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Supplemental Text 1

Additional information regarding sampling design and techniques

Sampling results from the impossibility of collecting data over the entire area studied. For the present study, it is based on the establishment of transect lines installed so as to cover the majority of the study area. The latter was divided into two sampling areas according to the level of anthropogenic pressure exerted on the environment, which is defined as all the disturbances caused by humans and their activities (Irwin et al. 2010). For this, the zoning of the protected area already established was used: the core zone, a strictly protected zone, hence less human disturbance and the buffer zone, zone where various economic activities are permitted, hence a stronger disturbance.

Transects of approximately 1 km are installed in all existing forest blocks in a more or less parallel manner following the north direction of the compass. Each transect is spaced at least 200 m apart to avoid counting errors. Thus, 13 transects were obtained including 8 transects located in the core zone and 5 transects in the buffer zone, giving a total length of 12.9 km (Figure 2, Figure S1, S2). Transect lines are placed at least 24 hours before the start of the first observation to avoid any disturbance to the animals. Each 50 m interval of the transect line was marked with a colored ribbon to facilitate their identification and orientation during observations.

Additional Information regarding Canopydigi

Estimating the degree of canopy cover is important to see the relationship between a species and its habitat (Goodenough and Goodenough 2012). The photographic method is the most precise method to provide canopy cover estimates and is applied in this study (Paletto and Tosi 2009). The photos of the canopy were taken in the middle of each subplot (25 2 x 2 m) using a digit camera. These images are then analyzed with the free software Canopydigi developed by Goodenough and Goodenough (2012).

The images taken at the plots are polychrome and in JPEG format, while the software Canopydigi uses monochrome images with different shades of grey (256 shades of gray; 0 for black, 255 for white) and in BMP format. The free and open-source software ReaConverter Lite has been used for conversion. These monochrome images are converted into "false color" images by Canopydigi, in which dark pixels colored blue represent the canopy and pixels colored in red represent the sky. The user then chooses a threshold that is closest to the corresponding monochrome image. Finally, the software makes an automatic calculation and thus gives the percentage of canopy cover from these false color images. Once the canopy cover percentages are interpreted, they are classified into canopy groups designed by Ganzhorn et al. (1985): open (canopy coverage ≤ 20%), relatively open (21 – 50 %), semi-open (51 – 70 %), relatively closed (71 – 90 %), and closed (> 90 %).

