



Distribution assessment of endangered *Lepilemur* in northwestern Madagascar

Leslie Wilmet

Promoteurs: Cédric Vermeulen – Roseline Beudels-Jamar

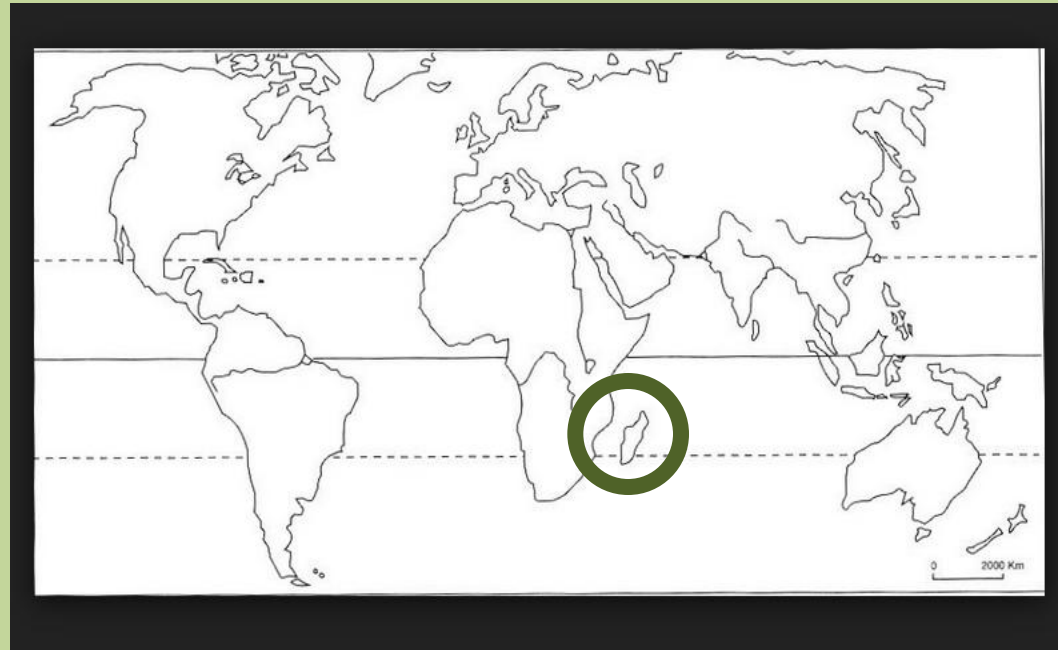
21 Octobre 2013

Journée Faune – Gembloux Agro-Bio Tech

Table of contents

- 1.Madagascar
- 2.The genus lepilemur
- 3.Context of the research
- 4.Goals of the research
- 5.Results of the research
- 6.Discussion
- 7.Conclusion

I.1 Madagascar



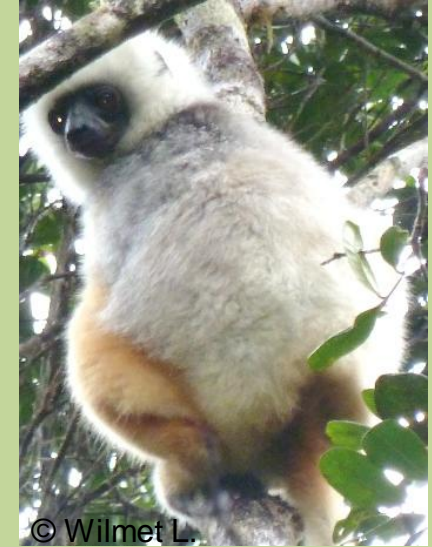
- ✓ Climatic characteristics
- ✓ Topography
- ✓ Geological history
- ✓ Isolation

➔ Biodiversity hotspot

➔ Deforestation

I.1 Madagascar

1.1.1 Primate of Madagascar



103 species of lemurs – 5 families



I.2 The genus *Lepilemur*

1.2.1 Phylogeny

Kingdom	<i>Animalia</i>
Phylum	<i>Chordata</i>
Under phylum	<i>Vertebrata</i>
Class	<i>Mammalia</i>
Infra Classe	<i>Eutheria</i>
Order	<i>Primates</i>
Suborder	<i>Strepsirrhini</i>
Infraorder	Lemuriformes
Family	<i>Lepilemuridae</i>
Genus	<i>Lepilemur</i>

sportive lemurs

Before 2006
⇒ 8 species

Today
⇒ 26 species

1.2 The genus *Lepilemur*

1.2.2 General informations

- Medium-sized primates (body length ~ 20cm / tail length ~ 25 cm/ weight < 1 kg)
- Nocturnal and folivorous
- Exclusively arboreal



L. tymerlachsonorum

1.2 The genus *Lepilemur*

1.2.2 General informations



- Tree holes and tangles of branches used as shelter during the day

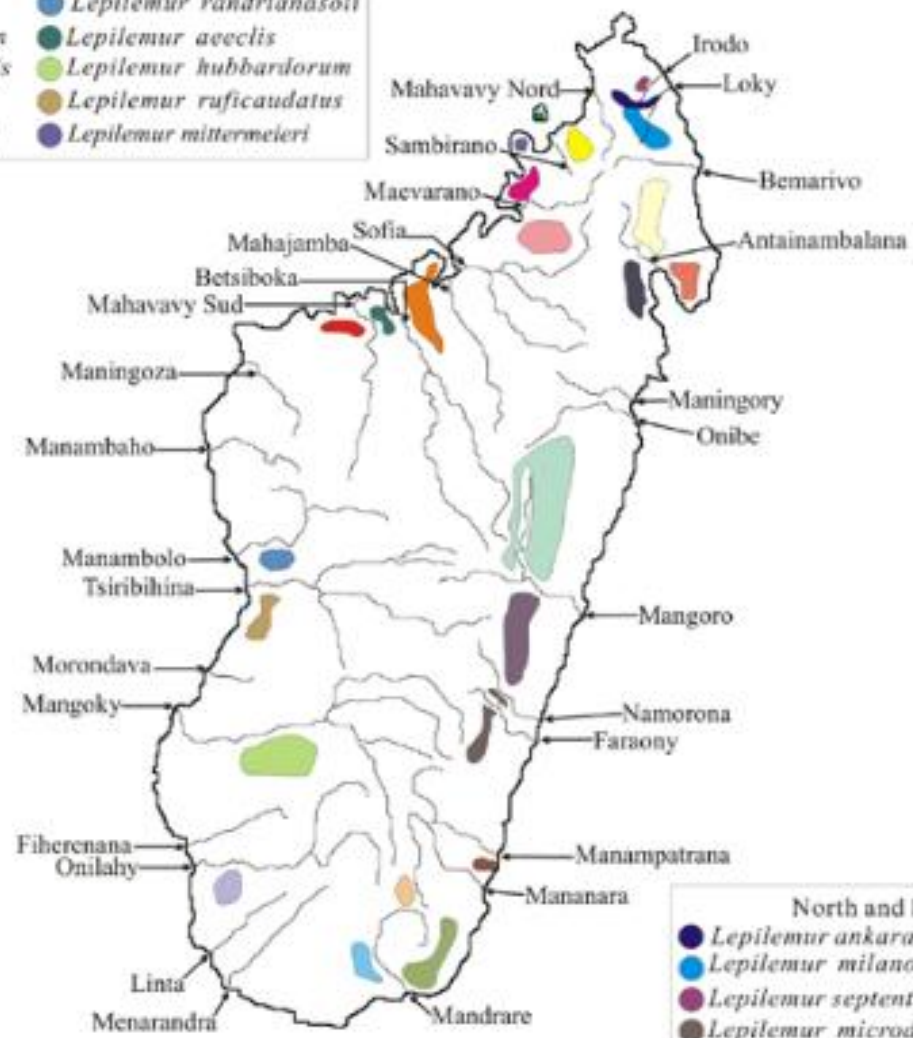
I.2 The genus *Lepilemur*

1.2.3 Distribution and habitat

- Usually found in low-and mid-altitude evergreen and deciduous forests



- West Coast *Lepilemur* Species**
- *Lepilemur tymerlachsoni*
 - *Lepilemur dorsalis*
 - *Lepilemur ahmansonorum*
 - *Lepilemur sahamalazensis*
 - *Lepilemur edwardsi*
 - *Lepilemur grevcockorum*
 - *Lepilemur petteri*
 - *Lepilemur randrianasoli*
 - *Lepilemur aecclis*
 - *Lepilemur hubbardorum*
 - *Lepilemur ruficaudatus*
 - *Lepilemur mittermeieri*



- North and East Coast *Lepilemur* Species**
- *Lepilemur ankaranensis*
 - *Lepilemur milanoii*
 - *Lepilemur septentrionalis*
 - *Lepilemur microdon*
 - *Lepilemur leucopus*
 - *Lepilemur seali*
 - *Lepilemur species nova #2*
 - *Lepilemur jamesorum*
 - *Lepilemur betsileo*
 - *Lepilemur mustelinus*
 - *Lepilemur fleuretae*
 - *Lepilemur scottorum*
 - *Lepilemur wrightae*

Revised distribution map of the sportive lemurs (genus *Lepilemur*) of Madagascar.

