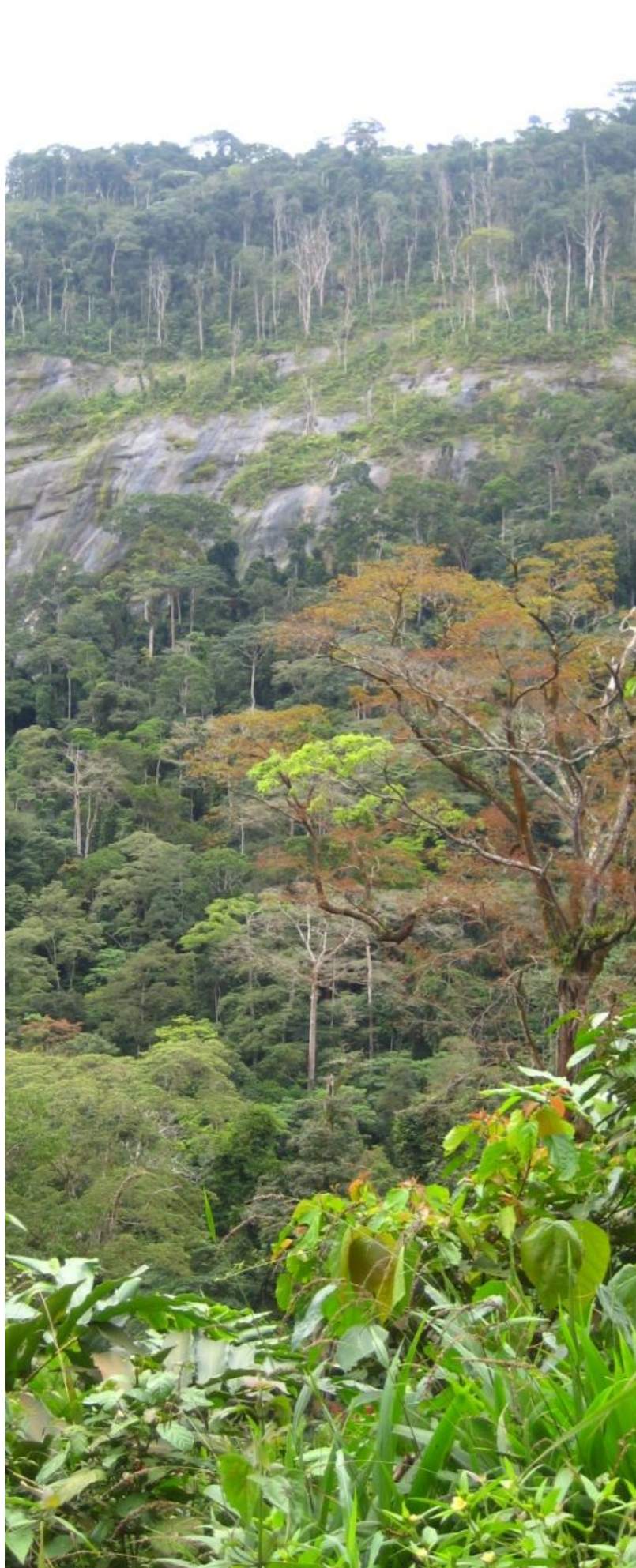


Equatorial Guinea's Economic Boom:

Effects on Apes & Elephants

ABCG/CI Presentation

CI Headquarters
Arlington, VA
January, 2012



Presentation Outline

- CI's mission
- Background on Equatorial Guinea (EG)
- CI in EG
- Background on apes and elephants in EG
- Nationwide survey on apes and elephants:
 - Objectives
 - Methodology
 - Preliminary results
 - Initial conclusions
- Economic and social systems:
Recommendations towards a green economy
- Next steps
- Acknowledgements
- Questions

CI's Mission:

Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity.



Ecosystem
Health

Ecosystem
Services

Human
Wellbeing

Background on EG:

- 28,050 km²
- Population: 668,225 (July 2011 est.)
- GDP per capita (PPP): \$19,300 (2011 est.)
- Industry: 91.7% of GDP; Agriculture: 3.4%; services 4.9% (2011 est.)
- Main natural resources: petroleum (oil production 322,700 bbl/day (2010 est.), natural gas, timber
- “2020” Development Plan: diversification



