region in northern Madagascar, specifically from "Pasindava" on the Ampasindava Peninsula and from Ambato. Moreover, C. Schwitzer reported (confirmed by genetics) that *M. zaza* is also present in the Ankarafa Forest of the Sahamalaza region (Mittermeier *et al.* 2006). Randrianambinina *et al.* (2003) described sightings from census walks of individuals of *M. coquereli* in the Mahalaka forest and Randriatahina (2004) reported individuals of *M. coquereli* in the Ankarafa forest and in Andranobe and Ambendrana.
Because these latter reports were made before the description of *M. zaza*, it is possible that these individuals also belong to this species and not to *M. coquereli*, or that sympatric distribution is likely at these sites. In fact, we know almost nothing about the distribution and abundance of *M. zaza*, except for one small population at Ambato. *Mirza zaza* is curently listed as "data deficient" in the IUCN Red List, but given the fact that *M. coquereli* is listed as vulnerable, *M. zaza* must be considered at least as "threatened" and could also be "endangered" (Mittermeier *et al.* 2006; Roos and Kappeler 2006). To obtain more information on the distribution and abundance of *M. zaza* we therefore conducted surveys in north-western Madagascar.

Methods
We visited five localities in north- western Madagascar. The first locality was the type specimen locality near Ambato to reassess densities in an already investigated area. Further to the south, we conducted surveys at Ankiabe and Andranobe near Befotaka and in the Sahamalaza region at Ambendrana and the Ankarafa forest. Locations are indicated in Figure 1.
Because we were not able to walk straight line transects, this reduces the statistical power for the calculation of population density to the measurement of encounter rates (individuals seen per km). All lemurs were discriminated to the species level, if possible. In the case of *M. zaza* this was almost always possible, because of its much greyer fur and the pronounced tip on the tail in comparison to *Mirza coquereli*. Transects were conducted by two observers in October and November 2007.

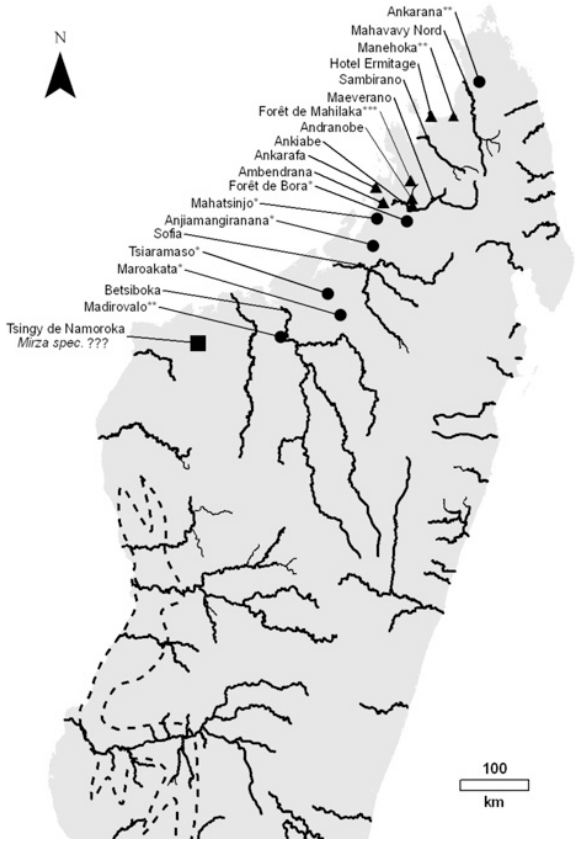

Fig. 1: *Mirza* distribution map. Note that *Mirza zaza* is known to occur only between the rivers Mahavavy nord and Maeverano.
Triangles= *Mirza zaza* present, circles= no *Mirza* present, squares= unknown species, black lines= rivers, dotted line= Range of *Mirza coquereli*, asterisks show surveys of other authors, *Olivieri *et al.* (2005), **Rasoloharijaona *et al.* (2005), ***Randrianambinina *et al.* (2003)

Results
In the following we give a short description of each site. Encounter rates are listed in Table 1.
Ambato Peninsula (*Hotel Ermitage Plage*): This is the site where Kappeler *et al.* (2005) found the type specimen for the description of *Mirza zaza*. It was already described as highly degraded forest of only about 4 ha in size with a lot of mango trees. Kappeler *et al.* (2005) estimated a density of 1086 ind/km^2. When we visited this site, we found almost no remaining forest, making transect walks impossible. Nevertheless, during a short night walk around the remaining trees (mostly mango-trees) we discovered four *Mirza zaza* individuals within 20 minutes. But due to the destruction of the habitat, the local extinction of *M. zaza* it is only a question of time.
Ankiabe: We spent two nights at Ankiabe. The remaining forest cover near Ankiabe runs approx. 4-5 km along one side of a hill that surrounds a feeder river of the Maeverano. It is already highly degraded, which was most obvious by great patches of small shrubs and grass. The ground here was impassable because the hill is very steep and the ground was mostly covered with loose rocks. We only saw a few individuals of *M. zaza* at this site.

