

# 6<sup>th</sup> European Federation for Primatology Meeting

XXII Italian Association of Primatology Congress

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## Habitat use of the endangered *Lepilemur mittermeieri* – Northwest Madagascar

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Bristol Zoological  
Society  
Saving Wildlife Together



Gembloux Agro-Bio Tech  
Université de Liège

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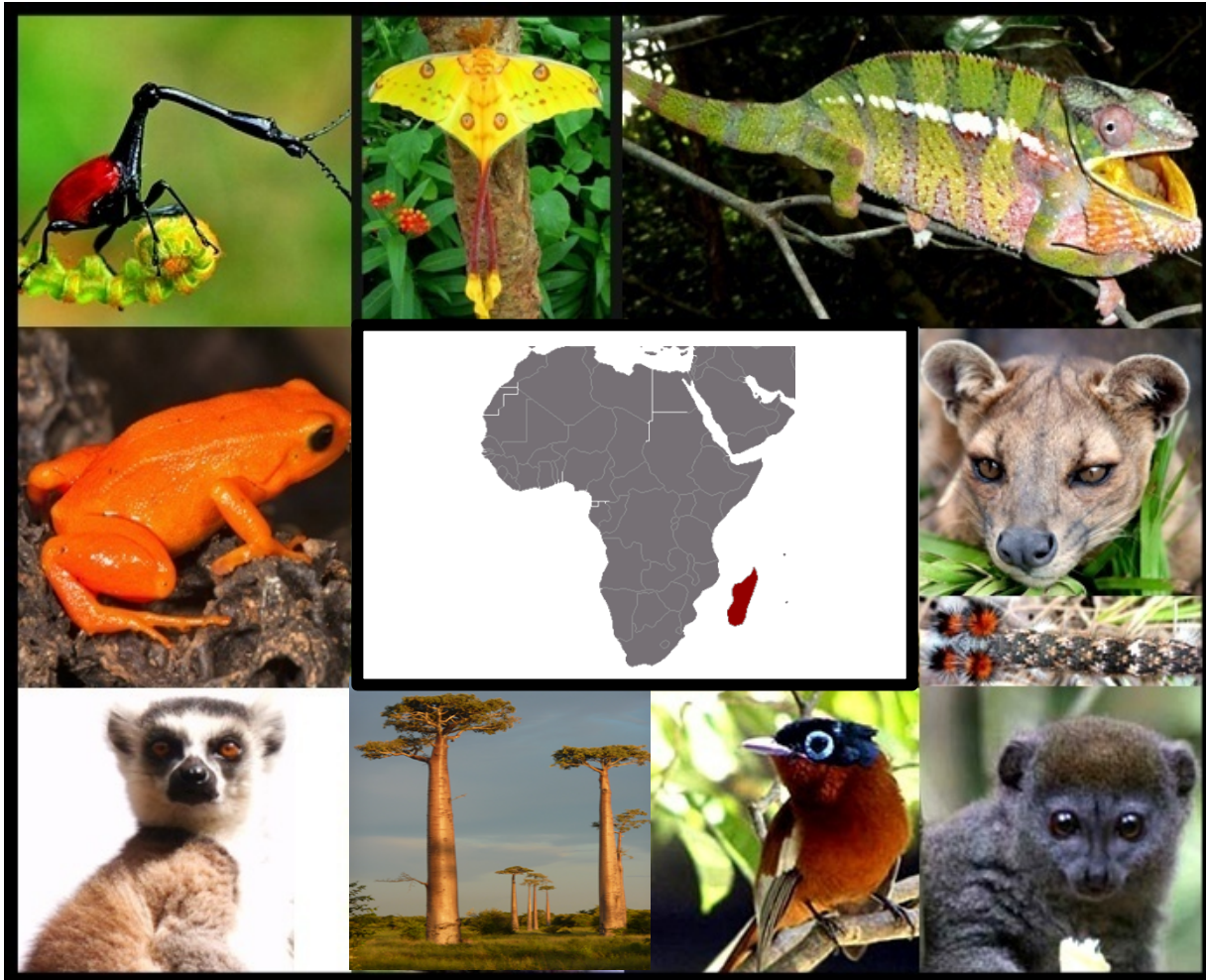
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# Madagascar

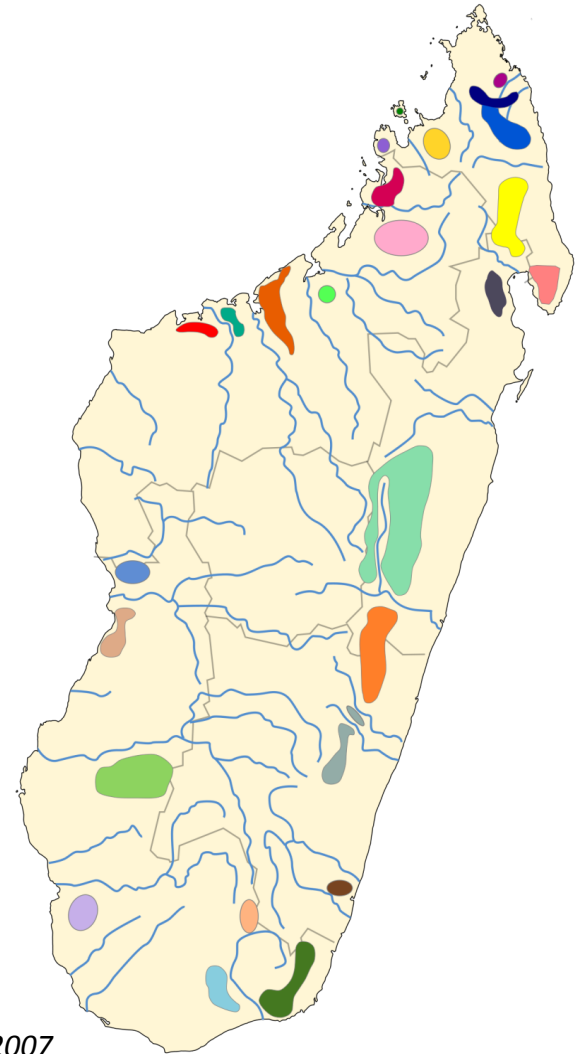
⇒ High biodiversity  
⇒ High endemism

} **Hotspot**



## Genus *Lepilemur*

- ✓ 26 species
- ✓ Mainly folivorous, nocturnal
- ✓ Small area of distribution
- ✓ Exclusively arboreal



Craul *et al.*, 2007

## Genus *Lepilemur*

- ✓ 26 species
- ✓ Folivorous, nocturnal
- ✓ Exclusively arboreal
- ✓ Small area of distribution