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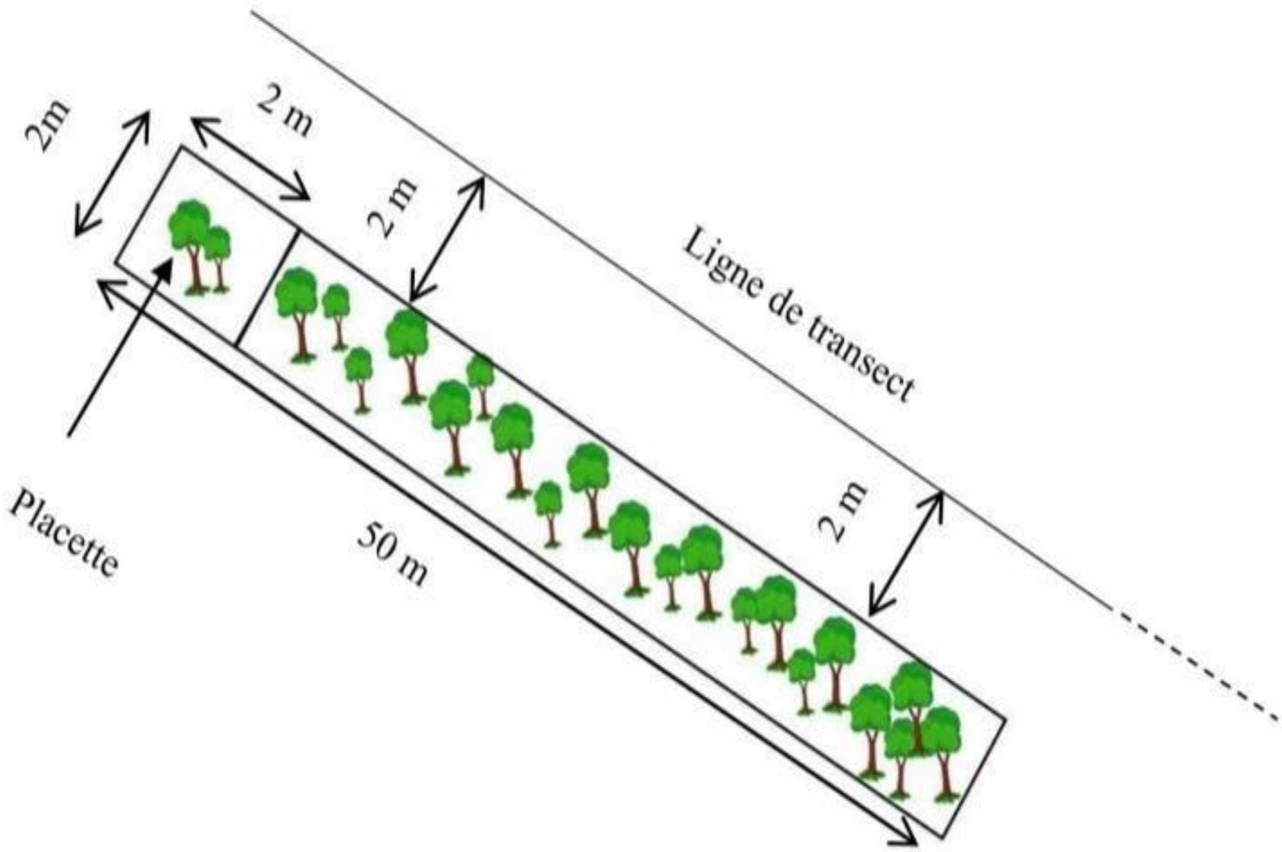

Figure S1. Diagram showing the device of the botanical plot used for the study of the habitat using the transect method by Braun-Blanquet (1995). (*Ligne de transect* for transect line, *placette* for small plots)

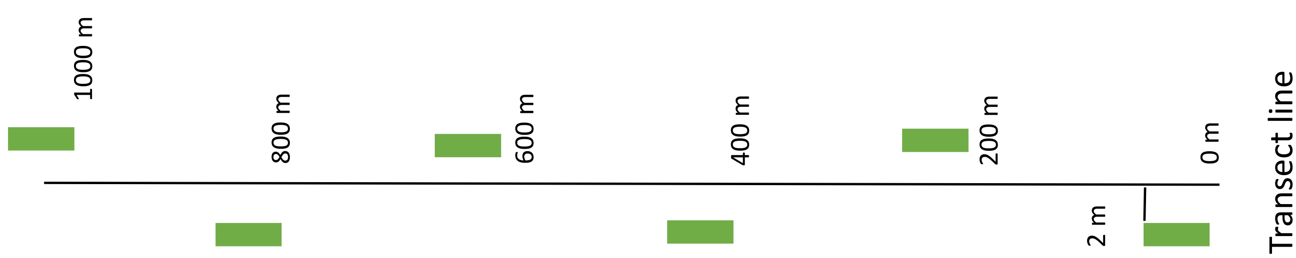

Figure S2. Schematic representation of vegetation plot sampling.

Table S1. Results from the density estimation models of *Avahi laniger*.

