

# Effects of human disturbance on the mongoose lemur *Eulemur mongoz* in Comoros: implications and potential for the conservation of a Critically Endangered species

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## SUPPLEMENTARY MATERIAL 1 Categorization of habitat types.

Dense forests with closed canopy, where moss and lichen were abundant on trees, were categorized as natural forest. Forests of this type are not easily accessible and show little trace of human impact. We categorized forests where native tree species were accompanied by non-native trees or by crops as degraded forest. These forests are also characterized by a closed canopy but are subject to some human impacts (selective logging, wood charcoal production or livestock grazing). Plantations have a forest-like structure but are dominated by human activities and by the presence of agroforestry species such as mango *Mangifera indica*, banana *Musa* sp., clove *Syzygium aromaticum* and papaya *Carica papaya*.

## SUPPLEMENTARY MATERIAL 2 Educational activities and interviews.

We considered whether a survey area was involved in the Progeco (Programme de gestion durable de la zone côtière) environmental education programme focused on ecological services, marine biodiversity conservation and waste management, operated by the authorities of the Marine National Park of Mohéli or by the Ouallah association (this proved true for people living near sites M1, M4, M6 and M7; Table 1).

During August–October 2012 we conducted 59 interviews to investigate whether respondents had direct encounters with lemurs, the attitudes of local people towards lemurs, and the values that they attribute to them. We interviewed local people >16 years old, whom we met along the seven transect surveys on the island of Mohéli and the eight transects on Anjouan. To ensure independence of opinions, when we met a family only one person from the group was interviewed. When walking along the transect we promoted a positive relationship with community members by introducing ourselves and our institutional affiliations, by describing our interest and finally by asking them if they agreed to be interviewed on a private one-to-one basis. Interviewees were informed that their participation was anonymous and no identification code would be utilized, they were free not to answer questions they did not like and they could interrupt the interview at any time. Interviews were conducted only after we received verbal consent. Two people refused to participate in the interview, because they had to return home.

BN conducted the interviews in Comorian, to ensure full mutual understanding. The questions were as follows:

- (a) Have you ever seen the mongoose lemur?
- (b) Is it currently easy to see this species?
- (c) When is the best time to see *Eulemur mongoz*?
- (d) Do you usually throw stones at the animals to scare them away?
- (e) Do you traffic in lemurs?
- (f) Do you capture lemurs for domestication?
- (g) Do you eat lemurs?
- (h) Are lemurs a threat to crops of fruit? If yes, for which fruit species?
- (i) Do you know that lemurs are protected by law?
- (j) Is it important to protect lemurs?

BN also provided a definition of traffic and domestication, to receive more accurate information. Domestication was defined as owning a lemur in semi-natural conditions or in captivity, and traffic as selling lemurs captured in the wild. We asked whether they domesticated or trafficked in lemurs only if respondents voluntarily admitted that these practices existed in the area. We interviewed 54 men and five women, aged 16–70 years (mean  $43.3 \pm \text{SD } 15.99$ ). Respondents were categorized according to age ( $n_{(<30)} = 14$ ;  $n_{(31-50)} = 25$ ;  $n_{(>50)} = 20$ ), occupation ( $n_{(\text{students})} = 11$ ;  $n_{(\text{farmers})} = 40$ ;  $n_{(\text{teachers})} = 8$ ) and island of provenance ( $n_{(\text{Mohéli})} = 25$ ;  $n_{(\text{Anjouan})} = 34$ ).

SUPPLEMENTARY MATERIAL 3 Results of surveys for the mongoose lemur *Eulemur mongoz* on the islands of Grand Comore, Anjouan and Mohéli.

*Grand Comore* During 10 days we found four groups of pet mongoose lemurs (five males and seven females) and two individual domesticated males, in the surroundings of Moroni. These data were not included in the statistical analysis because the lemurs were semi-captive and the person responsible for them admitted that they had been bought in Anjouan or Mohéli, confirming the common practice of lemur trafficking.

*Anjouan* During 17 survey days we made direct observations of *Eulemur mongoz* at eight sites, where we calculated a relative abundance of 1.67 individuals per km. We observed 97 individuals in total (40 males, 45 females and 12 young) along 58 km. Sixty-one individuals were recorded at low elevation ( $<250$  m) and 36 at high elevation ( $\geq 250$  m).

*Mohéli* We recorded a total of 117 individuals (60 males, 51 females and 6 young) during 17 survey days over 72.50 km, and calculated a relative abundance of 1.61 individuals per km. We excluded a group of 12 vocalizing individuals from the quantitative analysis because we were not able to determine their sex or age.