Source: Lei et al. 2008

I.2 The genus *Lepilemur*

1.2.3 Distribution and habitat

- Usually found in low-and mid-altitude evergreen and deciduous forests
- Very small distribution
- Lack of information on the exact range boundaries of some of the species

I.2 The genus *Lepilemur*

1.2.3 Main threats

- **Natural predators**
 - Madagascar harrier hawk (*Polyboroides radiatus*)
 - Fossa (*Cryptoprocta ferox*)
 - Snakes (*Acrantophis madagascariensis*, *Acrantophis dumerili* and *Sanzinia madagascariensis*)



Cryptoprocta ferox

I.2 The genus *Lepilemur*

1.2.3 Main threats

- **Natural predators**
 - Madagascar harrier hawk (*Polyboroides radiatus*)
 - fossa (*Cryptoprocta ferox*)
 - snakes (*Acrantophis madagascariensis*, *Acrantophis dumerili* and *Sanzinia madagascariensis*)
 - **Human-caused disturbance**
 - Hunting
 - Deforestation and habitat fragmentation
- => Uplisting of many of the 26 *Lepilemur* species into one of the **threatened categories** of the IUCN Red List

I.3 The context of the research

Evolutionary processes

Explain

High species richness

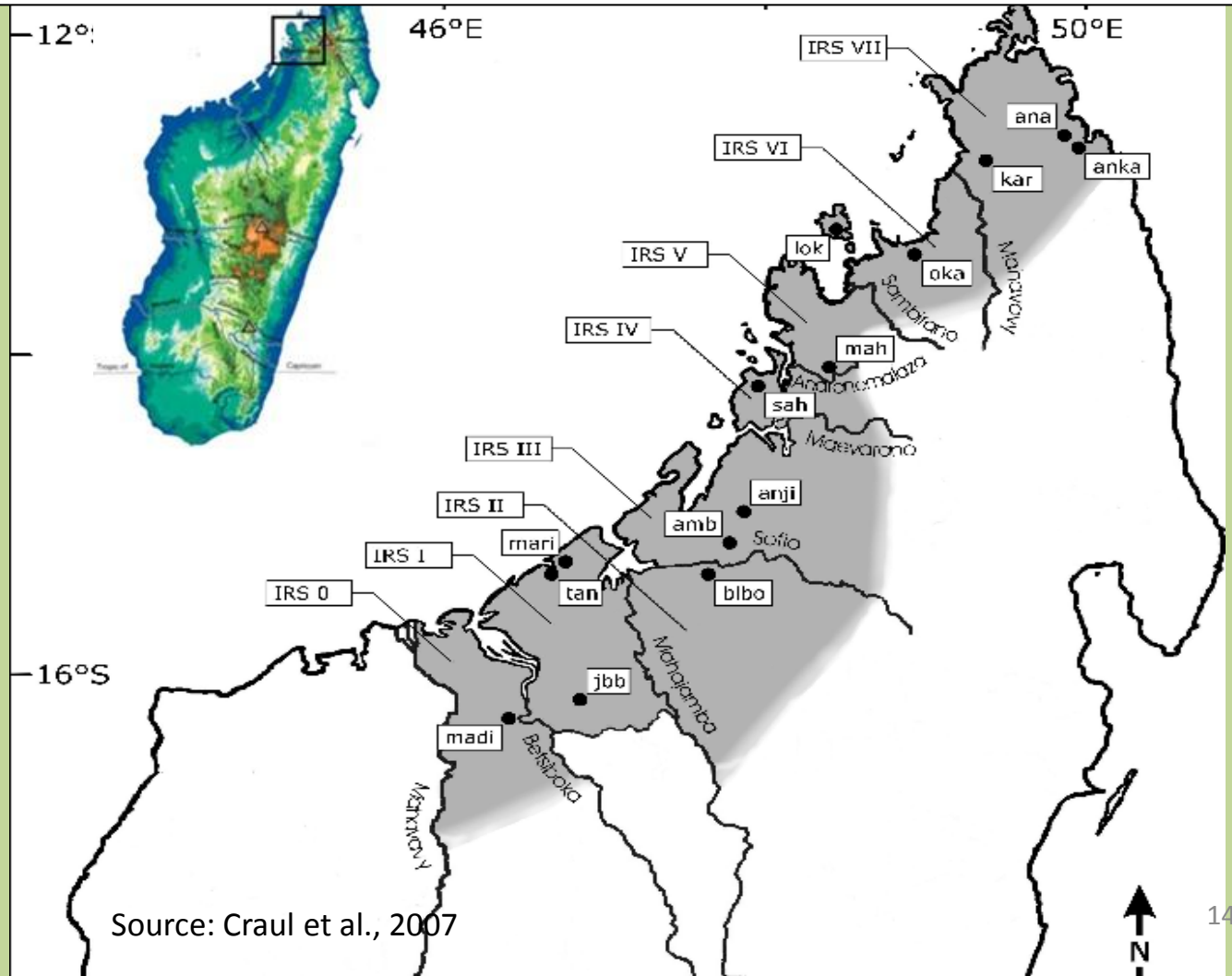
One of the diversification mechanisms
for Madagascar = Riverine barrier