Key Function & Adj	Formula	CvM	Pa hat	se Pa hat	delta AIC
Half-normal	~1	0.67	0.63	0.10	0.00
Hazard-rate	~1	0.72	0.66	0.13	1.50
Half-normal with cosine adjustment term of order 2	~1	0.73	0.68	0.22	1.89
Half-normal with Hermite polynomial adjustment term of order 4	~1	0.71	0.66	0.19	1.95
Half-normal with simple polynomial adjustment term of order 4	~1	0.67	0.63	0.15	1.99
Hazard-rate with Hermite polynomial adjustment term of order 4	~1	0.72	0.66	0.20	3.50
Hazard-rate with simple polynomial adjustment term of order 4	~1	0.72	0.66	0.15	3.50
Hazard-rate with cosine adjustment term of order 2	~1	0.72	0.66	0.24	3.50
Half-normal with cosine adjustment terms of order 2,3	~1	0.66	0.63	0.22	3.66
Half-normal with simple polynomial adjustment terms of order 4,6	~1	0.68	0.63	0.21	3.92
Half-normal with Hermite polynomial adjustment terms of order 4,6	~1	0.71	0.66	0.23	3.96
Hazard-rate with simple polynomial adjustment terms of order 4,6	~1	0.72	0.68	0.18	5.40
Hazard-rate with Hermite polynomial adjustment terms of order 4,6	~1	0.70	0.65	0.22	5.45
Hazard-rate with cosine adjustment terms of order 2,3	~1	0.70	0.65	0.23	5.46
Half-normal	~scale_crown + scale_canopy	0.75	0.63	0.14	0.00
Half-normal	~scale_crown + scale_DBH	0.75	0.61	0.63	1.57
Half-normal	~crown_dist_m	0.87	0.73	0.16	1.97
Half-normal	~scale_crown + scale_canopy + scale_height	0.75	0.63	0.17	2.00
Half-normal	~1	0.67	0.79	0.13	2.94
Half-normal	~scale_crown + scale_canopy + scale_DBH	0.70	0.61	0.76	3.47
Half-normal	~scale_crown + scale_height	0.82	0.74	0.25	3.84
Half-normal	~zone	0.68	0.77	0.16	3.89
Half-normal	~max_height_m	0.71	0.75	0.12	3.95
Half-normal	~canopy_cover	0.66	0.77	0.13	3.96
Half-normal	~DBH_cm	0.70	0.82	0.15	4.67
Half-normal	~scale_canopy + scale_DBH	0.87	0.77	0.16	5.00

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Table S2. Total number of *Avahi laniger* on individual transects detected across the field season by forest zone.

Zone	**Transect #**	**Number of *A. laniger* (nighttime)**	**Encounter rates (number of individuals / km)**
CORE	T3	3	1.05
	T4	0	0
	T5	5	1.66
	T6	5	1.66
	T8	2	0.57
	T9	7	2.33
	T12	1	0.33
	T13	2	0.66
BUFFER	T1	4	1.66
	T2	4	1.33
	T7	10	3.33
	T10	6	2
	T11	9	3

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Table S3. Observed group of *Avahi laniger* in tree habitats across the study period. (daytime and nighttime observation, n= 39 observations)

Characteristics	**Classifications**	**Observed lemurs**
DBH class (cm)	2.5 – 5 6 – 10 11 – 20 21 – 30 > 30	0 7 24 5 3
Height class (m)	2 – 4 5 – 8 9 – 16 17 – 32	0 9 26 1
Canopy cover (%)	Open (< 20%) Relatively open (21-50%) Semi-open (51-70%) Relatively closed (71-90%) Closed (>90%)	0 3 26 7 0
Crown diameter (m)	Little (<5) Medium (5 – 10) Big (> 10)	22 12

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Table S4. Counts of observed trees by zone (identified at the genus level)

Family	Genus	Number of trees in CORE	Number of trees in BUFFER ZONE
ANACARDIACEAE	*Baronia*	9	1
	Micronychia	3	
ANNONACEAE	*Xylopia*	47	19
APHLOIACEAE	*Aphloia*	4	1
APOCYNACEAE	*Mascarenhasia*	10	4
ARALIACEAE	*Neocussonia*	1	1
ARECACEAE	*Dypsis*	5	
	Phloga (Dypsis)	1	
ASPARAGACEAE	*Dracaena*	22	1
ASTERACEAE	*Brachylaena*	15	
	Erigeron	16	
	Helichrysum	26	
ASTEROPEIACEAE	*Asteropeia*	17	2
BIGNONIACEAE	*Phyllarthron*	1	
BURSERACEAE	*Canarium*	12	4
CANNABACEAE	*Trema*	40	4
CELASTRACEAE	*Brexiella*	72	39
CLUSIACEAE	*Garcinia*	74	16
	Symphonia	34	6
CUNONIACEAE	*Weinmannia*	2	
EBENACEAE	*Diospyros*	18	5
ERICACEAE	*Philippia (Erica)*	2	
	Vaccinium	6	1
EUPHORBIACEAE	*Croton*	14	1
	Macaranga	15	3
FABACEAE	*Albizia*	29	6
	Cadia	4	
	Dalbergia	6	3
	Entada	23	3