Context: Economic Growth

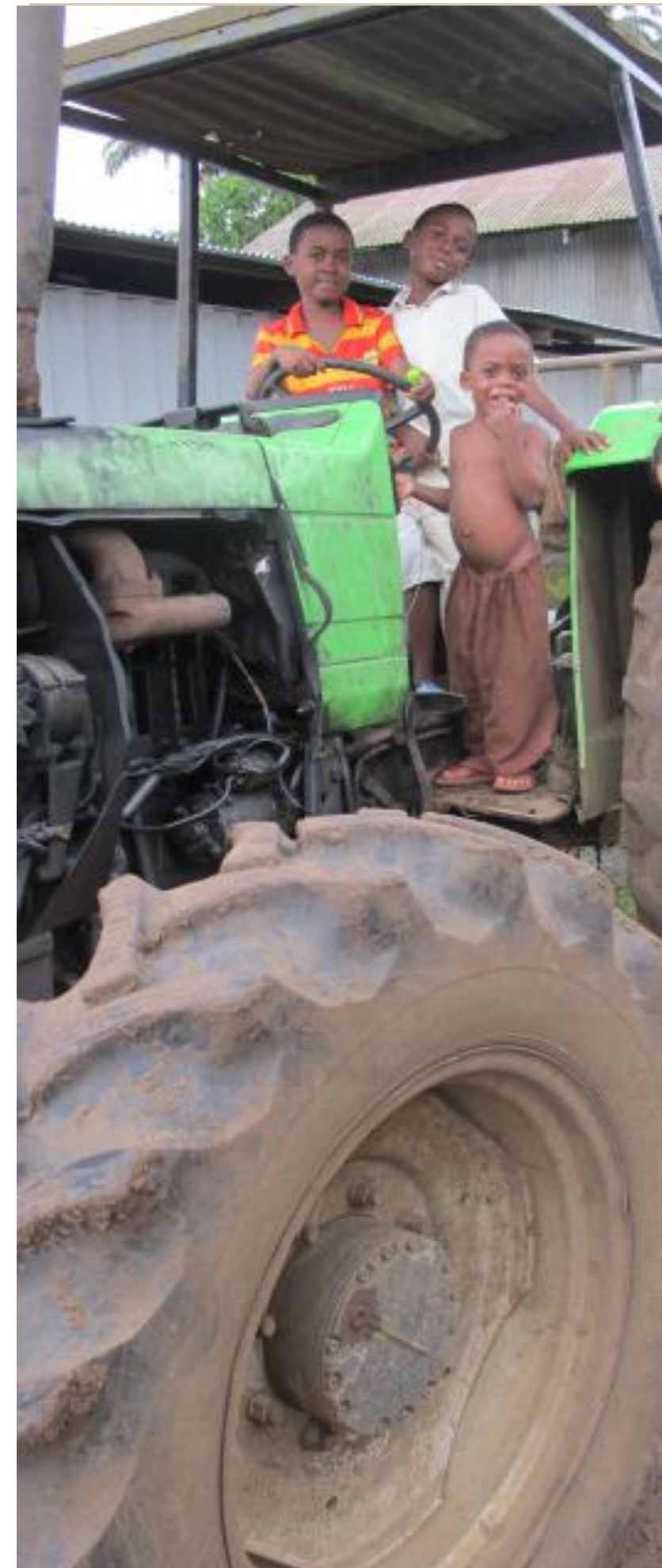
GDP per person*

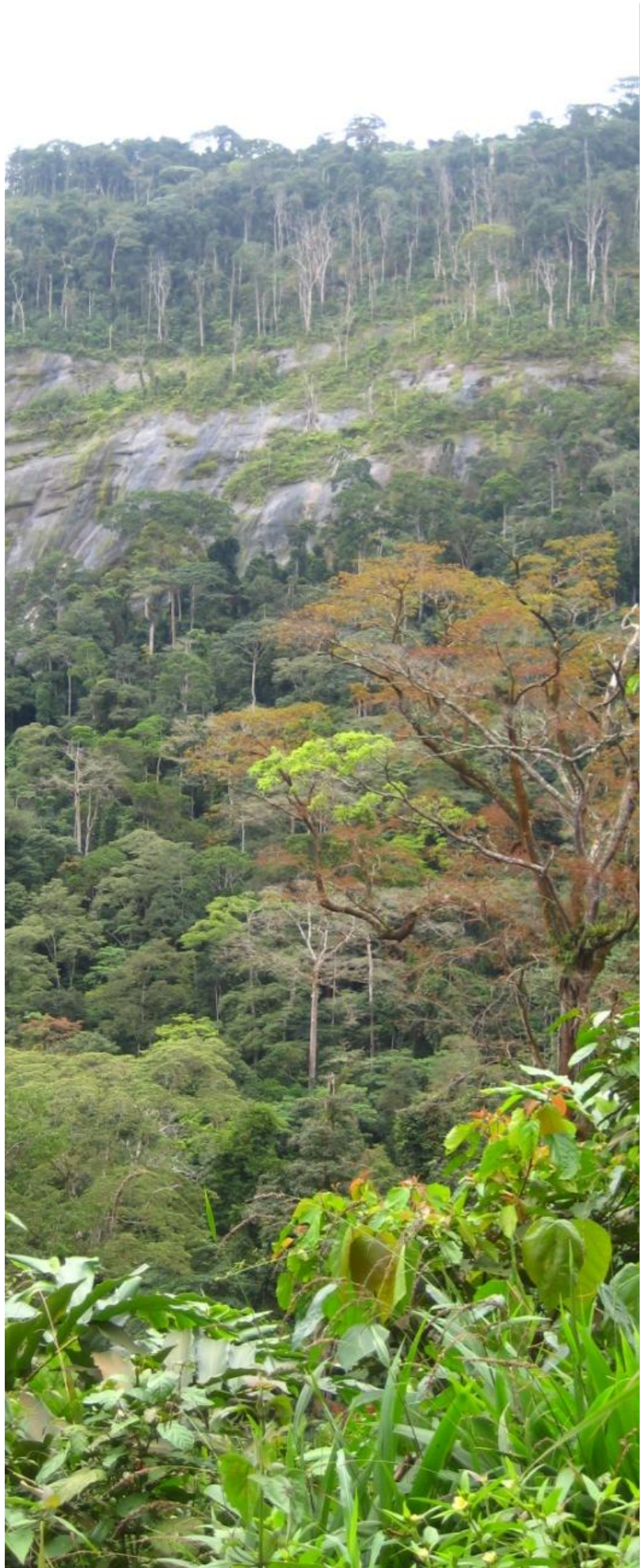
Average annual % change, 2001-10



Sources: IMF; *The Economist*

* At constant prices





Context: Natural Capital

Opportunities:

- Forests include 'Pleistocene Refuges' which may be climatically stable with potential for resilience in face of global warming (Leal 2009)
- Ecosystem services include provision of water and food (incl. bushmeat), carbon storage, etc.

Challenges:

- Little information about EG's species and/or ecosystem services
- Poor enforcement of environmental laws, including in protected areas; typically no EIAs
- Rural poverty widespread



Economic Growth and Conservation: Bridging the Gap

Opportunities:

- Large current investment in development → could become directed towards sustainability
- Desire for “Green industrialization” discussed at recent national industrialization conference

Challenges:

- Little is known about conservation, the importance of healthy ecosystems, and their value in providing ecosystem services
- Few viable alternatives (protein/jobs)
- Corruption, lack of capacity, lack of enforcement, etc.