Table 1: Encounter rates (ind./ km) for various lemur species at four sites in NW-Madagascar.

Location	Geographical coordinates	transect length (m)	*Mirza zaza*	*Microcebus* spec.	*Lepilemur sahamalensis*	*Cheirogaleus* spec.	*Microcebus sambiranensis*	*Cryptoprocta ferox*	*Eulemur macaco*	Not identified
Ankiabe	S14°37"24.7' E48°15"26.1'	1729	1.2	3.5	0.0	0.0	0.6	0.6	0.0	1x Mz, Ch ?
Adranobe	S14°31"37.2' E48°15"03.3'	1246	15.2	0.0	0.0	0.0	0.0	0.0	0.8	1x Lepi ?
Ambendrana	S14°35"20.4' E47°51"41.1'	2103	3.3	0.0	0.0	0.5	0.0	0.0	1.0	2x Mz, Ch ?
Ankarafa	S14°22"49.3' E47°45"27.6'	3876	0.3	0.0	4.1	1.0	0.0	0.0	*	1x Mz, Ch ?

If it was not possible to identify the species, we listed the genus. If it the genus was unclear, we listed this in the row "Not identified" and propose possibilities. Mz= *Mirza* spec., Ch= *Cheirogaleus* spec., Lepi= *Lepilemur* spec., * we did not count this species, because detailed information about density can be obtained from scientists of the AEECL field station.

Andranobe: The remaining forest at Andranobe was very similar to Ankiabe. As in Ankiabe, we could see the beginning and the end of the forest when approaching the site by foot. The forest is also highly degraded, but in contrast has a large number of mango trees. Here we counted most individuals and could also observe five animals that left together a nest, supporting similar observations by Kappeler *et al.* (2005) at Ambato.

Ambendrana: The forest near Ambendrana also runs along a small riverbed. Again the degree of forest degradation and the number of Mango trees was high. It was previously unknown, whether *Mirza zaza* is present at this site. We counted the second highest number of individuals here.

Ankarafa: Ankarafa forest was by far the most natural forest of the five sites, although it includes primary and secondary forest fragments. The primary and secondary forest fragments are separated by a small savannah-like area of less than one km^2 (Schwitzer *et al.* 2007). We stayed for five days at the AEECL (Association Européenne pour l'Etude et la Conservation des Lémuriens) field station, where C. Schwitzer already reported the presence of *Mirza zaza*. First, we surveyed the smaller primary forest area, which looked like a perfect habitat for Cheirogaleids, because of dense vegetation with many lianas. We saw only two *Cheirogaleus* during the first three nights and only heard one *Mirza* calling during the second night. After approaching this vocalization, we were also able to see the individual and identify it as *Mirza zaza*.
Because we heard *Mirza* vocalizations within the camp during the third night, we continued our survey in the camp area, which is a stronger degraded, secondary forest with many mango trees. While waiting for dusk at a nest, we could see three individuals of *Mirza zaza*. But again, walking transect afterwards did not reveal any detection of *Mirza*, neither visually nor acoustically. Another species seen frequently was *Lepilemur sahamalensis*.