Large River Model

I.3 The context of the research

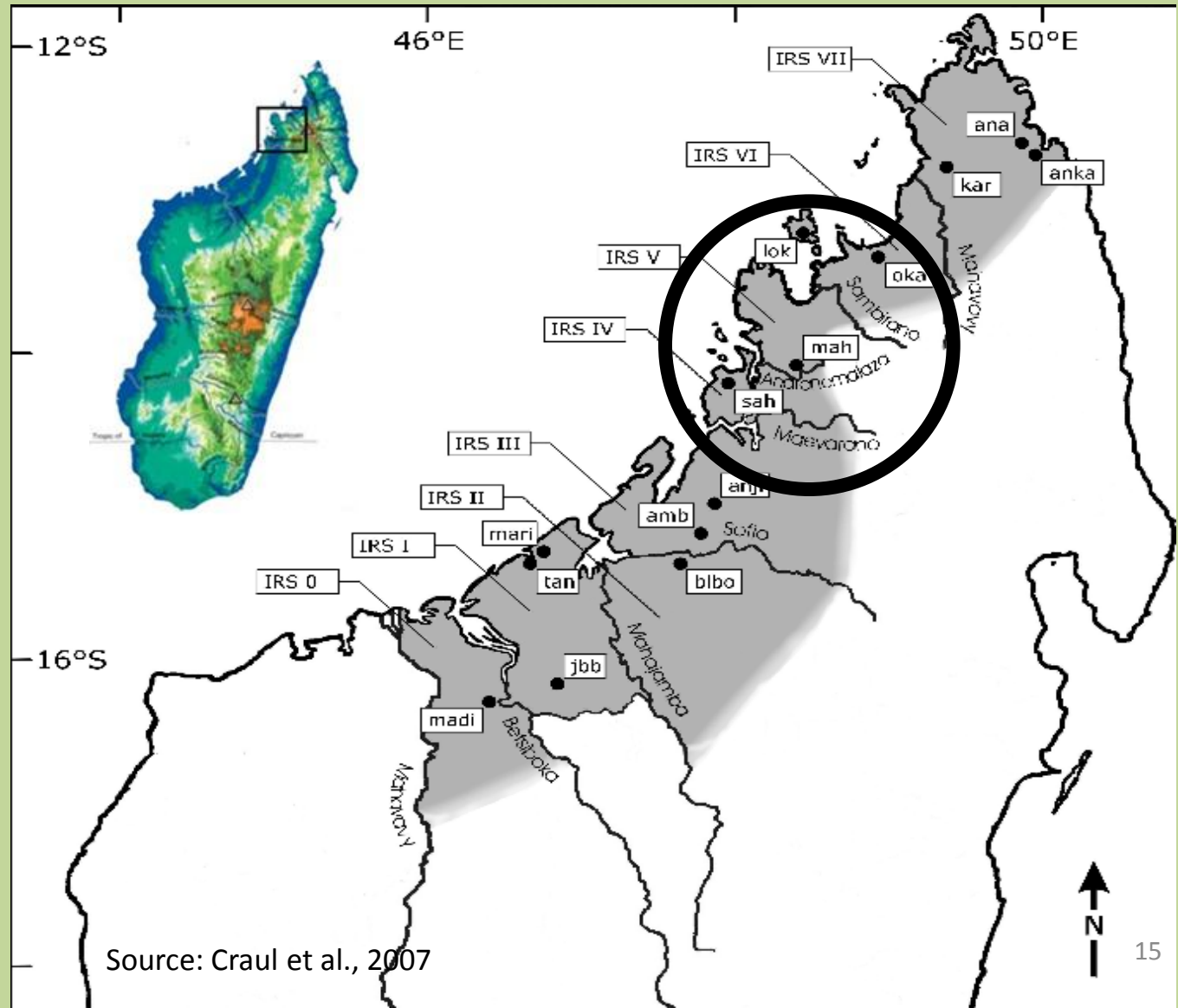
1.3.1. The Craul model “Large River Model” (2007)