**LEPILEMUR**

## Threats

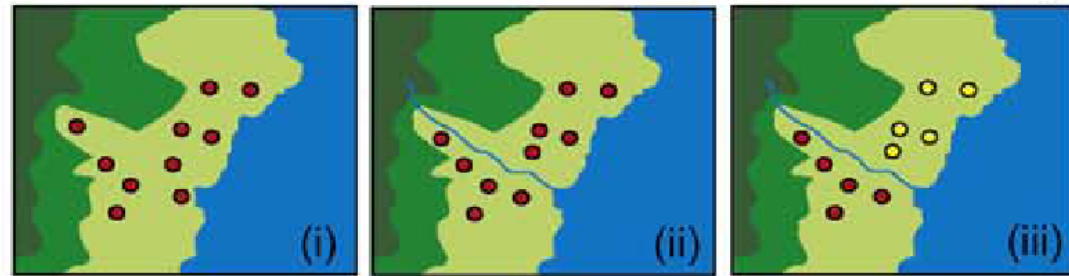
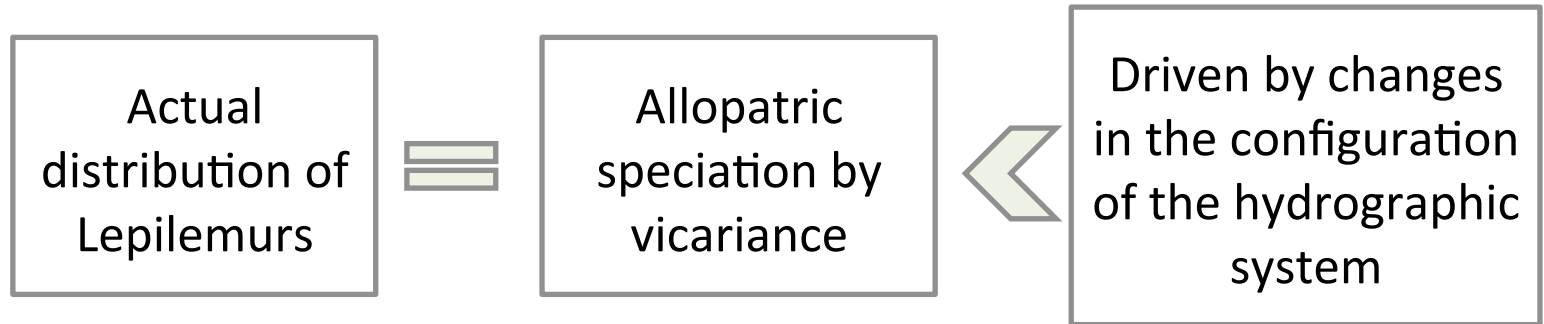
- Human-caused disturbances:
- ✓ Poaching
  - ✓ Destruction and fragmentation of natural habitat