Economic Growth and Conservation: Bridging the Gap

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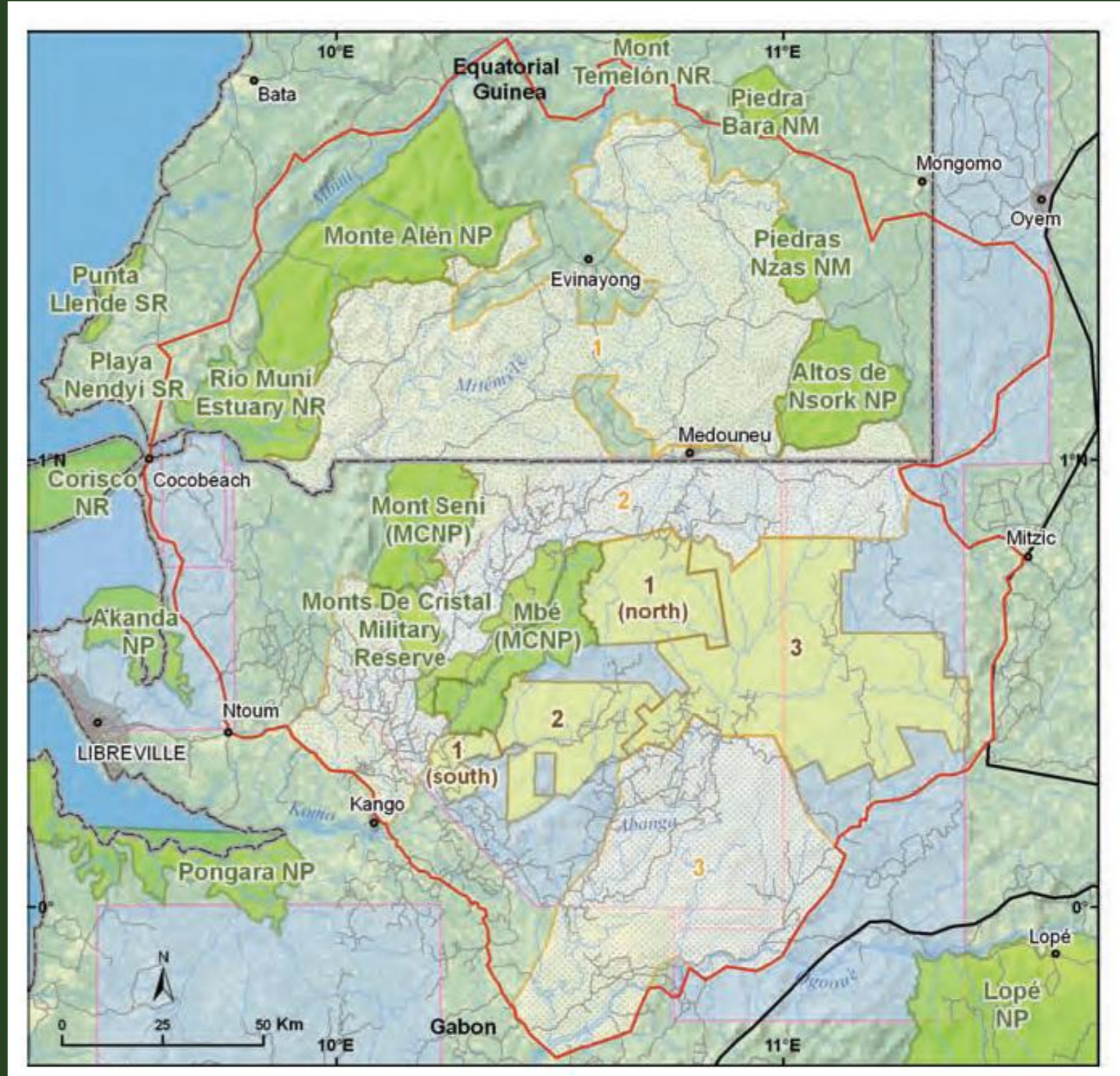
- Little is known about conservation, the importance of healthy ecosystems, and their value in providing ecosystem services
- Few viable alternatives (protein/jobs)
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→ We need to obtain and disseminate biological information, prioritize conservation areas, build capacity, and use this to promote conservation and sustainable development by 2020

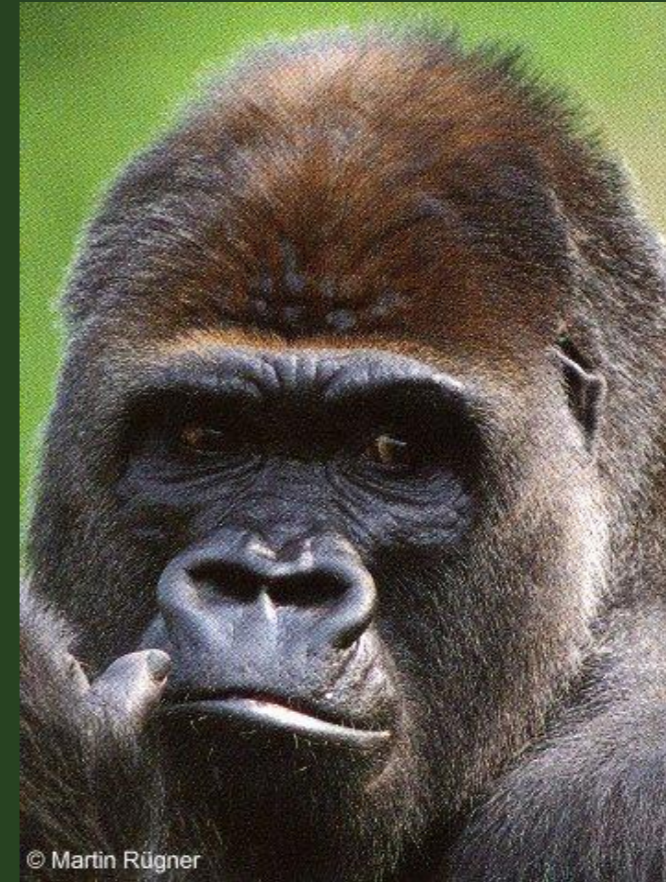
Conservation International Equatorial Guinea



USAID/CARPE Landscape 1: Monte Alén – Monts de Cristal



In the face of rapid development, what is the status of wildlife in EG?