7 Inter-River-System in northwestern Madagascar



I.3 The research

1.3.2. Area of the study



Source: Craul et al., 2007

I.3 The research

1.3.3. Studied species



L. sahamalazensis

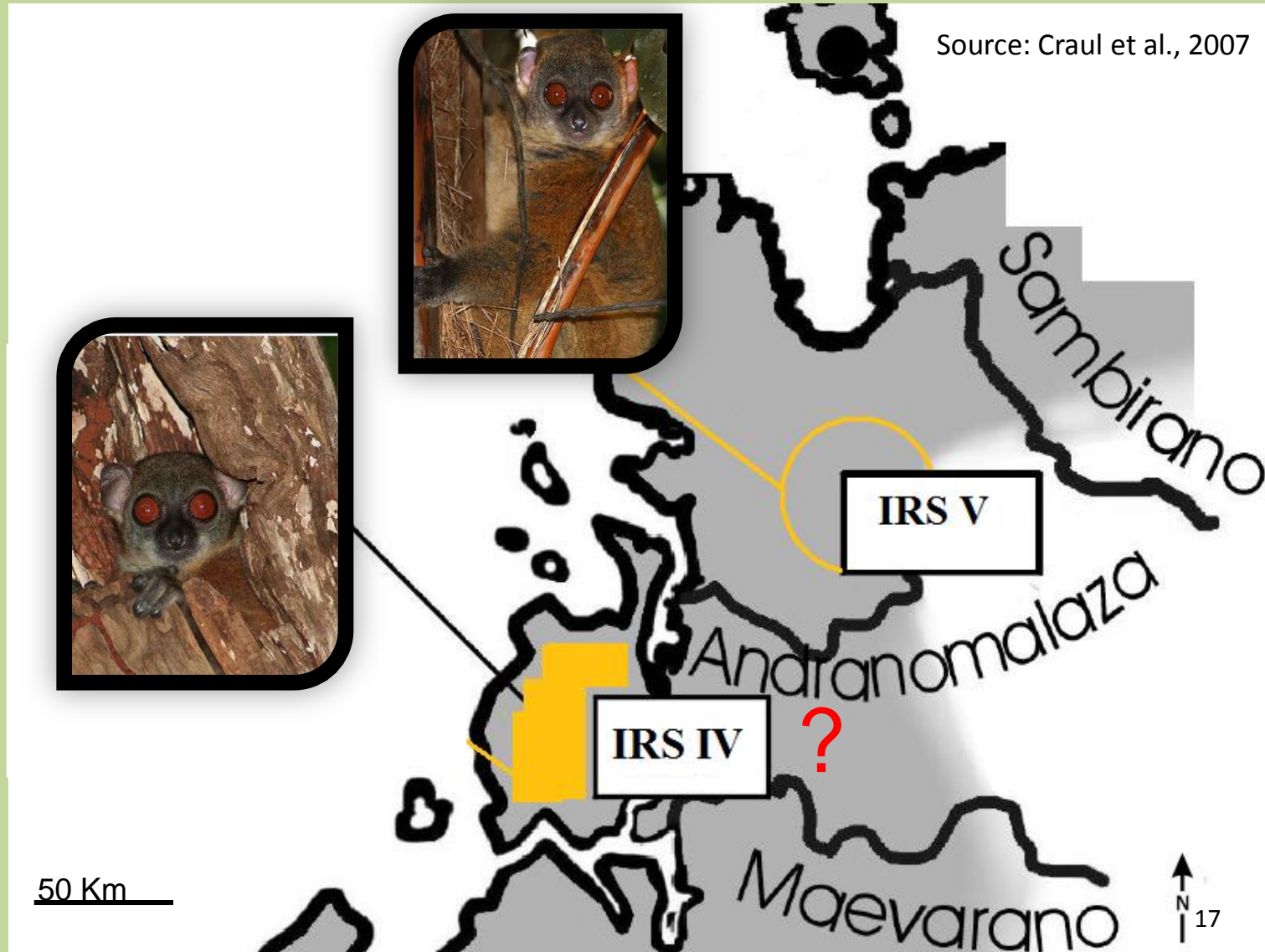


L. dorsalis



I.3 The research

1.3.2. Area of the study and hypothese



I.3 The research

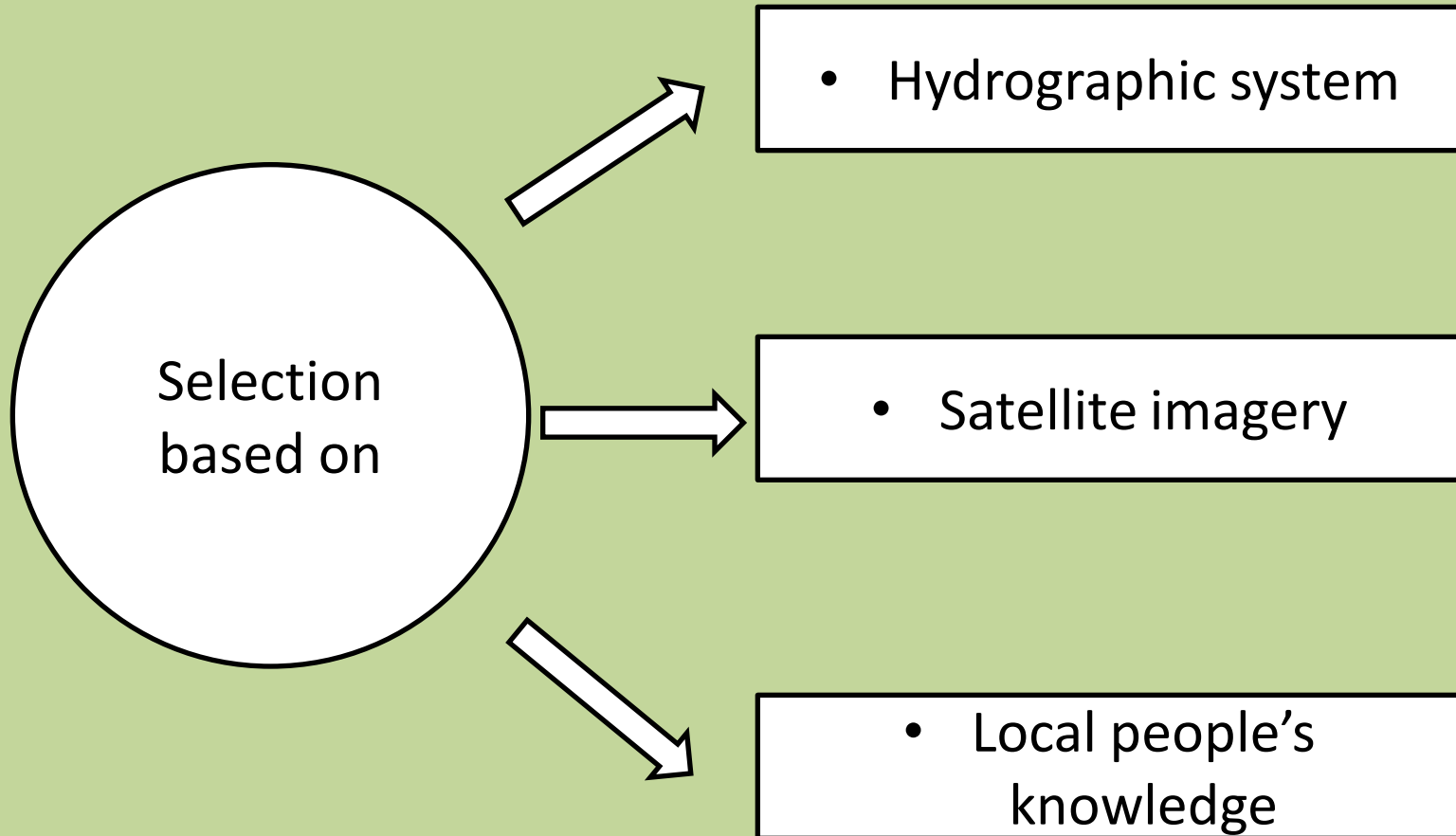
1.3.4. Objectives of the research

1. To determine in the field the exact distributions of *L. sahamalazensis*, currently unknown

2. To determine the extent of the distribution of *L. dorsalis*, south of the Manongarivo reserve

II.1 Study sites

II.1.1. Selection and localization of study sites



II.2 Forest characterization

Systematic for characterization



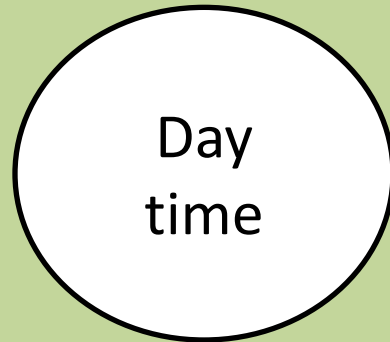
General qualification of
forest quality

Categories

0 = very bad
1 = bad
2 = medium
3 = good

II.3 Lemur survey

II.3.1. Presence/absence



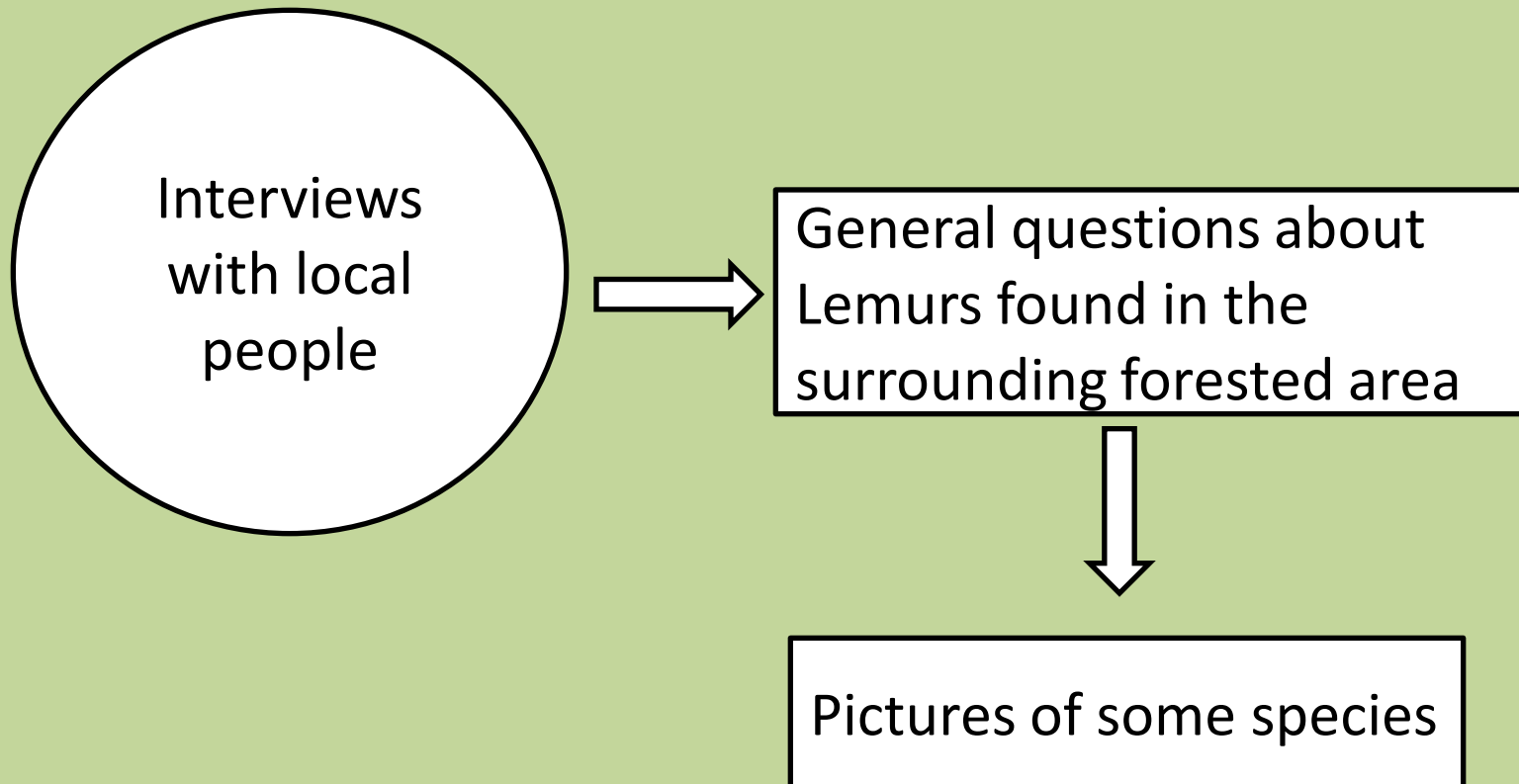
Reconnaissance walks run
by three persons (Main
researcher + two guides)



Nocturnal walks (minimum
of 2 hours)