**Threatened of extinction (IUCN)<sub>5</sub>**

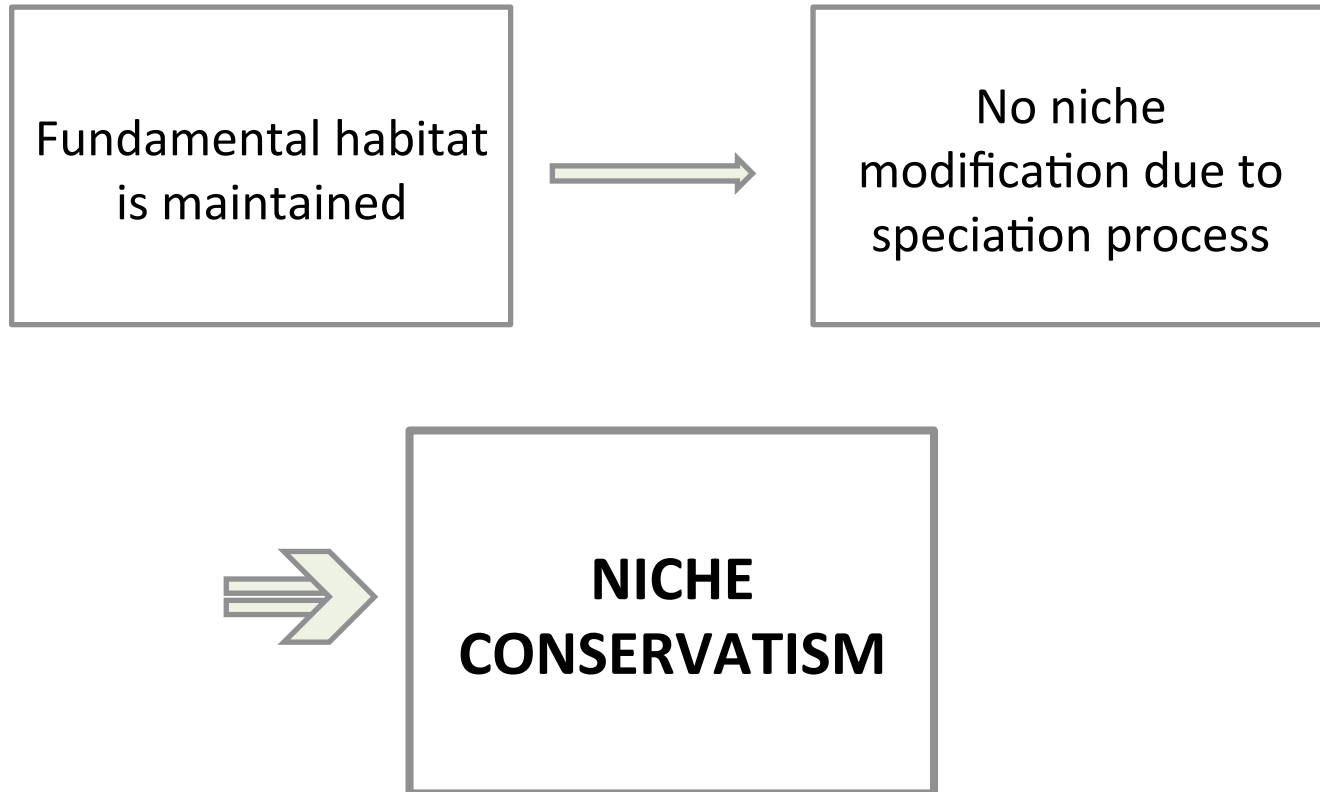


## General framework : Global PhD project



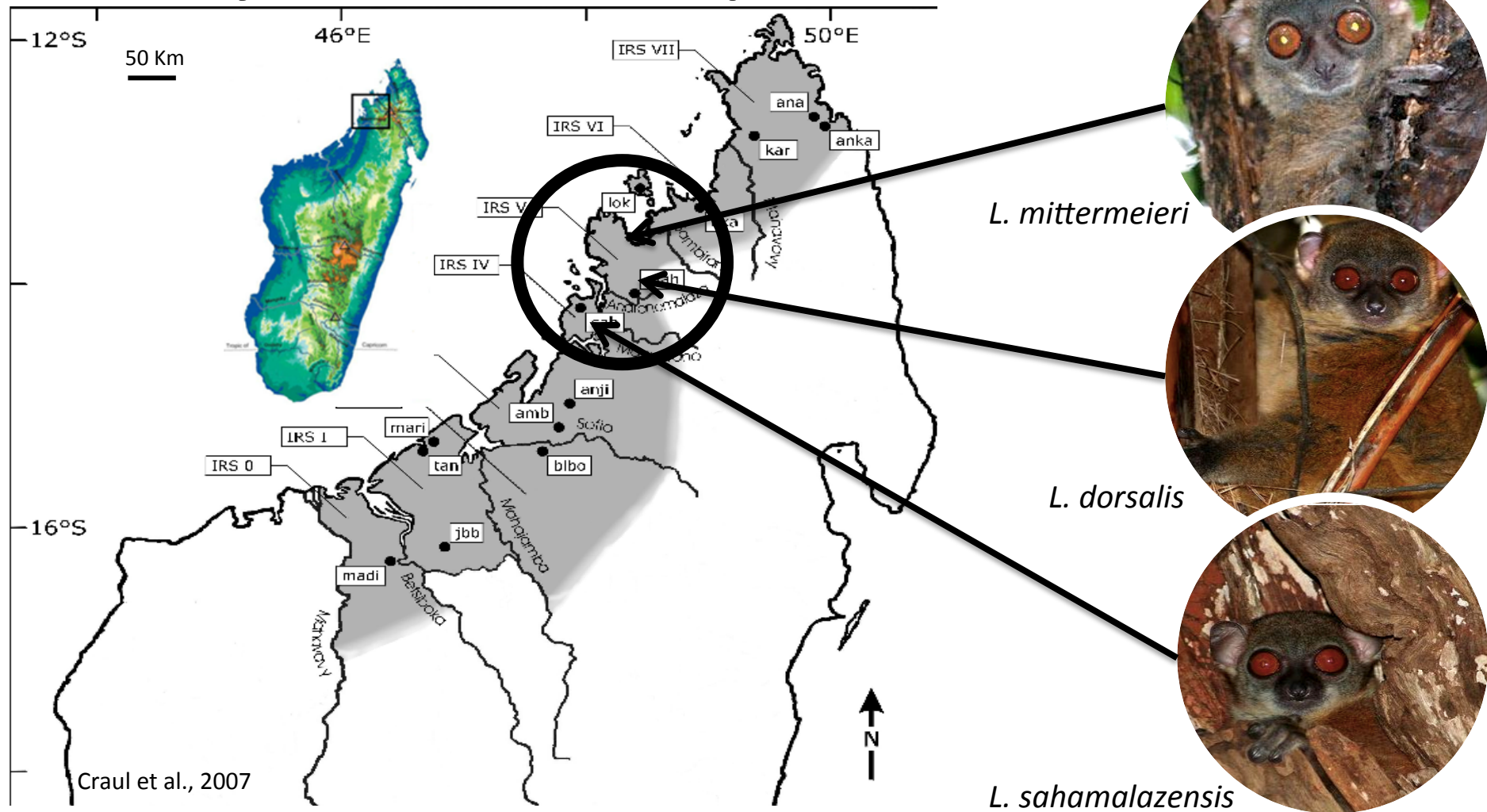
Vences *et al.*, 2009

# Hypothesis



Wilmet L., Schwitzer C., Devillers P., Beudels-Jamar R.C, and Vermeulen C. 2014. **Speciation in Malagasy lemurs: a review of the cryptic diversity in the genus *Lepilemur***. *Biotechnol. Agron. Soc. Environ.* 18(4), 577-588.