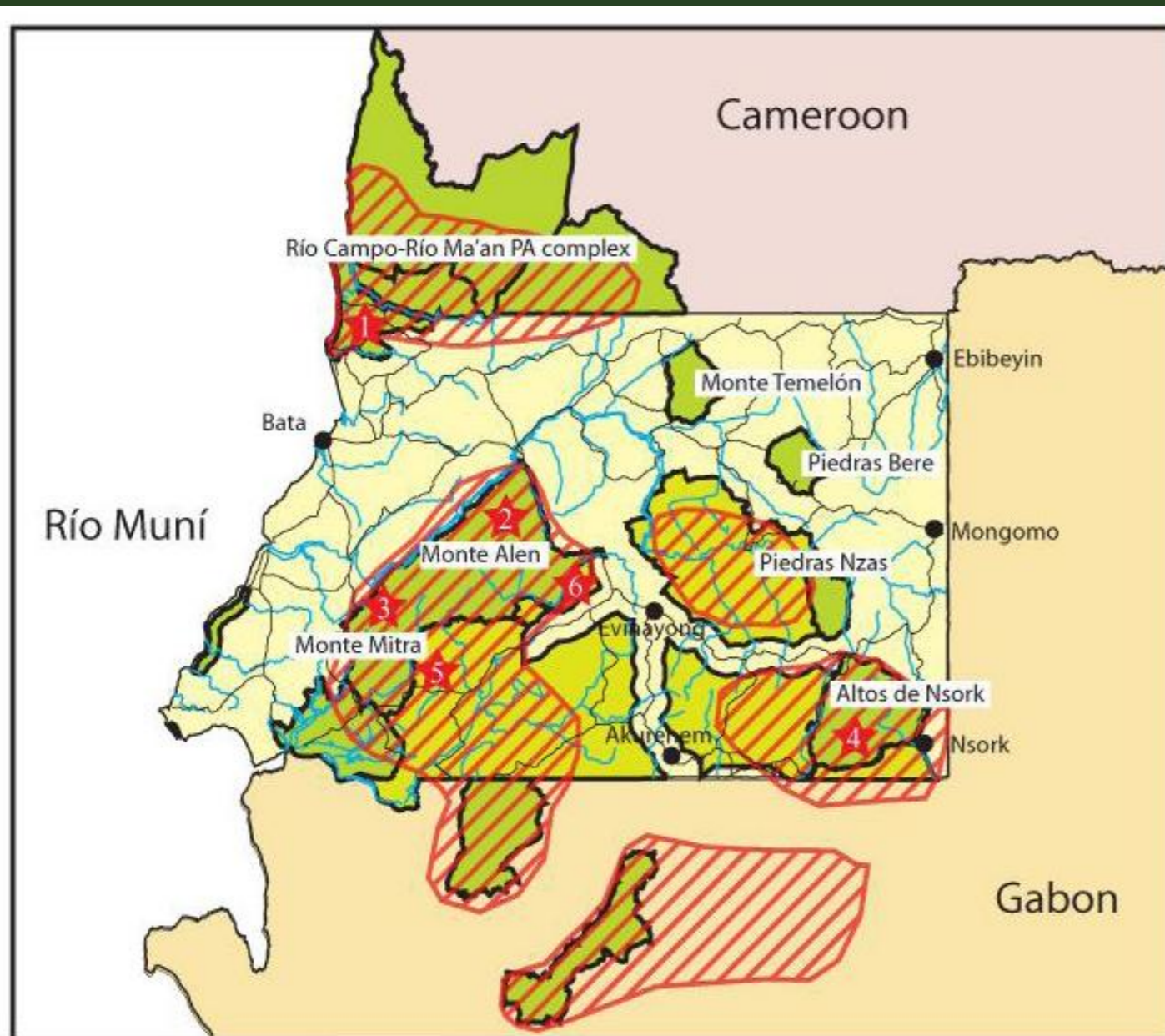


Distribution of chimpanzees



Source: www.greenpassage.org

Presence of chimpanzees (*P. troglodytes troglodytes*) in EG



- ★ Sabater Pi and Jones 1967; Gonzalez-Kirchner (1997); Larison et al 1999; Alers and Blom (1988)
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 - ★ Sabater Pi and Jones 1967; Gonzalez-Kirchner (1997); Larison et al 1999; Kümpel (2006); Kümpel et al (2008); ECOFAC unpublished 2004; Sunderland 2005
 - ★ Gonzalez-Kirchner (1997); Larison et al 1999
 - ★ Rist (2007)
 - ★ Gonzalez-Kirchner (1997)
- ▨ Locally reported chimpanzee populations

Status:

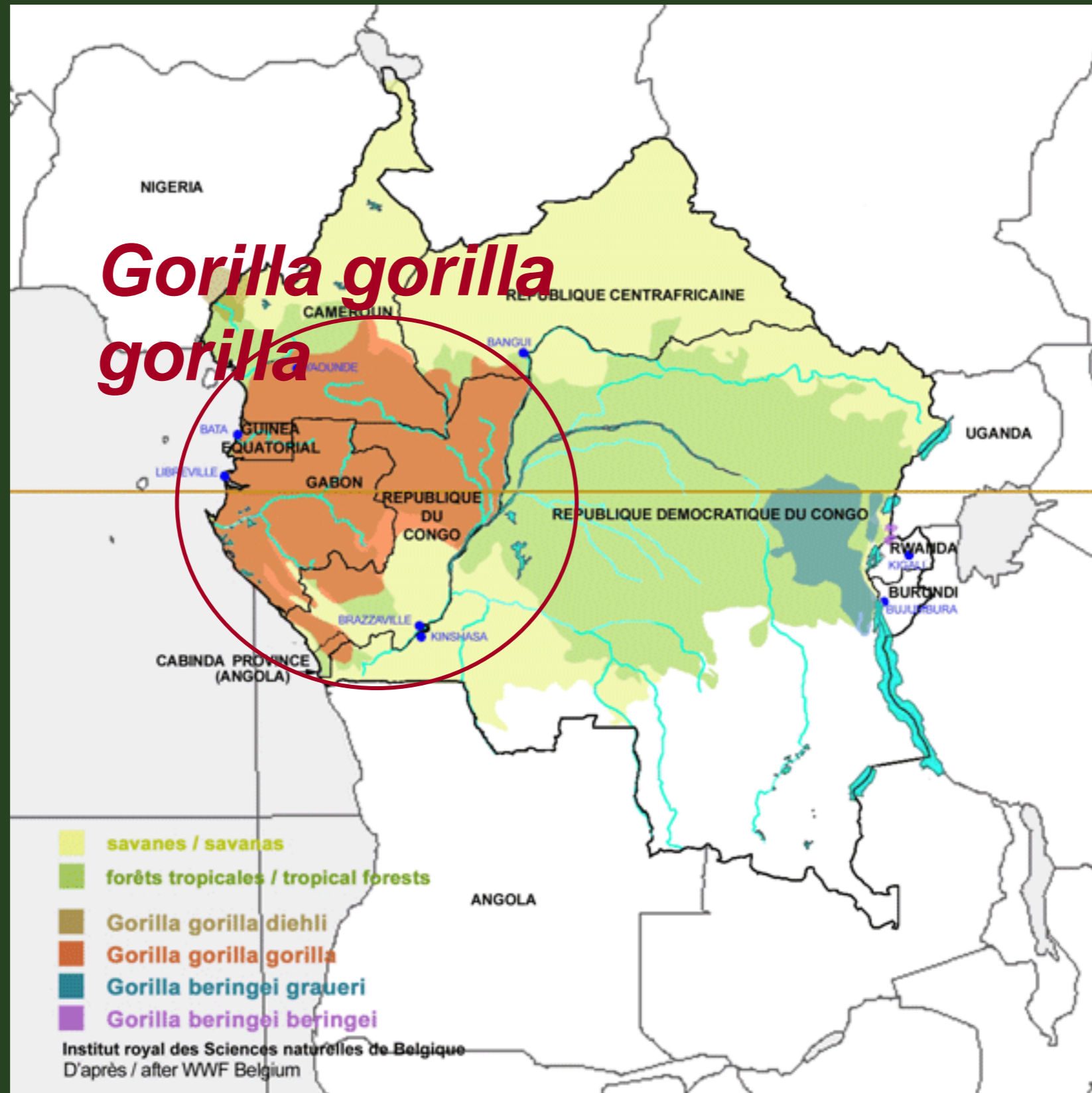
- Vulnerable (IUCN, 1996)
- **Threatened (IUCN, 2008)**

Some studies between 1960 and 1990 demonstrated declines of up to 20-25% of some ape populations in EG.