Discussion
Mirza zaza was found in all localities visited. Highest encounter rates were obtained in Andranobe and Ambendrana, both of which showed a high degree of forest degradation together with a high denisty of mango trees. This observation indicates that mango trees may be an important resource for *Mirza zaza* or that this correlation is a secondary effect of forest degradation. These clumped resources may also influence their social behavior and detectability. Two independent observations from two different localities confirmed that *Mirza zaza* sleeps not solitarily and shows more social interactions than *Mirza coquereli*. As already argued in Kappeler *et al.* (2005), it seems not likely that this type of sociality is just the result of high population densities because in Ankarafa, where we had the lowest encounter rates of all sites, we could also observe three individuals visiting together a nest at the beginning of the night. Their social behavior had consequences for our surveys and the estimation of population densities. *Mirza zaza* was found to vocalize a lot, in particular at the beginning of the night, which alerts observers to the direction of the animal, and thus probably enhances encounter rates. Encounter rates for *Mirza coquereli* in Kirindy (Ganzhorn 1995) were at 0.2 individuals per km in 1990/1992, a value lower than our smallest value from Ankarafa. Thus, it seems that density of *M. zaza* is generally higher, maybe because of its more frequent social interactions.
At the time being, we know that *Mirza zaza* is still present at the Ambato Peninsula, Ankarafa, Ambendrana, Ankiabe and Andranobe (Fig. 1). Additionally *Mirza coquereli* (before the northern population was given the species status*)* was found in the Forêt de Mahilaka (Randrianambinina *et al.* 2003), which lies between our visited localities and between Ambanja and Ambilobe near Manehoko (Rasoloharijaona *et al.* 2005). These animals are most likely also *M. zaza* and not *M. coquereli*. Randrianambinina *et al.* (2003) and Olivieri *et al.* (2005) surveyed several localities in the "Province de Mahajanga" more to the south, for example in the Reserve Naturelle de Manongarivo, Reserve Naturelle de Bora, the Parc National d'Ankarafantsika, but found no *Mirza* individuals. Thus, according to the currently available information, the range of *Mirza zaza* is restricted from Manehoko in the north to Ankiabe in the south. If this is true, the Maeverano River probably serves as barrier for *M. zaza* in the south and the Mahavavy in the north.
The distribution of *Mirza coquereli* is much more widespread, ranging probably from the Parc Nationale des Tsingy de Namoroka in the north to the Onilahy river in the south (Mittermeier *et al.* 2006), even though its distribution is also best described as patchy, which again reflects the forest fragmentation throughout the western dry forests (Mittermeier *et al.* 2006). The northern limit is still uncertain, because we still lack information about *Mirza* individuals from the Parc Nationale des Tsingy de Namoroka, whereas we could confirm with genetic data that an individual from the Reserve Naturelle des Tsingy de Bemaraha was a *Mirza coquereli.*

Thus, the range of *Mirza coquereli* is extended to the north of the Tsiribihina river. Because there is no indication for the presence of *Mirza zaza* between the Betsiboka and the Maeverano rivers, it seems more plausible that *Mirza coquereli* is found up to the PN Tsingy de Namoroka (see Fig. 1). Additional survey work between the Betsiboka and the Menambolo rivers is needed to address this question.

Mirza coquereli, which is listed as vulnerable in the IUCN Red List, is still found in larger forest areas, such as the Kirindy-Ambadira forest in Menabe Central, where more than one population can exist simultaneously. In general, few fragments of western dry deciduous forest in Madagascar are greater than 800 ha (Smith 1997; Ganzhorn *et al.* 2001). A recent population genetic study of a *Mirza coquereli* population in Kirindy/CFPF (Markolf *et al.* subm.) indicates that a forest of this size (i.e., >10.000 ha) is the minimum size to maintain genetic diversity in this species. Because Ankarafa forest is the only protected area within the range of *M. zaza*, more scientific work on the degree of genetic divergence and the potential of inbreeding of their small fragmented populations is indicated.

Conclusions

The results of our field surveys indicate that the range of *Mirza zaza* is limited to only a few, mostly highly degraded forests in northwestern Madagascar. Even though individuals are regularly seen together, population densities are low at all of these sites. Because these sites also represent fragmented forests, *M. zaza* should be classified as "threatened" based on the available information about their distribution and abundance.

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Preliminary inventory of lemurs at ten Priority Sites for Plant Conservation

Andriamandranto Ravoahangy, Hubert E. Andriamaharoa, Linah A. Randrianaina, Angelos T.S. Josso, Jeannie Raharimampionona, Christopher Birkinshaw

Missouri Botanical Garden, Madagascar Conservation Program, PO Box 3391 Antananarivo (101), Madagascar, tsilaitra@gmail.com

In 2003, at the World Parks Congress in Durbin, the President Ravalomanana declared that Madagascar would triple the area managed primarily for conservation (Ravalomanana 2003). This represented a never-to-be-repeated opportunity to improve the conservation of Madagascar's rich, unique and highly threatened biodiversity. Missouri Botanical Garden (MBG) responded to this challenge by analyzing botanical information to identify 76 Priority Areas for Plant Conservation (PAPCs) and is currently facilitating the designation of four of these sites as New Protected Areas. In addition, in 2006, MBG obtained funding from the Goldman Fund to select and designate an additional five PAPCs as New Protected Areas. These five sites will be selected from ten PAPC that were chosen mainly on the criteria that they had not attracted the interest of other conservation organizations (i.e. "orphan sites") and that their environmental profile was poorly represented in the exist-