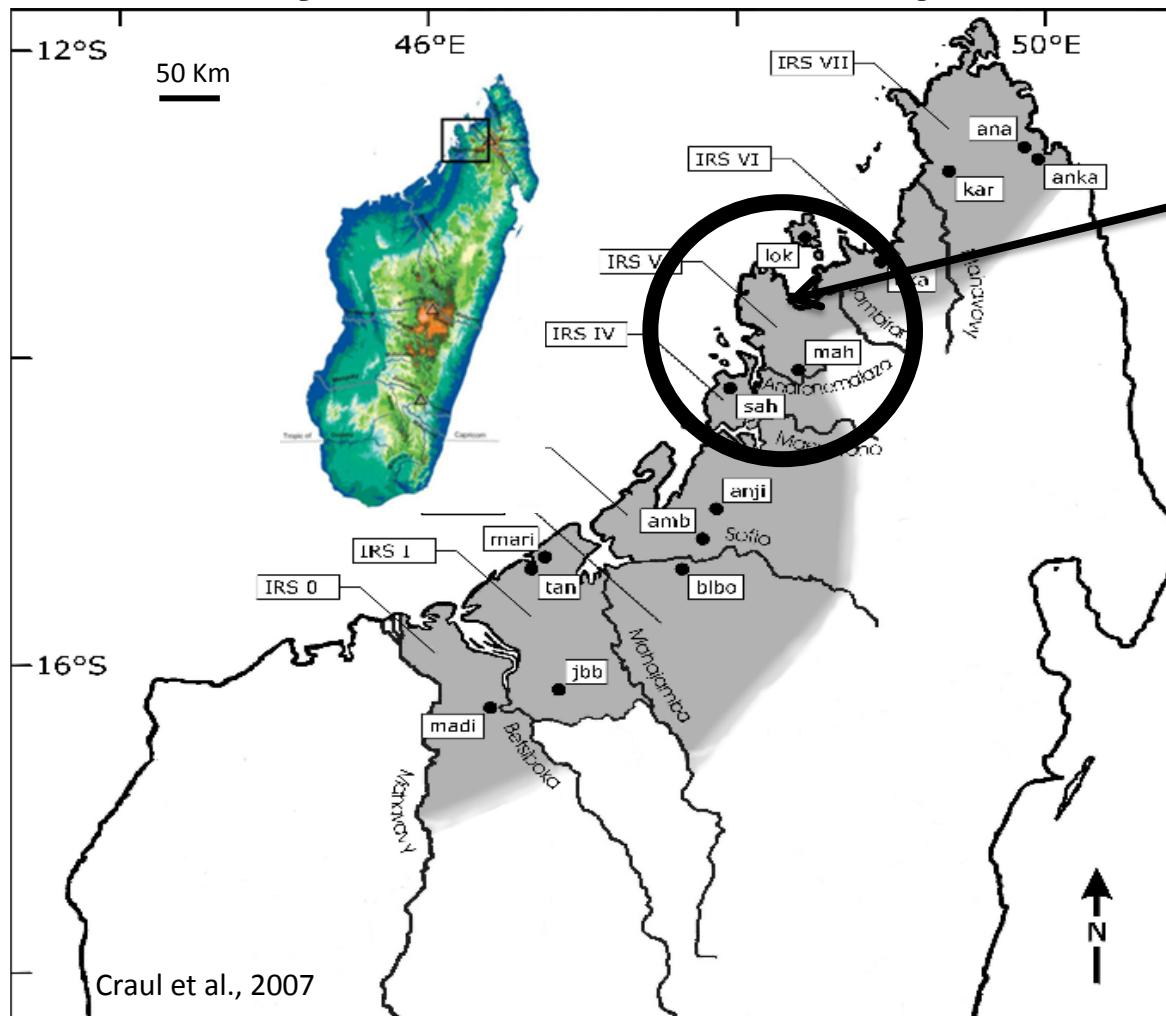
## Study sites and studied species



Wilmet L., R.C. Beudels-Jamar, C. Schwitzer, P. Devillers & C. Vermeulen. 2015. **Le Parc National Sahamalaza - Iles Radama serait-il l'ultime refuge pour certaines espèces de lémuriens du nord-ouest de Madagascar ?** Tropicultura. NS. 33-42



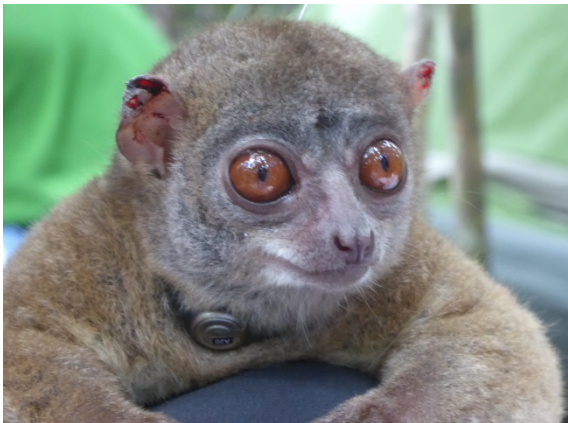
## Study sites and studied species



*L. mittermeieri*



# *Lepilemur mittermeieri*



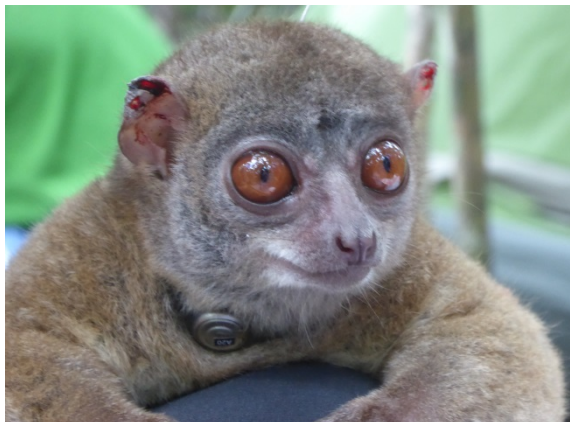
## *Lepilemur mittermeieri*

**Area of distribution:** Ampasindava Peninsula (125 250 ha of protected area)

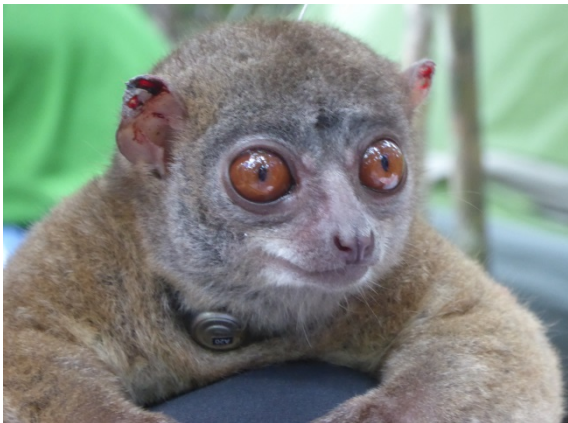
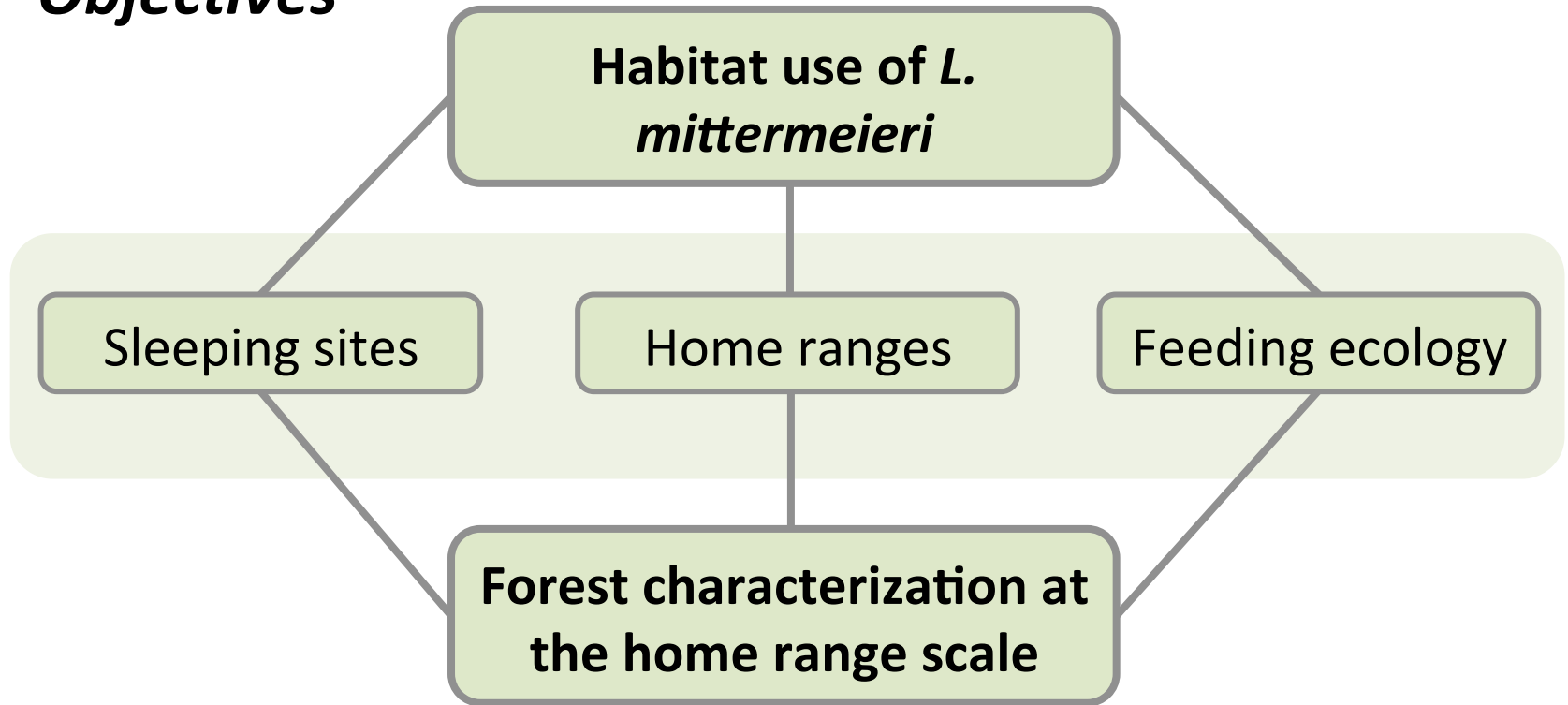
**What do we know :**