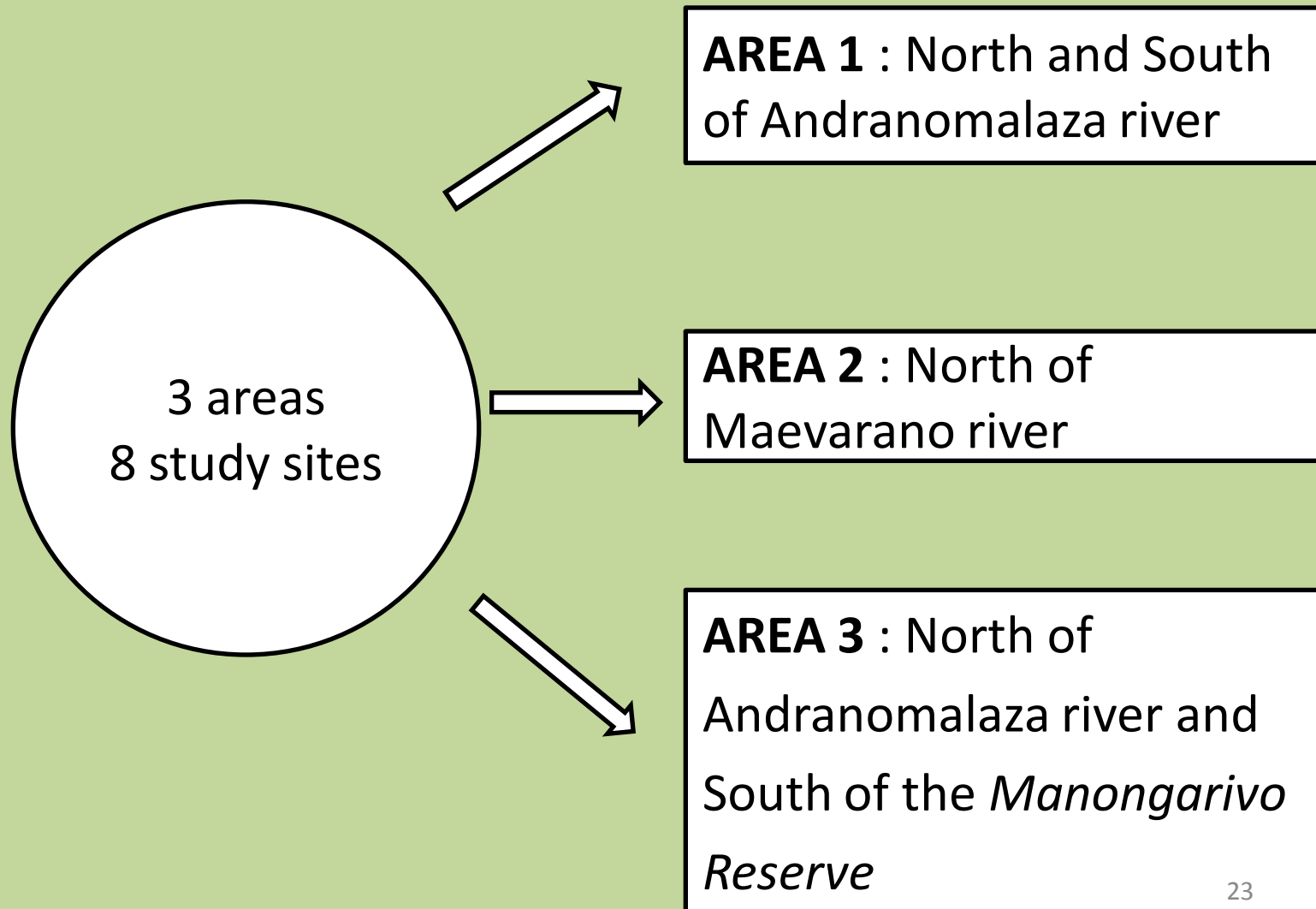
II.3 Lemur survey

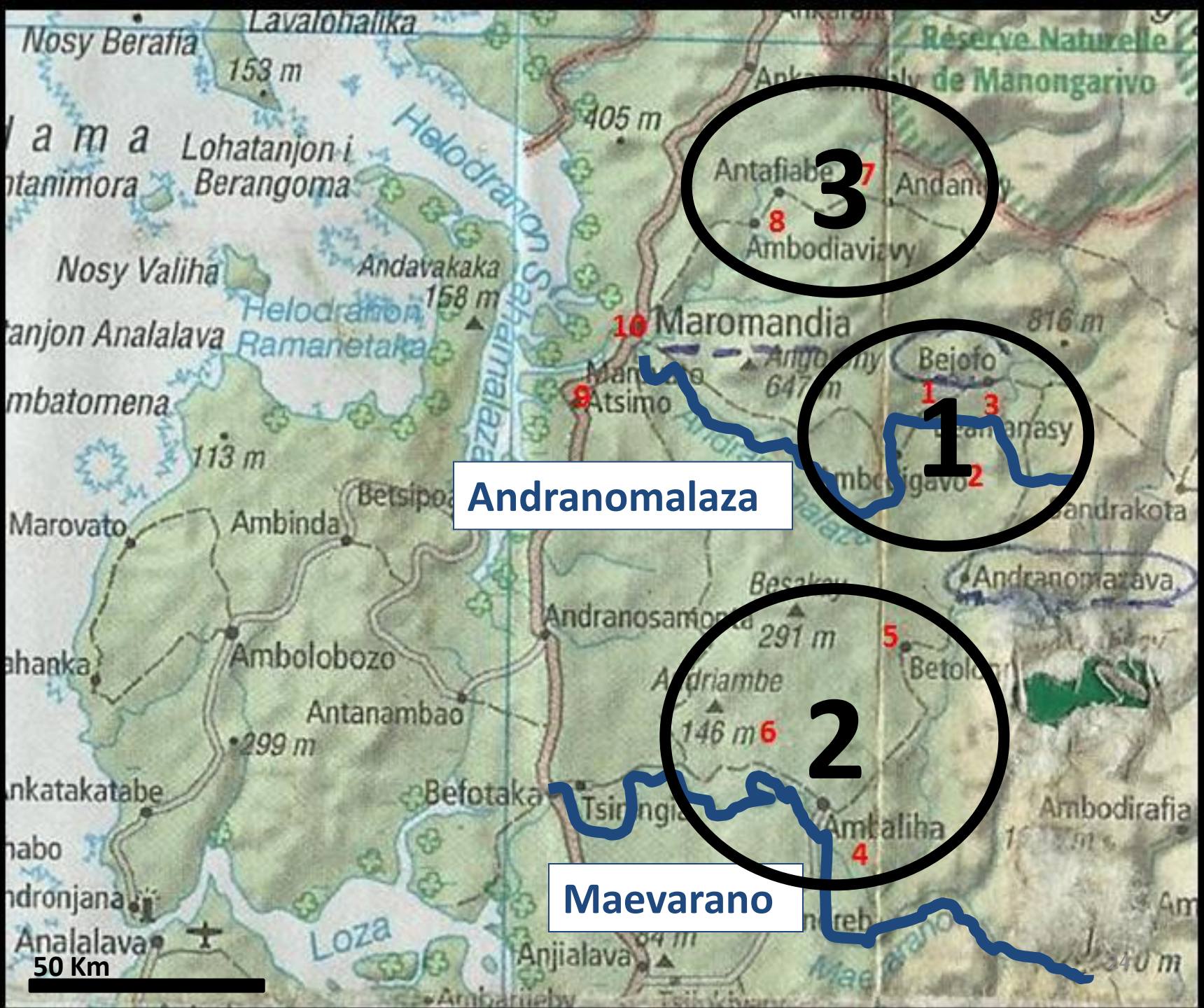
II.3.1. Presence/absence



II.1 Study sites

II.1.1. Selection and localization of study sites





III.1 Study sites characteristics

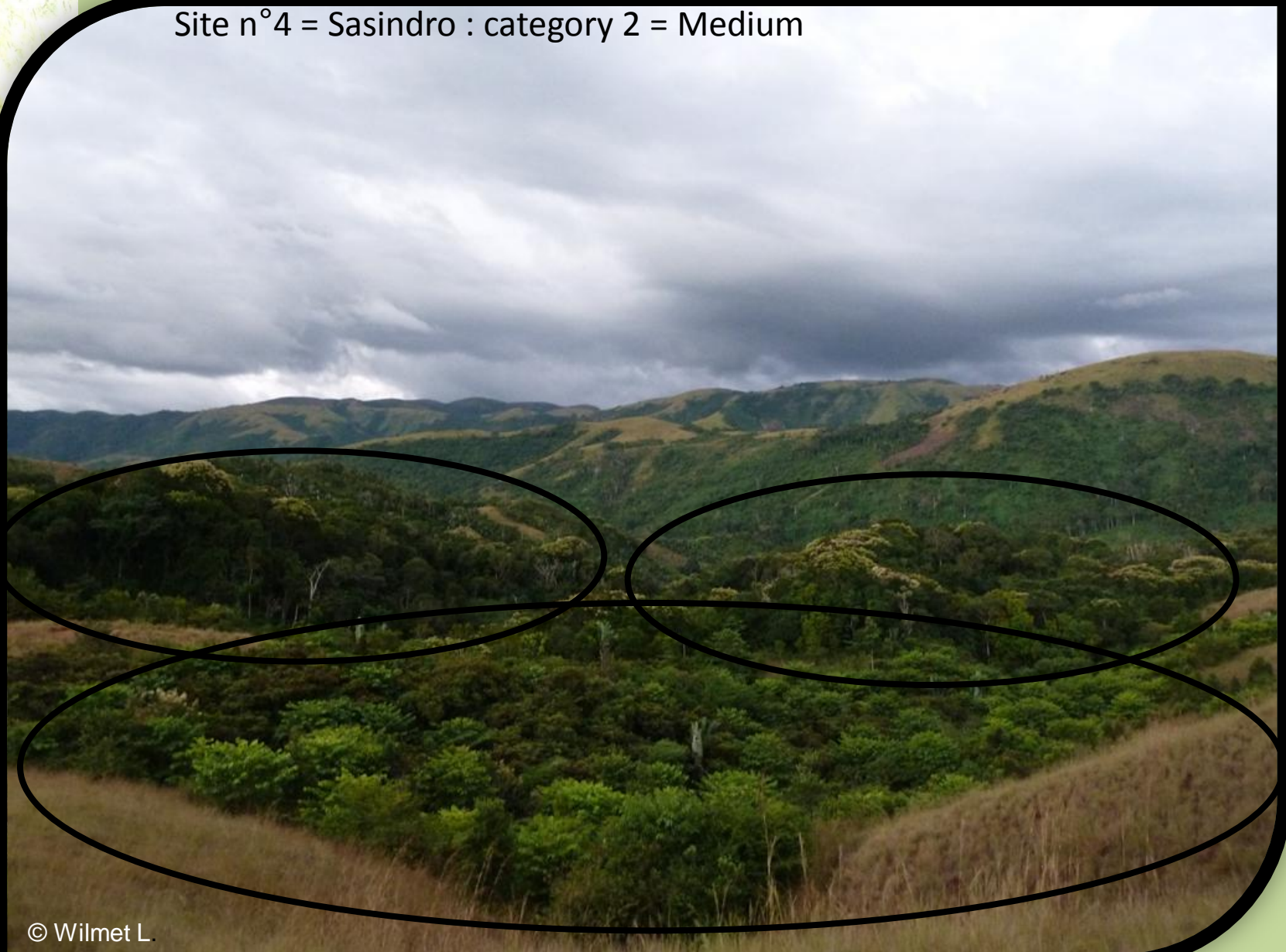
	SITE NO.	SITE	COORDINATES	ALTITUDE [M]	MONTH	FOREST CHARACTERIZATION (0=VERY BAD 1=BAD 2=MEDIUM 3= GOOD) (F=FAR AWAY)	HUNTING
AREA 1 (13 DAYS)	1	Bedjofo	S. 14°14'04.5" E. 48°18'59.5"	242	April	0	Yes
	2	Anefitrabe	S. 14°17'27.0" E. 48°21'42.4"	206	April	1	No
	3	Antsahabe	S. 14°12'00.2" E. 48°21'45.2"	219	April	2	Yes
AREA 2 (14 DAYS)	4	Sasindro	S. 14°32'39.4" E. 48°17'33.6"	154	April-May	1/2	No
	5	Betolongo	S. 14°24'40.4" E. 48°14'40.4"	44	May	1	Yes
	6	Andrafiabe	S. 14°29'54.6" E. 48°12'18.7"	31	May	2 F	Yes
AREA 3 (10 DAYS)	7	Bitsitsiky	S. 14°07'27.9" E. 48°13'49.8"	94	May	2 F	Yes
	8	Ambodivanio	S. 14°05'51.9" E. 48°10'57.7"	72	May	1	Yes

III.2 Forest characterization