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Family	Genus	Number of trees in CORE	Number of trees in BUFFER ZONE
	Phylloxylon	3	
	Viguieranthus	3	23
GENTIANACEAE	*Anthocleista*	14	1
HERNANDIACEAE	*Hernandia*	8	4
HYPERICACEAE	*Harungana*	7	1
	Psorospermum	1	1
LAURACEAE	*Aspidostemon*	10	
	Cryptocarya	78	27
	Ocotea	34	8
MALVACEAE	*Dombeya*	48	12
MORACEAE	*Ficus*	1	1
	Streblus	14	1
MYRICACEAE	*Morella (Myrica)*	1	
MYRTACEAE	*Eucalyptus*	1	
	Eugenia	37	17
	Psidium	2	
	Syzygium	172	35
PITTOSPORACEAE	*Pittosporum*	19	1
PROTEACEAE	*Dilobeia*	2	3
PUTRANJIVACEAE	*Drypetes*	20	2
RUBIACEAE	*Coffea*	2	1
	Gaertnera	8	
	Hyperacanthus	1	1
	Ixora	7	
	Peponidium	6	
	Psychotria	2	1
	Saldinia	1	
	Tarenna	5	1
RUTACEAE	*Vepris*	6	4
	Zanthoxylum	1	

Family	Genus	Number of trees in CORE	Number of trees in BUFFER ZONE
SALICACEAE	*Homalium*	10	1
	Scolopia	4	11
SAPINDACEAE	*Plagioscyphus*	17	
	Tina	21	7
	Tinopsis	21	
SAPOTACEAE	*Gambeya*	45	23
	Labourdonnaisia	47	53
SARCOLAENACEAE	*Rhodolaena*	19	
	Sarcolaena	24	
SOLANACEAE	*Solanum*	8	1
STILBACEAE	*Nuxia*	7	5
VIOLACEAE	*Rinorea*	1	
ANACARDIACEAE	*Baronia*	9	1
	Micronychia	3	
ANNONACEAE	*Xylopia*	47	19
APHLOIACEAE	*Aphloia*	4	1
APOCYNACEAE	*Mascarenhasia*	10	4
ARALIACEAE	*Neocussonia*	1	1
ARECACEAE	*Dypsis*	5	
	Phloga (Dypsis)	1	
ASPARAGACEAE	*Dracaena*	22	1
ASTERACEAE	*Brachylaena*	15	
	Erigeron	16	
	Helichrysum	26	
ASTEROPEIACEAE	*Asteropeia*	17	2
BIGNONIACEAE	*Phyllarthron*	1	
Total number of trees		**1,266**	**366**
Number of families		**39**	**32**
Number of genera		**71**	**46**

Table S5. Linear mixed effect model results for habitat characteristics per zone. Three separate models were ran (model 1 = DBH ~ zone, model 2 = Crown distance ~ zone, model 3: Max height ~ zone) with the random effect genera.

	DBH	Crown distance	Max height
Buffer Zone	8.39 (0.42)	2.39 (0.10)	6.55 (0.19)
Core Zone	7.56 (0.34)	2.40 (0.08)	7.12 (0.15)
SD (Intercept sci_name)	2.42	0.51	1.00
SD (Observations)	4.94	1.30	2.52
Number of observations	1632	1632	1632
R2 Marg.	0.004	0.000	0.008
R2 Cond.	0.197	0.133	0.143
AIC	9967.5	5601.4	7751.5
BIC	9989.1	5622.9	7773.1
ICC	0.2	0.1	0.1
RMSE	4.86	1.28	2.48

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