TABLE S1 All tested generalized linear models examining factors that significantly affected (a) group size, (b) numbers of adult and subadult male and (c) numbers of adult and subadult female mongoose lemurs *Eulemur mongoz* on the islands of Anjouan and Mohéli (Fig. 1); models were run for 63 survey groups and are ordered by rank according to AICc. The best models (i.e. having the lowest AIC, or separated by  $AIC < 2$ ) are indicated in bold.

Models	AICc
<b>(a) Group size</b>	
<b>Elevation + Habitat types + Illegal activities</b>	<b>168.42</b>
Elevation + Habitat types + Illegal activities + Logging + Livestock	169.53
Elevation + Habitat types + Illegal activities + Educational activities	170.36
Elevation + Illegal activities	172.94
Elevation + Habitat types + Illegal activities + Charcoal production + Livestock + Educational activities	173.09
Elevation * Habitat types * Illegal activities	178.17
Elevation + Habitat types + Logging	180.05
Elevation + Logging + Charcoal production	184.59
Elevation * Habitat types * Illegal activities * Educational activities	186.14
Illegal activities + Logging + Charcoal production + Livestock	188.24
<b>(b) Males</b>	
Elevation + Habitat types + Illegal activities + Charcoal production + Livestock + Educational activities	87.56
<b>Elevation + Habitat types + Illegal activities + Educational activities</b>	<b>88.00</b>
Illegal activities + Logging + Charcoal production + Livestock + Educational activities	90.52
Elevation * Habitat types * Illegal activities * Educational activities	90.69
Elevation + Habitat types + Illegal activities + Logging	91.29
Illegal activities + Educational activities	92.42
Elevation + Habitat types + Illegal activities	93.45
Elevation * Habitat types * Illegal activities	94.78
Elevation + Habitat types + Logging	102.17
Illegal activities + Logging + Charcoal production + Livestock	104.74
<b>(c) Females</b>	
<b>Elevation + Habitat types + Illegal activities</b>	<b>99.35</b>
Elevation + Habitat types + Illegal activities + Logging + Livestock + Educational activities	99.37
Elevation + Habitat types + Illegal activities + Charcoal production + Livestock + Educational activities	100.50
Elevation + Illegal activities	102.79
Elevation + Habitat types + Illegal activities + Educational activities	103.40
Elevation * Habitat types * Illegal activities	106.55
Illegal activities + Logging + Charcoal production + Livestock	113.68
Illegal activities + Logging + Charcoal production + Livestock + Educational activities	114.95
Illegal activities + Educational activities	119.63
Elevation + Habitat types + Logging	180.05

TABLE S2 Perceived damage to plant species by mongoose lemurs, expressed as the percentage of interviewees that declared that the lemurs eat the fruits or flowers of the species on Anjouan and Mohéli islands (Fig. 1).

Species	Local name	% interviewees	
		Anjouan	Mohéli
Banana <i>Musa</i> sp.	Triedri	91	100
Mango <i>Mangifera indica</i>	Myembé/M'manga	95	89
Papaya <i>Carica papaya</i>	Mpapwayi/Mpapoiri	41	44
Lychee <i>Litchi chinensis</i>	Letchi	45	0
Kapok <i>Ceiba pentandra</i> <sup>1</sup>	Mpambafouma	9	0
Avocado <i>Persea americana</i>	Mbonobo /Mzavuka	27	22
Breadfruit <i>Artocarpus altilis</i>	Mvouriapa/Mfourriapa	23	56
Jackfruit <i>Artocarpus heterophyllus</i>	Mfanassi/Mfenessi	27	0
Pigeon pea <i>Cajanus cajan</i>	Ntsouzi	27	22
Guava <i>Psidium guajava</i>	Mpwera	14	11
Orange <i>Citrus sinensis</i>	Mtroundra	18	33
Pineapple <i>Ananas comosus</i>	Nanassi	14	0
Tambourissa <i>Tambourissa</i> sp. <sup>1</sup>	Mboeza/Mledjeza	18	11
Passion fruit <i>Passiflora edulis</i>	Grenadelle	18	0
Cacao <i>Theobroma cacao</i>	Cacao	9	22
Clove <i>Syzygium aromaticum</i> <sup>2</sup>	Mkarafou	14	0
Tamarind <i>Tamarindus indica</i>	Mouhajou	0	11
Ylang-ylang <i>Cananga odorata</i> <sup>1</sup>	Ylangy langy	0	22
Mandarin <i>Citrus reticulata</i>	Mandarine	9	22

<sup>1</sup>Lemurs consume flowers.

<sup>2</sup>Lemurs consume mature fruit.