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	5	Betolongo	S. 14°24'40.4" E. 48°14'40.4"	44	May	1	Yes
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III.2 Forest characterization

Site n°4 = Sasindro : category 2 = Medium



III.1 Lemur survey

III.1.1.Presence/absence of lemur species in the 8 study sites

(+) Presence according to local people
 + Presence according to researcher
 - Absence

Scientific name

<i>Eulemur macaco</i>	<i>Eulemur flavifrons</i>	<i>Mirza zaza</i>	<i>Hapalemur occidentalis</i>	?	<i>Lepilemur</i>	<i>Phaner parienti</i>
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Malagasy name

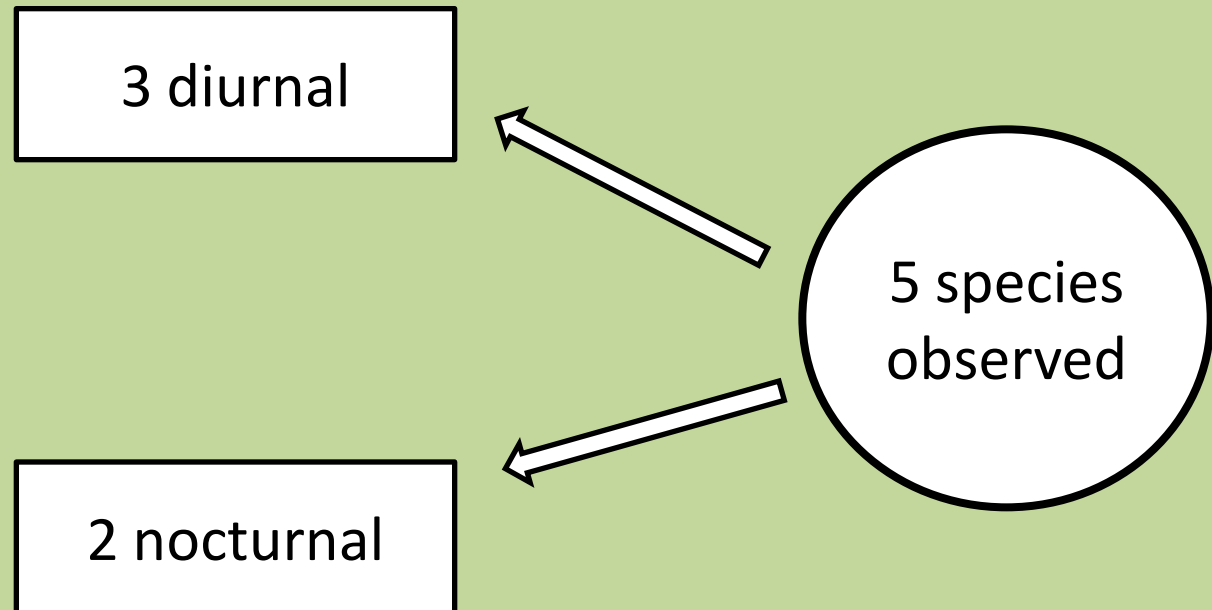
Akomba	Akomba	Valivehy	Akomba valiha	Tsintsihy	Fitsidika	?
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Area	Site no.							
1	1	(+)	-	(+)	+		(+)	
	2	-	(+)	+	(+)		(+)	
	3	(+)	-	(+)	+		(+)	
2	4	-	(+)	+	+	(+)	(+)	
	5	-	+	(+)	(+)	(+)	(+)	
	6	-	+	(+)	(+)	(+)	(+)	
3	7	(+)	-	(+)	+	(+)	+	+
	8	+	-	+	(+)	(+)	(+)	+