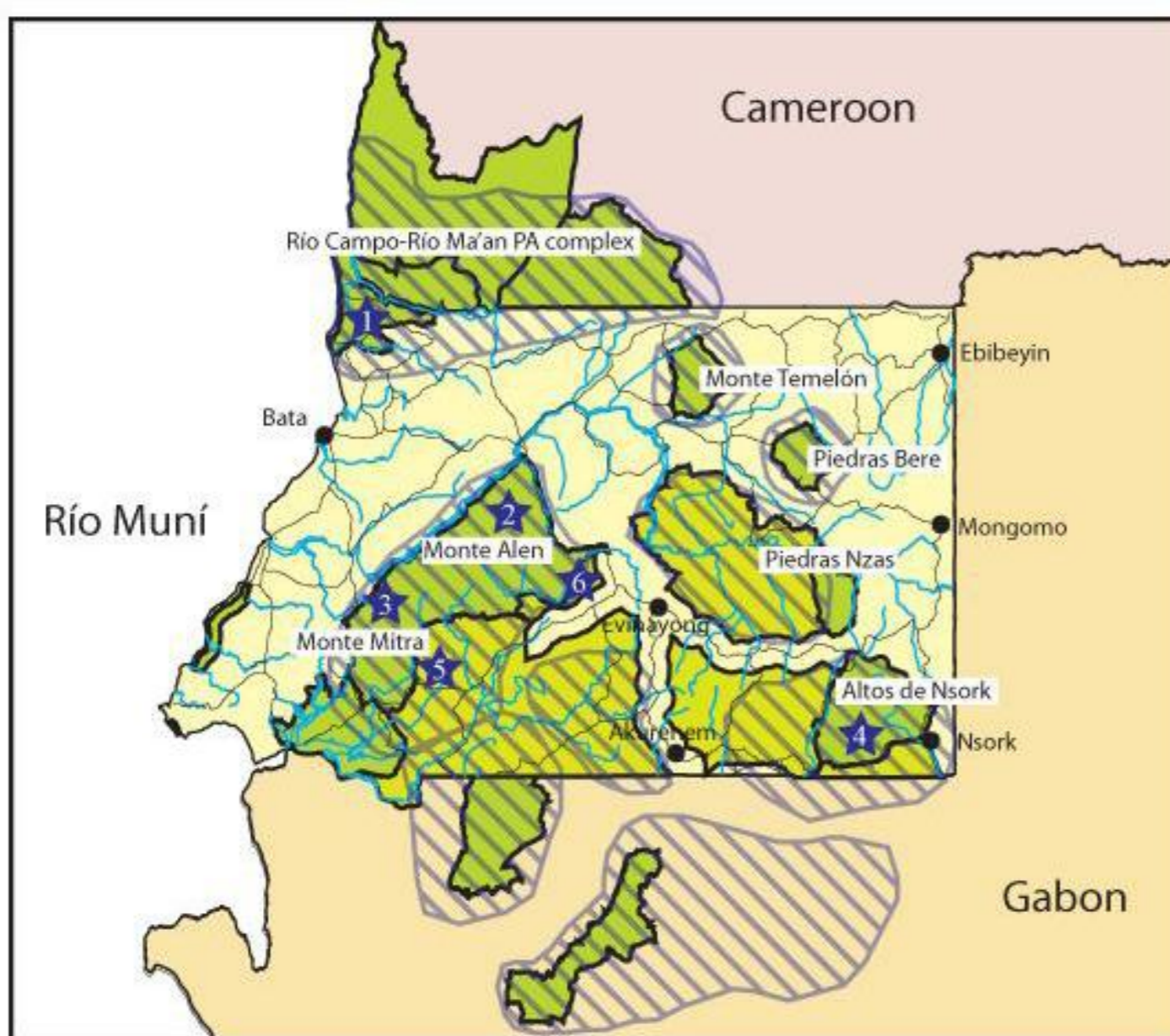


© Ape Action Alliance

Distribution of gorillas



Presence of gorillas (*G. gorilla gorilla*) in EG



- ★ 1 Sabater Pi and Jones 1967; Gonzalez-Kirchner (1997); Larison et al 1999; Alers and Blom (1988)
- ★ 2 Sabater Pi and Jones 1967; Gonzalez-Kirchner (1997); Garcia and Mba 1997
- ★ 3 Sabater Pi and Jones 1967; Gonzalez-Kirchner (1997); Larison et al 1999; Kumpel (2006); Kumpel et al (2008); ECOFAC unpublished 2004; Sunderland 2005
- ★ 4 Gonzalez-Kirchner (1997); Larison et al 1999
- ★ 5 Rist (2007)
- ★ 6 Gonzalez-Kirchner (1997)

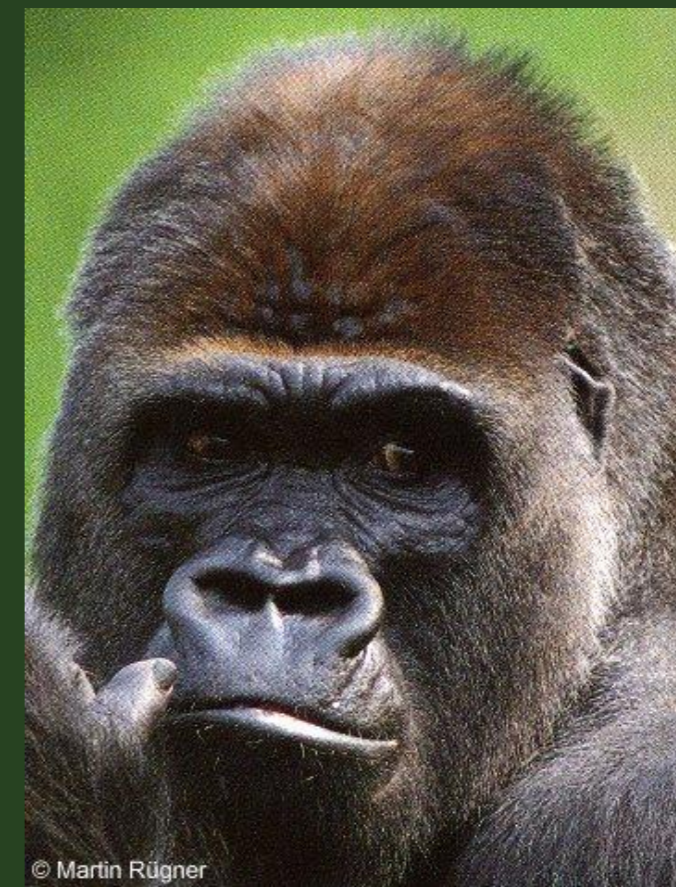
 Locally reported gorilla populations



Status:

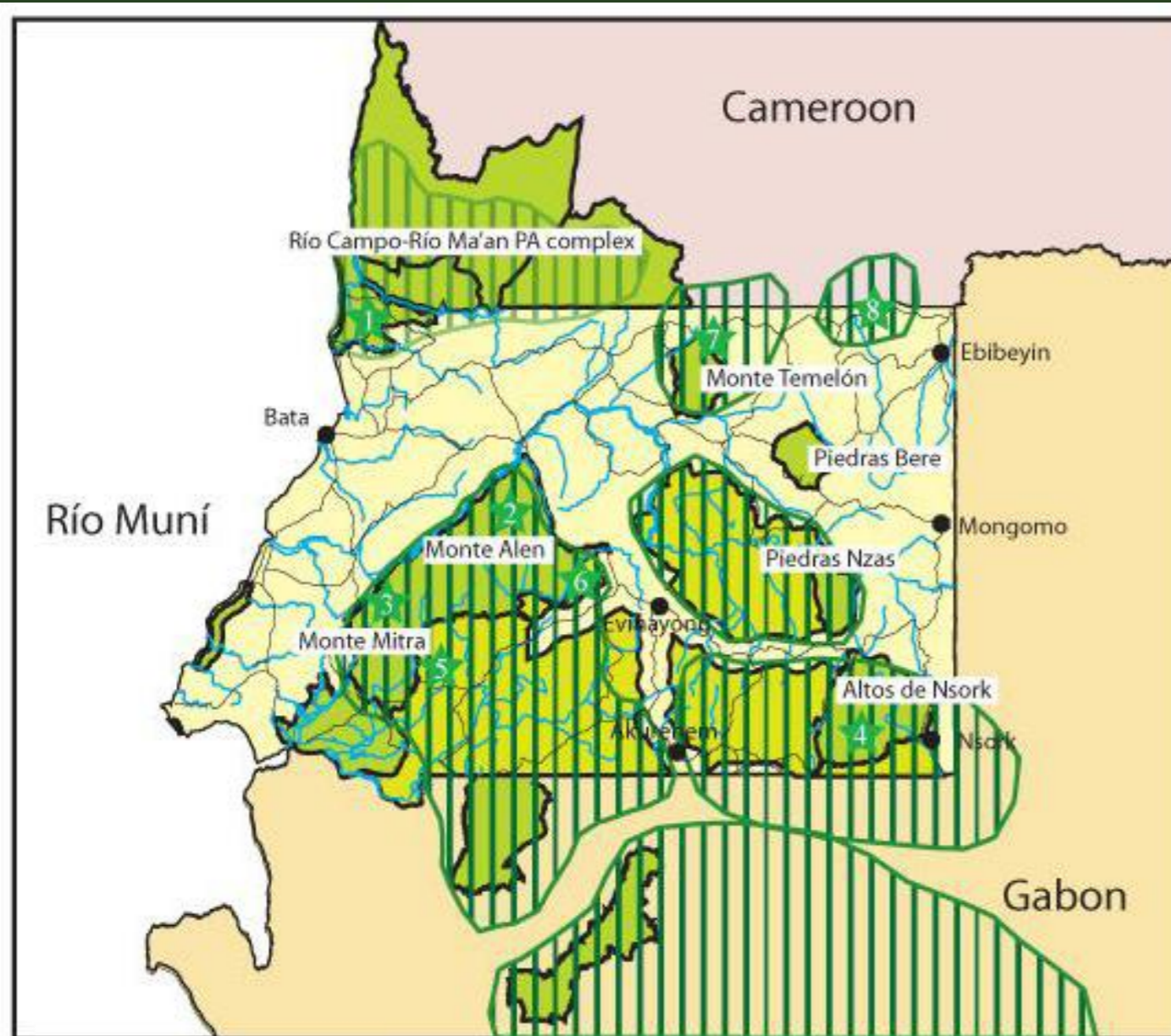
- Threatened (IUCN, 2007)
- **Critically endangered (IUCN, 2008)**

The Rio Campo Natural Reserve in northwestern EG was designated as a priority conservation area for gorillas.



© Martin Rügner

Presence of elephants (*L. cyclotis*) in EG



- ★ 1 Larison et al 1999; Alers and Blom (1988)
- ★ 2 Alers and Blom (1988); CI unpublished (2004)
- ★ 3 Larison et al 1999; CI unpublished (2005); Sunderland 2005
- ★ 4 Larison et al 1999; Sabater Pi personal communication (2008)
- ★ 5 Alers and Blom (1988); CI unpublished (2004)
- ★ 6 no data
- ★ 7 Sabater Pi personal communication (2008)
- ★ 8 Sabater Pi personal communication (2008)

 Locally reported elephant populations



Status:

- Regionally (i.e. in Central Africa) classified as **Endangered (IUCN, 2007)**

Human-elephant conflict (HEC) appears to be a serious threat in EG



© Jessica Junker, MPI

Difficulties Estimating Populations: e.g. Elephants in EG

CENTRAL AFRICA: COUNTRY AND REGIONAL TOTALS & DATA QUALITY

COUNTRY	ELEPHANT NUMBERS				RANGE AREA (km ²)	% OF REGIONAL RANGE	% OF RANGE ASSESSED	IQI ¹	PFS ²
	DEFINITE	PROBABLE	POSSIBLE	SPECULATIVE					
Cameroon	179	726	4,965	9,517	118,571	12	45	0.03	1
Central African Republic	109	1,689	1,036	500	73,453	8	95	0.51	2
Chad	3,885	0	2,000	550	149,443	15	26	0.15	1
Congo	402	16,947	4,024	729	135,918	14	23	0.18	1
Democratic Republic of Congo	2,447	7,955	8,855	4,457	263,700	27	40	0.18	1
Equatorial Guinea	0	0	700	630	15,008	2	13	0.00	2
Gabon	1,523	23,457	27,911	17,746	218,985	22	94	0.33	1
TOTAL*	10,383	48,936	43,098	34,129	975,079	29	52	0.22	1

Difficulties Estimating Populations: e.g. Elephants in EG

EQUATORIAL GUINEA: ELEPHANT ESTIMATES

INPUT ZONE	CAUSE OF CHANGE ¹	SURVEY DETAILS ²			NUMBER OF ELEPHANTS		SOURCE	PFS ³	AREA (km ²)	MAP LOCATION	
		TYPE	RELIAB.	YEAR	ESTIMATE	95% C.L.				LONG.	LAT.
Monte Alén National Park	—	OG3	E	2002	300		S. Engonga, pers. comm., 2002	2	800	10.2 E	1.6 N
Montes Mitra Sector, Monte Alén National Park	NP	DC3	D	2004	700	330*	Puit & Ghiurghi, 2007	2	1,200	10.0 E	1.4 N