1. Described in 2006 - molecular analysis on 3 animals (Rabarivola et al., 2006)
2. Short publication on density evaluation (Ralantoharijaona et al., 2014)
3. New field data on *L. mittermeieri* ( Wilmet et al., submitted)

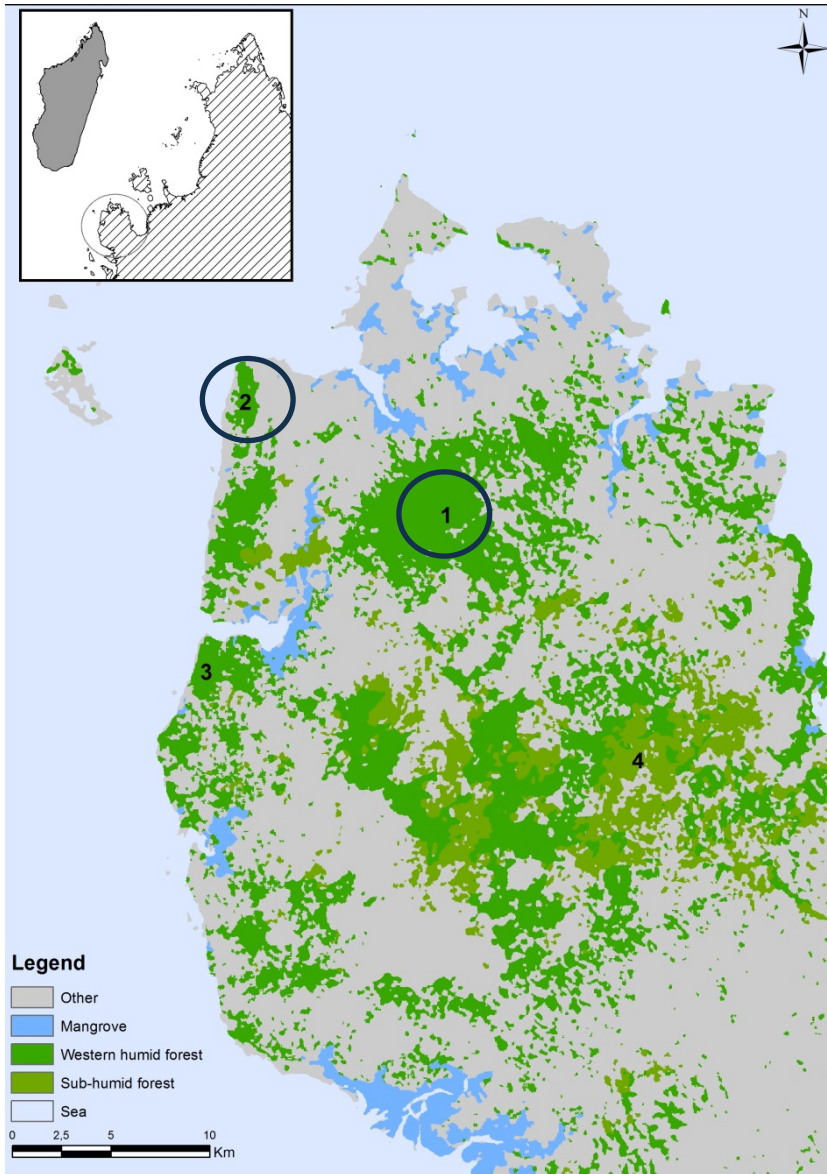
***A very little known species***  
***Critically endangered (IUCN)***



## *Objectives*



## Study sites



**Site N°1: Andranomatavy mountain**  
Height elevation (~450m)  
Humid forest (3100 ha)

**Site N°2: Sorony forest**  
Low elevation (~120 m)  
Sub-humid forest



**Comparison between  
two forest patches**

## Radio – collaring

1. Capture
2. Morphometric measurement
3. Equipment with radio-collar  
(*Cable-tie* Biotrack UK)



Collaboration with : 1) *Madagascar Biodiversity Partnership* and  
2) The veterinary HAJANIRINA RAKOTONDRAINIBE

## *Method*

### Habitat use of *L. mittermeieri*

Sleeping sites

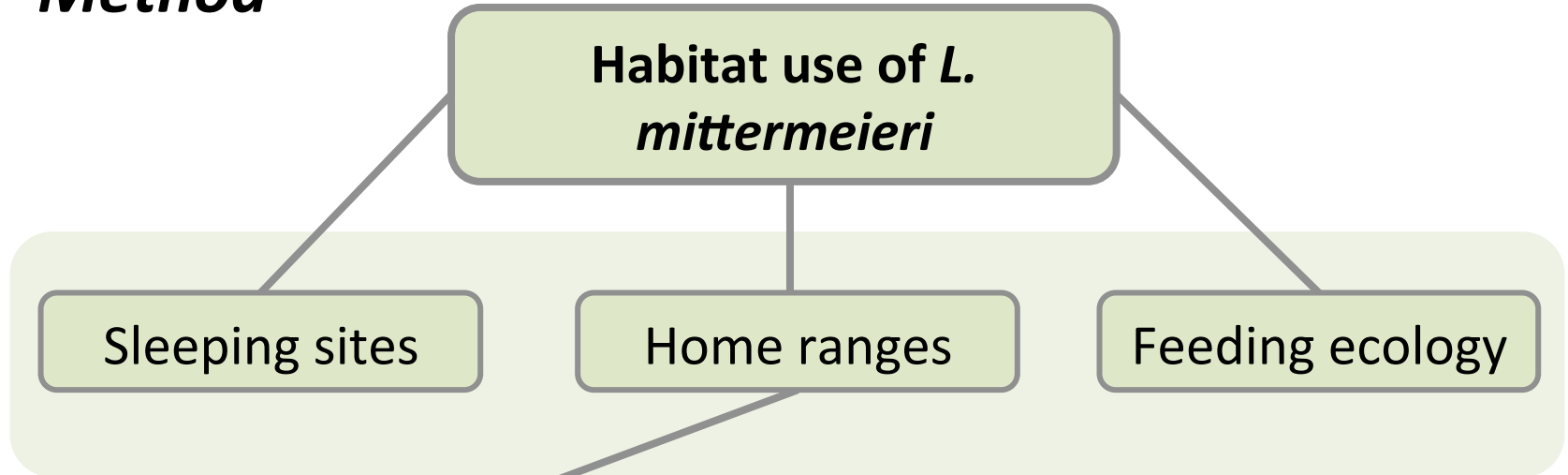
Home ranges

Feeding ecology

- Radio tracking during the day
- Sleeping sites characterization:
  - height, type, volume, tree species, microhabitat,...)
- Occupation of the sleeping sites