III.1 Lemur survey

III.1.1.Presence/absence of lemur species in the 8 study sites

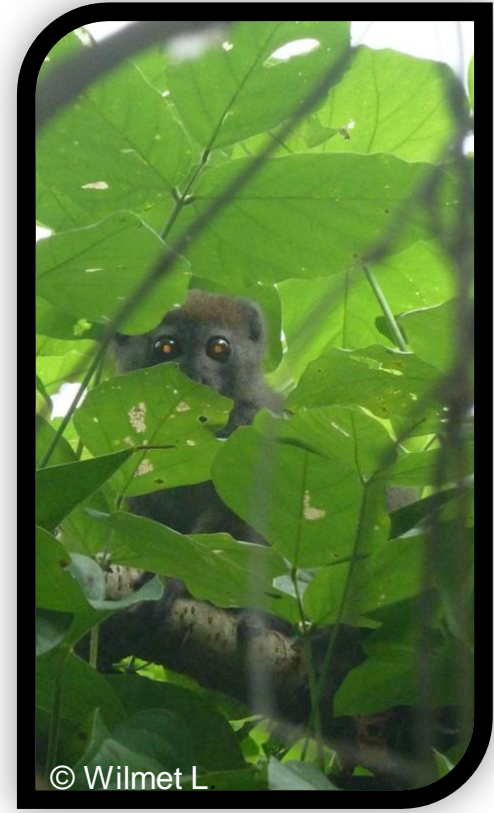
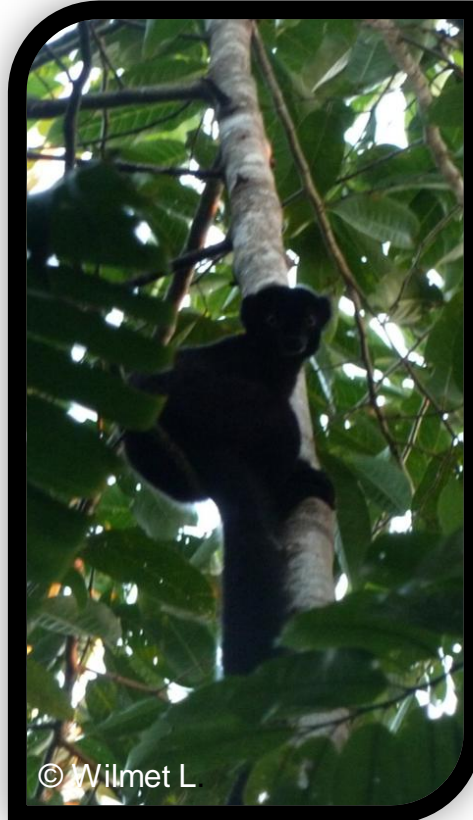
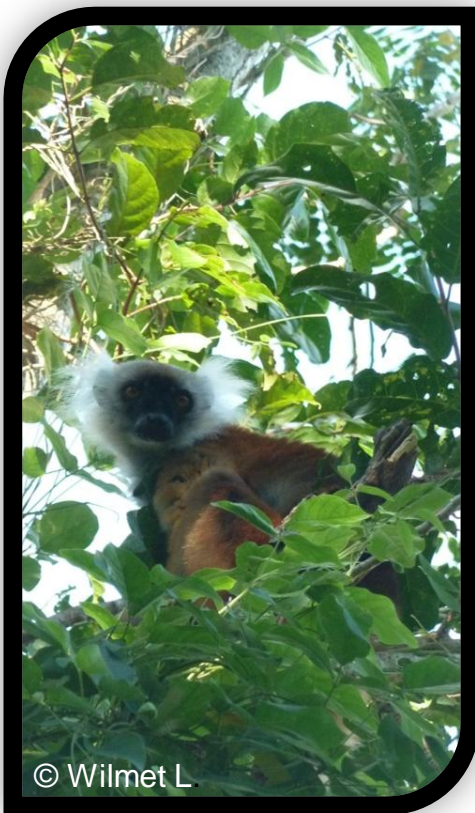
Scientific name						
<i>Eulemur macaco</i>	<i>Eulemur flavifrons</i>	<i>Mirza zaza</i>	<i>Hapalemur occidentalis</i>	?	<i>Lepilemur</i>	<i>Phaner parienti</i>



III.1 Lemur survey

III.1.1.Presence/absence of lemur species in the 8 study sites

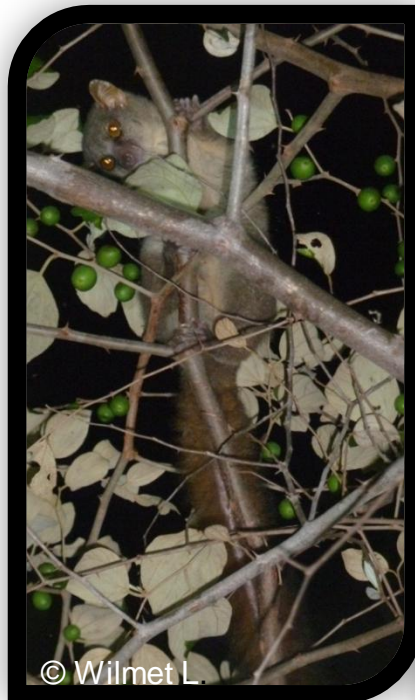
Scientific name						
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Scientific name						
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III.1 Lemur survey

III.1.1.Presence/absence of lemur species in the 8 study sites

Scientific name

*Eulemur
macaco*

*Eulemur
flavifrons*

*Mirza
zaza*

*Hapalemur
occidentalis*

?

Lepilemur

*Phaner
parienti*

Malagasy name

Akomba

Akomba

Valivehy

Akomba
valiha

Tsintsihy

Fitsidika

?

Area	Site no.							
1	1	(+)	-	(+)	+		(+)	
	2	-	(+)	+	(+)		(+)	
	3	(+)	-	(+)	+		(+)	
2	4	-	(+)	+	+	(+)	(+)	
	5	-	+	(+)	(+)	(+)	(+)	
	6	-	+	(+)	(+)	(+)	(+)	
3	7	(+)	-	(+)	+	(+)	+	+
	8	+	-	+	(+)	(+)	(+)	+



Area
1+3

L. o. ...



3

WHY?