## Method

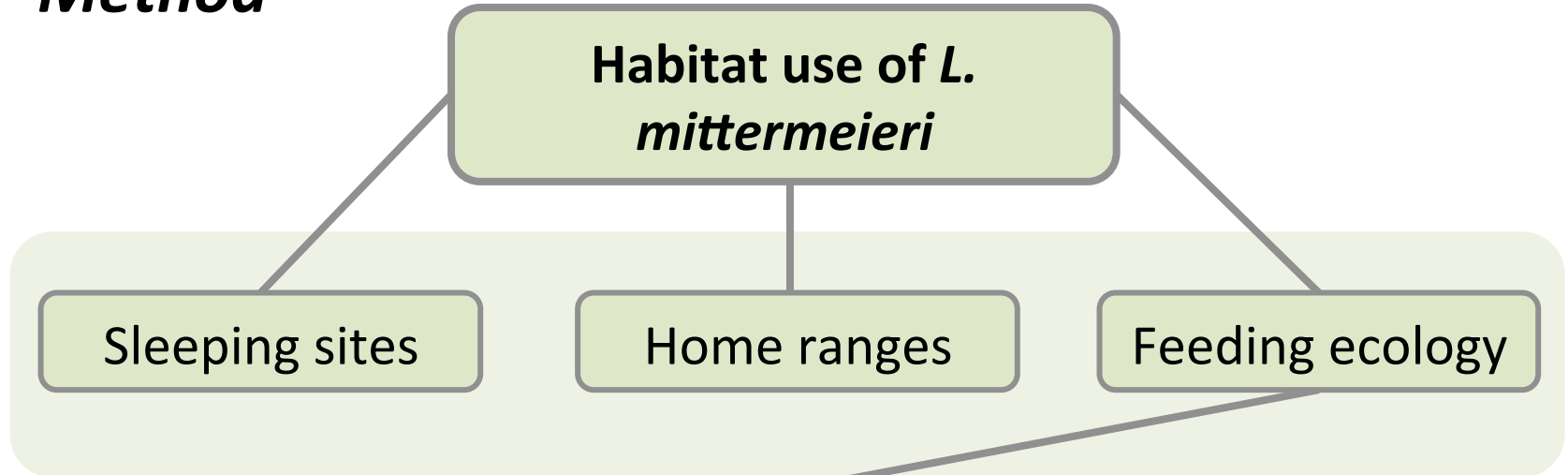


- Radio tracking during the night (6H/night) (from 6PM to 00 AM) (*Hypothesis* : no differences between half part of the night)
- Team of 3 observers
- GPS point recorded every 10 min.
- Home range : MCP





## *Method*



- **Direct observation during the night of tracking**
- **Team of 3 observers**
- **Collection of plant material**
- **Collection of feces samples**



## ***Method***

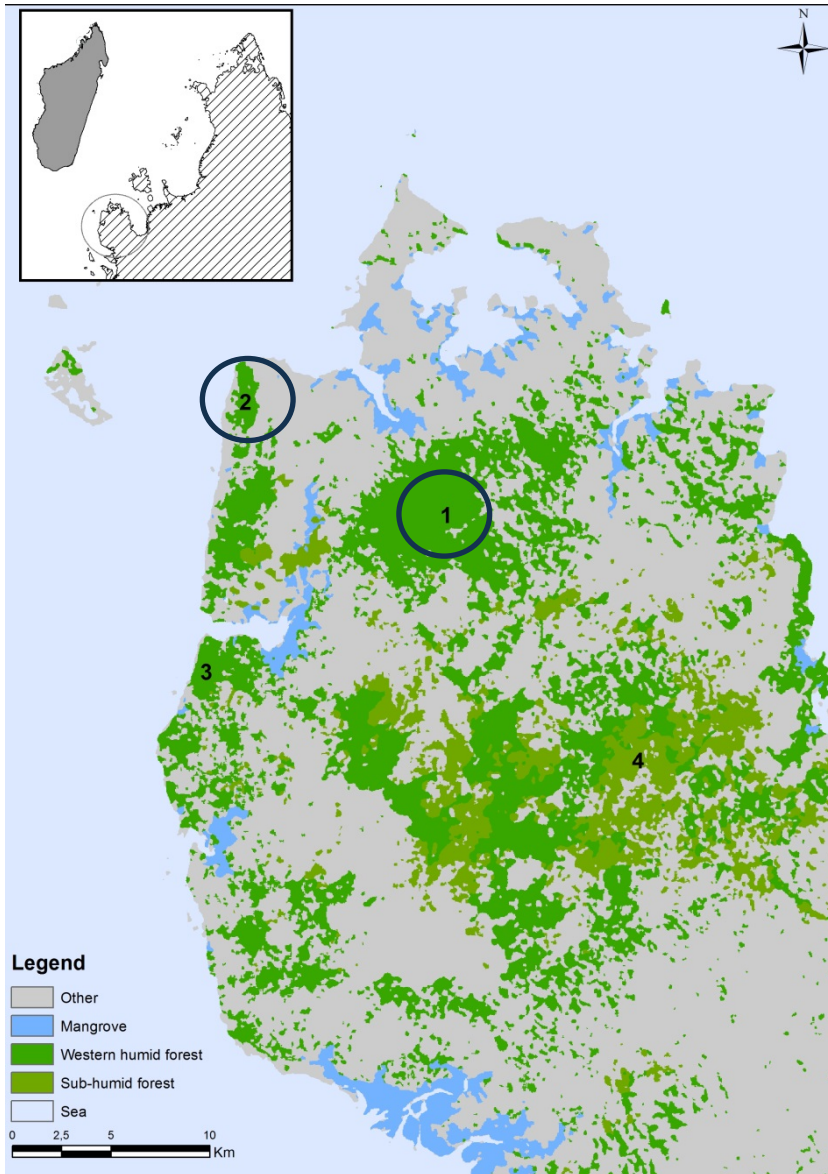
### **Habitat use of *L. mittermeieri***

#### **Forest characterization at the home range scale**

- 4 home ranges (2 in each site)
- Exhaustive characterization for every tree which circum. > 15 cm:
  - Circumference
  - Light received (Dawkins index)
  - Height
  - Tree species

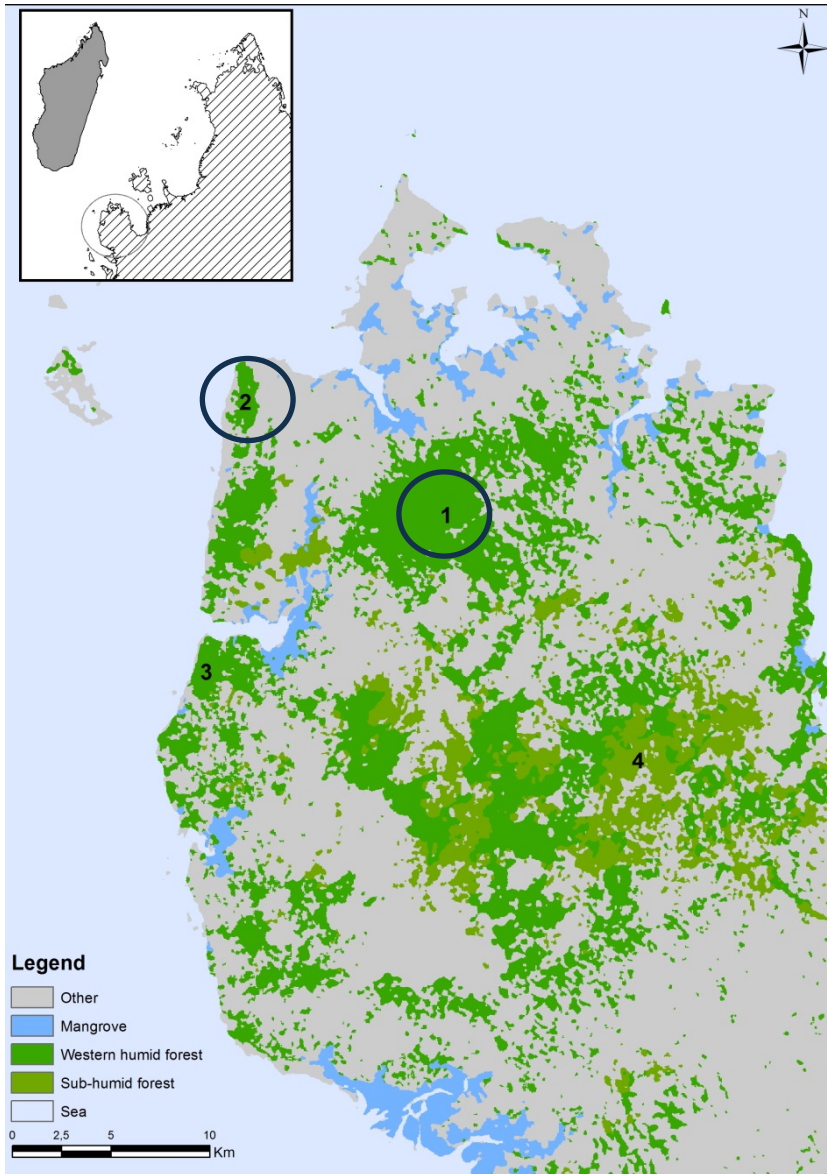


## Study sites



5 months field mission (February–July 2015)

## Study sites



5 months field mission (February–July 2015)

**Site N°1: Andranomatavy mountain**

- 4 males

**Site N°2: Sorony forest**

- 2 females
- 3 males

## *Sleeping sites*

Data collected from May to June 2015

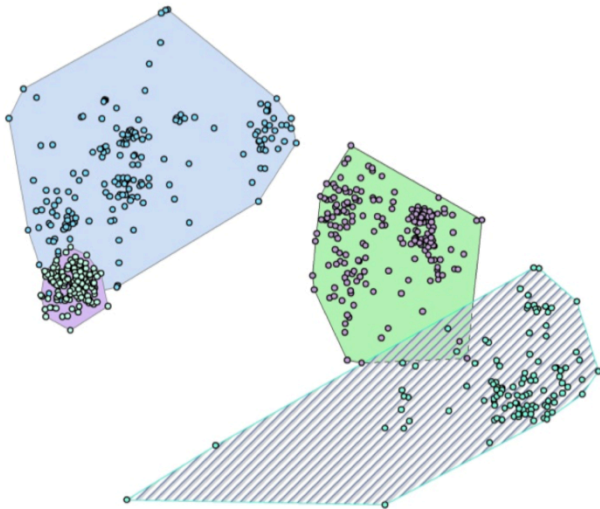
	Total number of different sites found	Total number in tangles of branches	Total number in tree holes	Total number in unknown locations	Average number of sleeping sites per animal	Number used by another individual in another night	Number of tree species used for sleeping sites
Site n°1 Andrano. mountain	19	9	6	4	4,75	4	13
Site n°2 Sorony forest	20	8	5	7	4	0	15
<b>TOTAL</b>	<b>39</b>	<b>17</b>	<b>11</b>	<b>11</b>			<b>27</b>

**First observations: (maximum 20 days in Site n°1 and 25 days in site n°2)**

- Majority in tangles of branches
- Average of 4 sleeping sites per animal
- Always sleeping alone
- Sleeping sites rarely used by more than one individual
- Not a clear preference for one tree species

# Home ranges

## Home ranges - Andranomatavy mountain



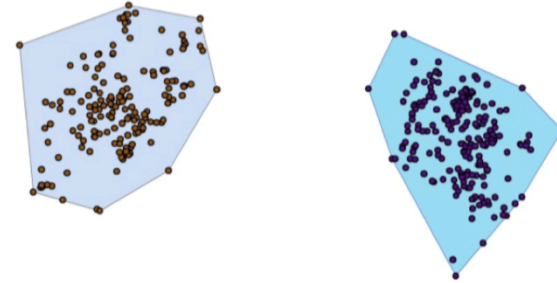
### Legend

- HR-Lep1 (male) (5.68 ha)
- HR-Lep2 (male) (2.97 ha)
- HR-Lep3 (male) (0.40 ha)
- HR-Lep4 (male) (5,36 ha)

0 50 100 Meters

Coordinate system: WGS 1984 - UTM 38S

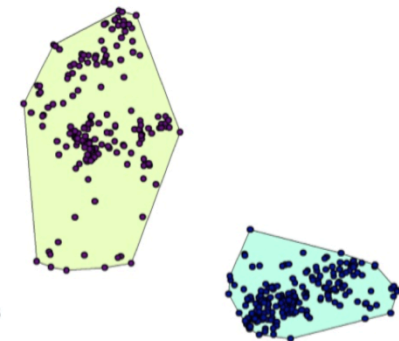
## Home ranges - Sorony Forest



- Gps point of radio tracking
- HR-Lep1 (male) (1.49 ha)
- HR-Lep4 (female) (1.49 ha)
- HR-Lep3 (female) (1.75 ha)
- HR-Lep2 (male) (1.74 ha)