Andranomalaza

1

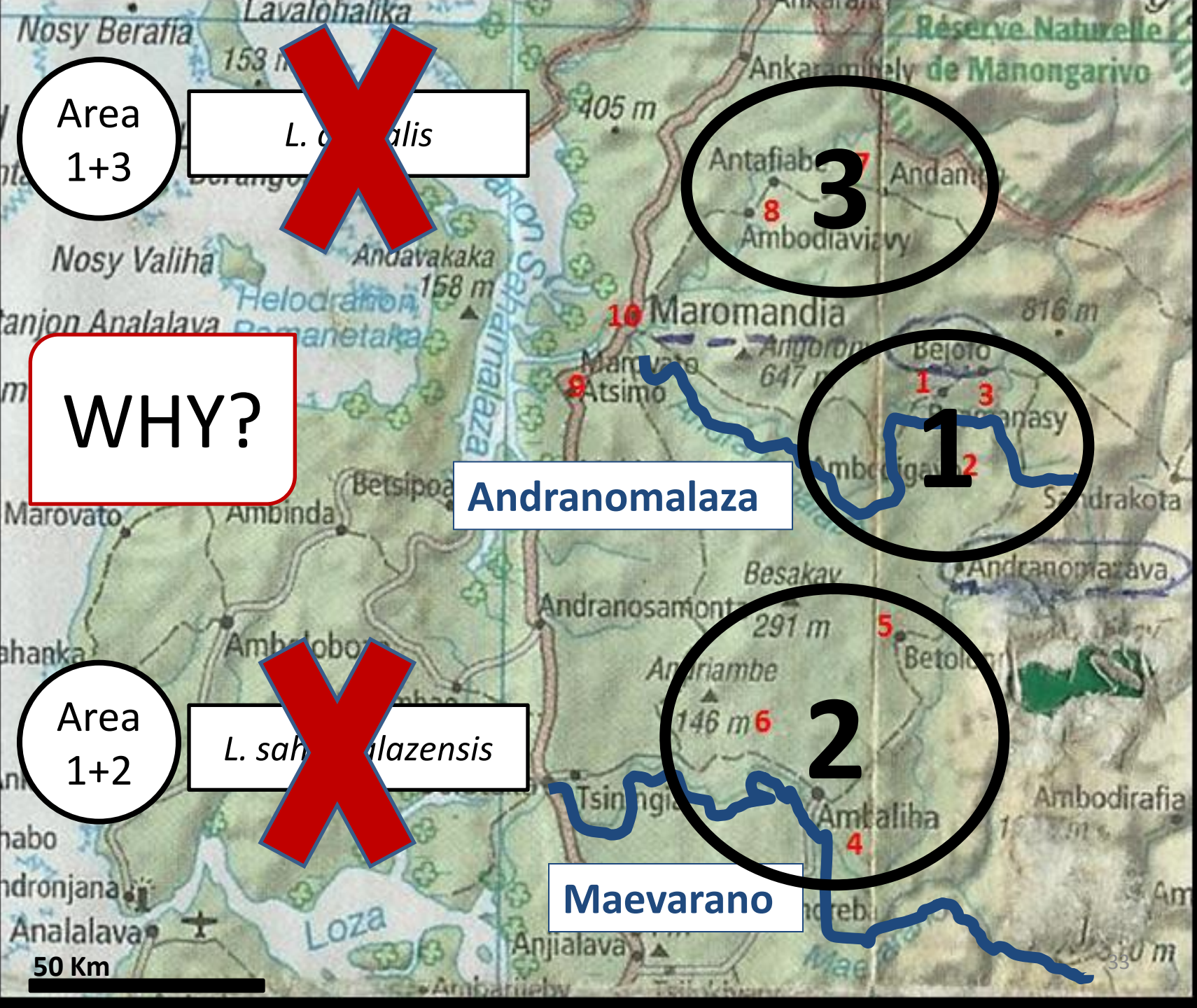
Area
1+2

L. sah ... lazensis



2

Maevarano



50 Km

IV.1 Lemur survey

		Scientific name	
		?	<i>Lepilemur</i>
		Malagasy name	
		Tsintsihy	Fitsidika
Area	Site no.		
1	1		(+)
	2		(+)
	3		(+)
2	4	(+)	(+)
	5	(+)	(+)
	6	(+)	(+)
3	7	(+)	+
	8	(+)	(+)

1. Local name



WHY?

IV.1 Lemur survey

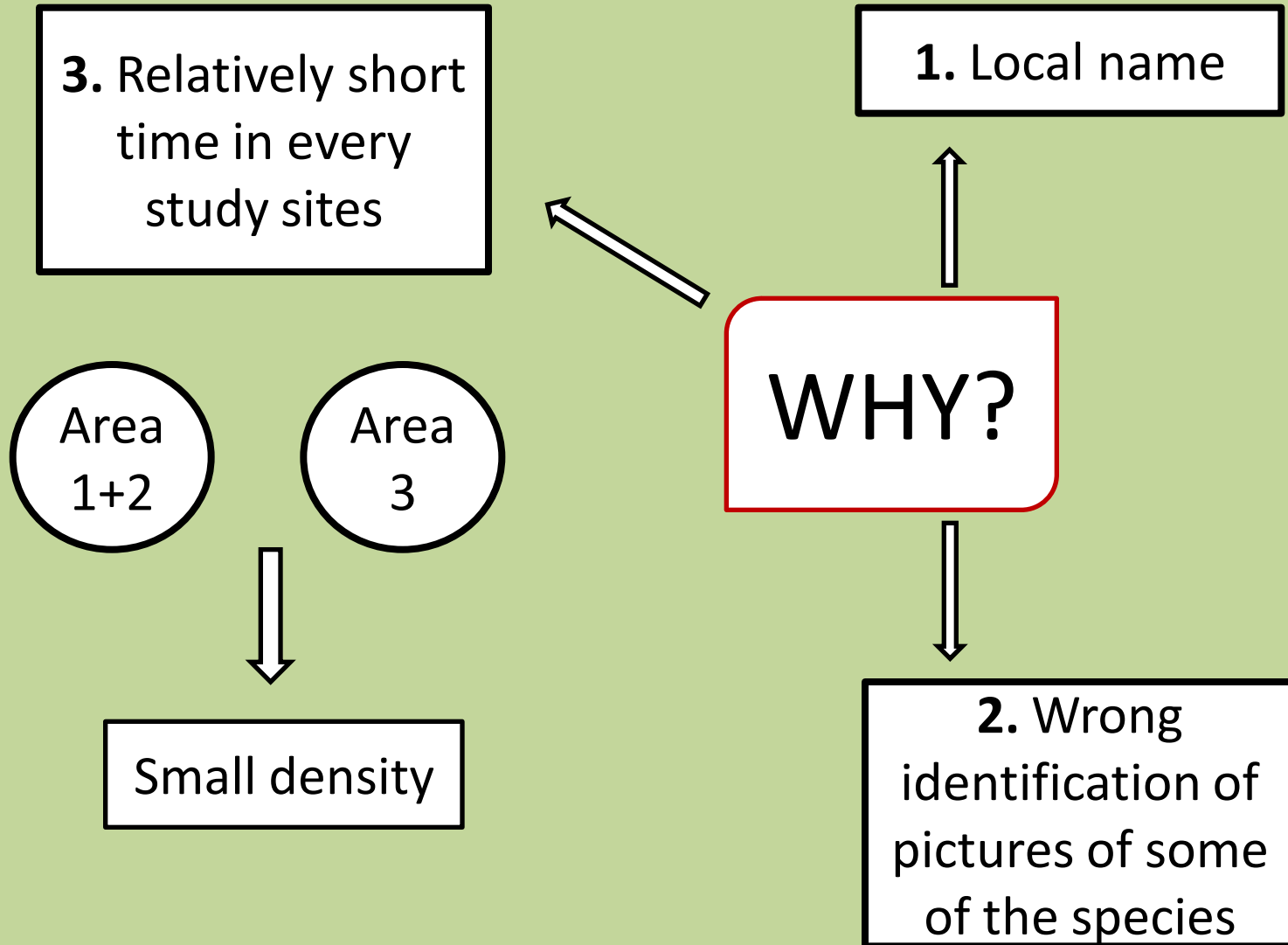
		Scientific name		
		?	<i>Lepilemur</i>	<i>Phanerparienti</i>
		Malagasy name		
		Tsintsihy	Fitsidika	?
Area	Site no.			
1	1		(+)	
	2		(+)	
	3		(+)	
2	4	(+)	(+)	
	5	(+)	(+)	
	6	(+)	(+)	
3	7	(+)	+	+
	8	(+)	(+)	+

1. Local name



WHY?

IV.1 Lemur survey



IV.1 Lemur survey

High
anthropogenic
pressure



Hunting

	Site no.	Hunting
Area 1 (13 days)	1	Yes
	2	No
	3	Yes
Area 2 (14 days)	4	No
	5	Yes
	6	Yes
Area 3 (10 days)	7	Yes
	8	Yes



© Wilmet L.

Trap for *Eulemur macaco*

IV.2 Forest characterization

High
anthropogenic
pressure



Deforestation



IV.2 Forest characterization



V. L. sahamalazensis

If there is still *L. sahamalazensis* in the hinterland of the peninsula



Densities in the forested area visited are not viable



Sahamalaza Peninsula is the only place where *L. sahamalazensis* occurs in viable population

V. L. sahamalazensis

**Sahamalaza Peninsula is the only place where
L. sahamalazensis occurs**

L. sahamalazensis = Critically
Endangered (IUCN Red List)



- More studies on this species
- Protocol of conservation for the species and their habitat



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Thank you for your attention



Laboratoire de Foresterie Tropicale et Subtropicale

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

References

- **Vences M., Wollenberg K.C., Vieites D.R., Lees D.C., 2009.** Madagascar as a model region of species diversification. *Trends in Ecology & Evolution* 24,8: 456-465.
- **Lei R., Engberg S. E., Andriantompohavana R., McGuire S. M., et al., 2008.** Nocturnal Lemur diversity at Masoala National Park. *Special Publication, Museum of Texas Tech University* 53:1-41.
- **Craul M., Zimmermann E., Rasoloharijaona S., et al, 2007.** Unexpected species diversity of Malagasy primates (*Lepilemur* spp.) in the same biogeographical zone: a morphological and molecular approach with the description of two new species. *BMC Evolutionary Biology* 7:83.