0 50 100 Meters

Coordinate system : WGS 1984 - UTM 38S



## Home ranges

Site	Number of hours of radio tracking	Animal	Area (ha)	Average (ha)
1. Height elevation	112	Lep1 (M)	5,68	3,60
		Lep2 (M)	2,97	
		Lep3 (M)	0,40	
		Lep4 (M)	5,36	
2. Low elevation	125	LepS1 (M)	0,734	1,43
		LepS2 (M)	1,74	
		LepS3 (F)	1,75	
		LepS4 (F)	1,49	

Species	Area (ha) *
<i>L. edwardsi</i>	1
<i>L. ruficaudatus</i>	0,8
<i>L. mustelinus</i>	0,24 - 0,3
<i>L. sahamalazensis</i>	1,4

\* Seiler *et al.*, 2012; Zinner *et al.*, 2003; Milton *et al.*, 1976; Mitani *et al.*, 1979.

### First observations:

- Overlaps are observed between home ranges
- Differences in average size of home ranges are observed between the two sites (Significance ? Correlation with forest composition? Sexual differences?).
- Home ranges observed in the high-elevation site are large when compared to those known for species of *Lepilemur* studied so far.

## Feeding ecology

**Plant species - feeding observation - Andranomatavy**

	Part of the plant	Family	Species
1	Leaf	ANACARDIACEAE	<i>Sorindeia madagascariensis</i>
2	Leaf	APOCYNACEAE	<i>Mascarenhasia arborescens</i>
3	Leaf	APOCYNACEAE	<i>Secamone sp.</i>
4	Fruit	ARECACEAE	<i>Dypsis sp.</i>
5	Leaf	CELASTRACEAE	<i>Mystroxyllum aethiopicum</i>
6	Leaf	DICHAPETALACEAE	<i>Dichapetalum madagascariense</i>
7	Leaf	DICHAPETALACEAE	<i>Dichapetalum pachypus</i>
8	Leaf	EUPHORBIACEAE	<i>Drypetes sp.</i>
9	Leaf	EUPHORBIACEAE	<i>Securinea seyrigii</i>
10	Leaf	FABACEAE	<i>Abrus precatorius</i>
11	Leaf	FABACEAE	<i>Entada pervillei</i>
12	Leaf	ICACINACEAE	<i>Demostachys sp.</i>
13	Leaf	MALVACEAE	<i>Grewia cuneifolia</i>
14	Leaf	MALVACEAE	<i>Grewia sp.</i>
15	Leaf	MELIACEAE	<i>Malleastrum boivinianum</i>
16	Leaf	MORACEAE	<i>Trophis montana</i>
17	Leaf	OCHNACEAE	<i>Ochna greveanum</i>
18	Leaf	OLEACEAE	<i>Noronhia candicans</i>
19	Fruit	RUBIACEAE	<i>Coptosperma sp.</i>
20	Leaf	RUBIACEAE	<i>Peponidium sp.</i>
21	Leaf	VIOLACEAE	<i>Rinorea angustifolia</i>

**Plant species - feeding observation - Sorony**

	Part of the plant	Family	Species
1	Leaf	SALICACEAE	<i>Homalium cf. nudiflorum</i>
2	Leaf	EUPHORBIACEAE	<i>Drypetes thouarsii</i>
3	Leaf	APOCYNACEAE	<i>Carissa septentrionalis</i>
4	Leaf	EBENACEAE	<i>Diospyros impressinervi</i>
5	Leaf	MYRISTICACEAE	<i>Brochoneura acuminata</i>
6	Leaf	APOCYNACEAE	<i>Carissa septentrionalis</i>
7	Leaf	EUPHORBIACEAE	<i>Wielandia platyrachis</i>
8	Leaf	APOCYNACEAE	<i>Uvaria decaryana</i>
9	Leaf	RUBIACEAE	<i>Polysphaeria acuminata</i>
10	Leaf	CAPPARIDACEAE	<i>Tylachium sumangii</i>
11	Leaf	EUPHORBIACEAE	<i>Wielandia bojeriana</i>
12	Leaf	ERYTHROXYLACEAE	<i>Erythroxylum retusum</i>
13	Leaf	CELASTRACEAE	<i>Salacia madagascariensis</i>
14	Leaf	BUXACEAE	<i>Buxis macrocarpa</i>
15	Leaf	EUPHORBIACEAE	<i>Wielandia bojeriana</i>
16	Leaf	EUPHORBIACEAE	<i>Wielandia platyrachis</i>
17	Leaf	ERYTHROXYLACEAE	<i>Erythroxylum retusum</i>
18	Leaf	FABACEAE	<i>Viguieranthus ambongensis</i>
19	Leaf	DILLENIACEAE	<i>Tetracera madagascariensis</i>
20	Leaf	MELIACEAE	<i>Kaya madagascariensis</i>
21	Leaf	OCHNACEAE	<i>Ochna pervilleana</i>
22	Leaf	CLUSIACEAE	<i>Garcinia decipiens</i>
23	Leaf	ANACARDIACEAE	<i>Abrahamia sambiranensis</i>
24	Leaf	MORACEAE	<i>Treculia madagascariensis</i>

### First observations:

- 44 species identified as feeding species
- 1 species in common between the 2 sites (although many more species are shared between the two sites)



## ***Forest characterization***



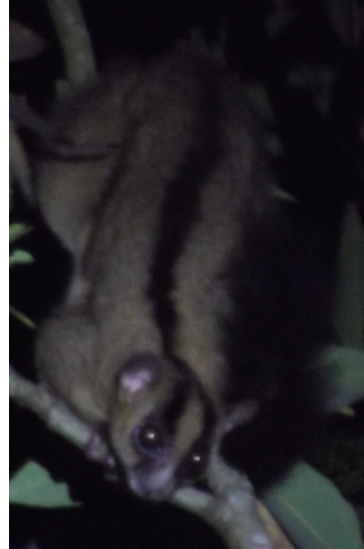
**The feeding preferences, the home ranges and the sleeping sites data are being analysed in the context of forest composition and structure data...**

**=> understand habitat use of *L. mittermeieri***

## ***Additional observations***



*H. occidentalis*



*Phaner parienti*



*Avahi unicolor*



*Mirza zaza*



*Eulemur macaco*



## *Additional observations*



*Microcebus sp. (Microcebus sambiranensis ?)*

# Acknowledgments



Fonds Léopold III  
pour l'Exploration et la Conservation de la Nature asbl



# THANK YOU FOR YOUR ATTENTION