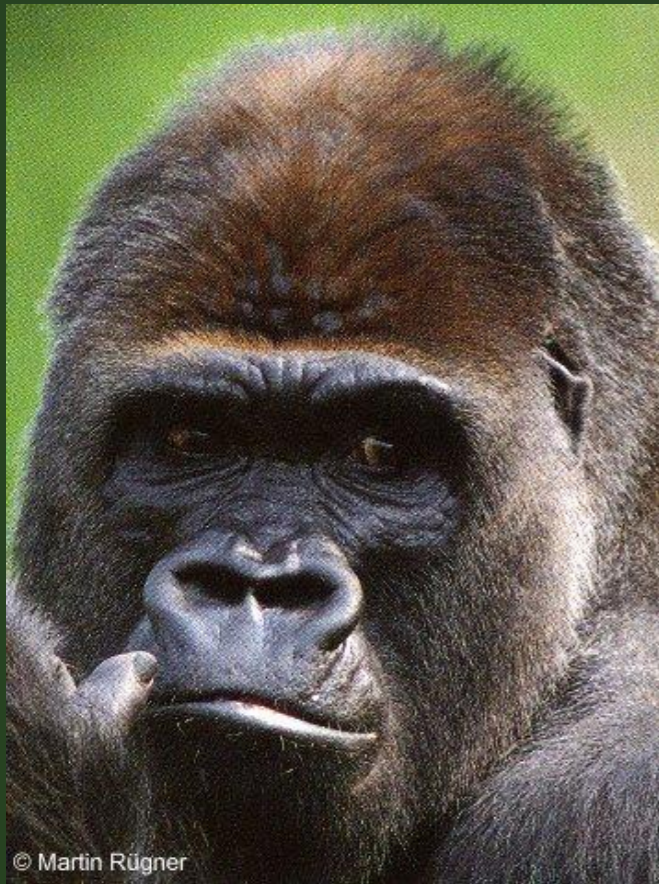
* Range of informed guess

¹ Key to Causes of Change: DA: Different Area; DD: Data Degraded; DT: Different Technique; NA: New Analysis; NG: New Guess; NP: New population; PL: Population Lost; RS: Repeat Survey (RS' denotes a repeat survey that is not statistically comparable for reasons such as different season); —: No Change

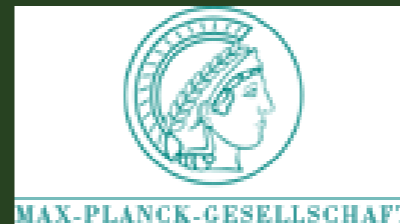
² Key to Survey Types: AS: Aerial Sample Count; AT: Aerial Total Count; DC: Dung Count; GD: Genetic Dung Count; GS: Ground Sample Count; GT: Ground Total Count; IG: Informed Guess; IR: Individual Registration; OG: Other Guess. Survey Type is followed by an indicator of survey quality, ranked from 1 to 3 (best to worst). Survey Reliability is keyed A-E (best to worst)

³ PFS: Priority for Future Surveys, ranked from 1 to 5 (highest to lowest). Based on the precision of estimates and the proportion of national range accounted for by the site in question, PFS is a measure of the importance and urgency for future population surveys. All areas of unassessed range have a priority of 1. See Introduction for details on how the PFS is derived.

Nationwide survey for apes and elephants in EG



Participants: Anthony Agbor, Antoine Berlemont, Geneviève Campbell, Agustin Ebana, Cayetano Ebana, Juan Antonio Edjang, Diosdado Esono, Hjalmar Kühl, Santiago Mba, Domingo Mbomio, Mizuki Murai, Jose Nsue, Benjamin Nvele, Antonio Nze, Mariano Obama, Bonifacio Owono, Fernando Owono, Heidi Ruffler



Nationwide Survey for Apes and Elephants in EG



Objectives of nationwide survey:

- Obtain an estimation of abundance, density and distribution of great apes and elephants in Equatorial Guinea
- Identify main threats to their populations
- Use these data to identify priority conservation sites and activities, and to establish conservation action plans for apes and elephants in EG
- Build capacity among national staff to enable long-term monitoring and adaptive management



© Heidi Ruffler

Preliminary Study: Nest and Dung Decay Rates



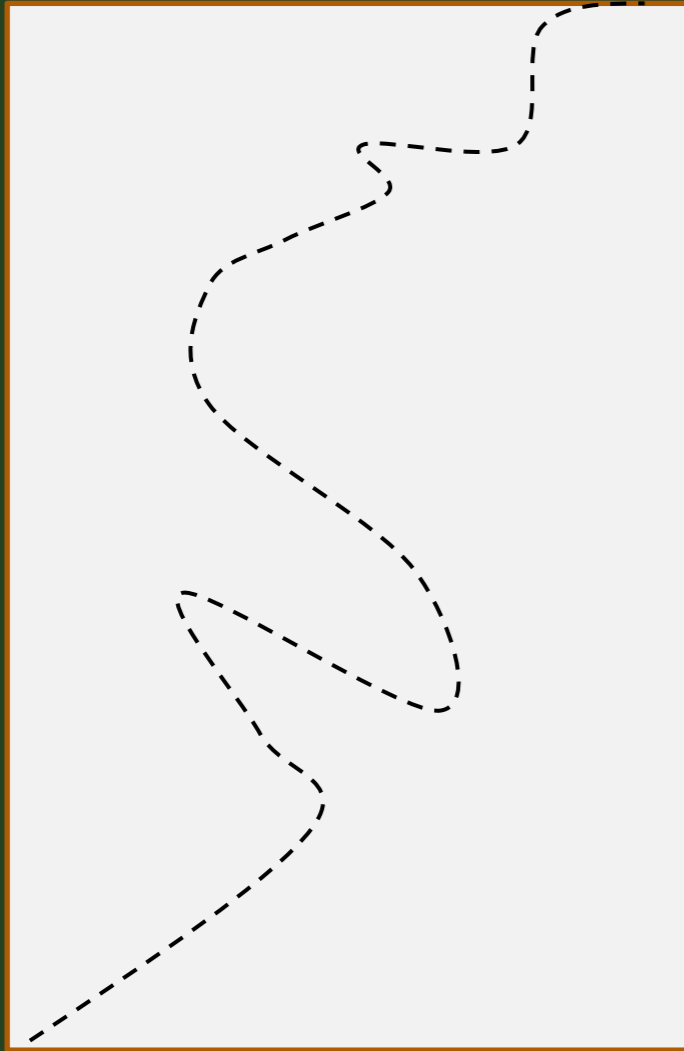
- Difficult to use direct sightings for animals, therefore use indirect signs (nests and feces)
- Need to know production rate and to determine local decay rate of nests and feces to convert indirect signs into actual abundance

Above:
Fresh chimpanzee nest (level 1)

Right:
Elephant feces: level 2 (left) and
level 3 (right)

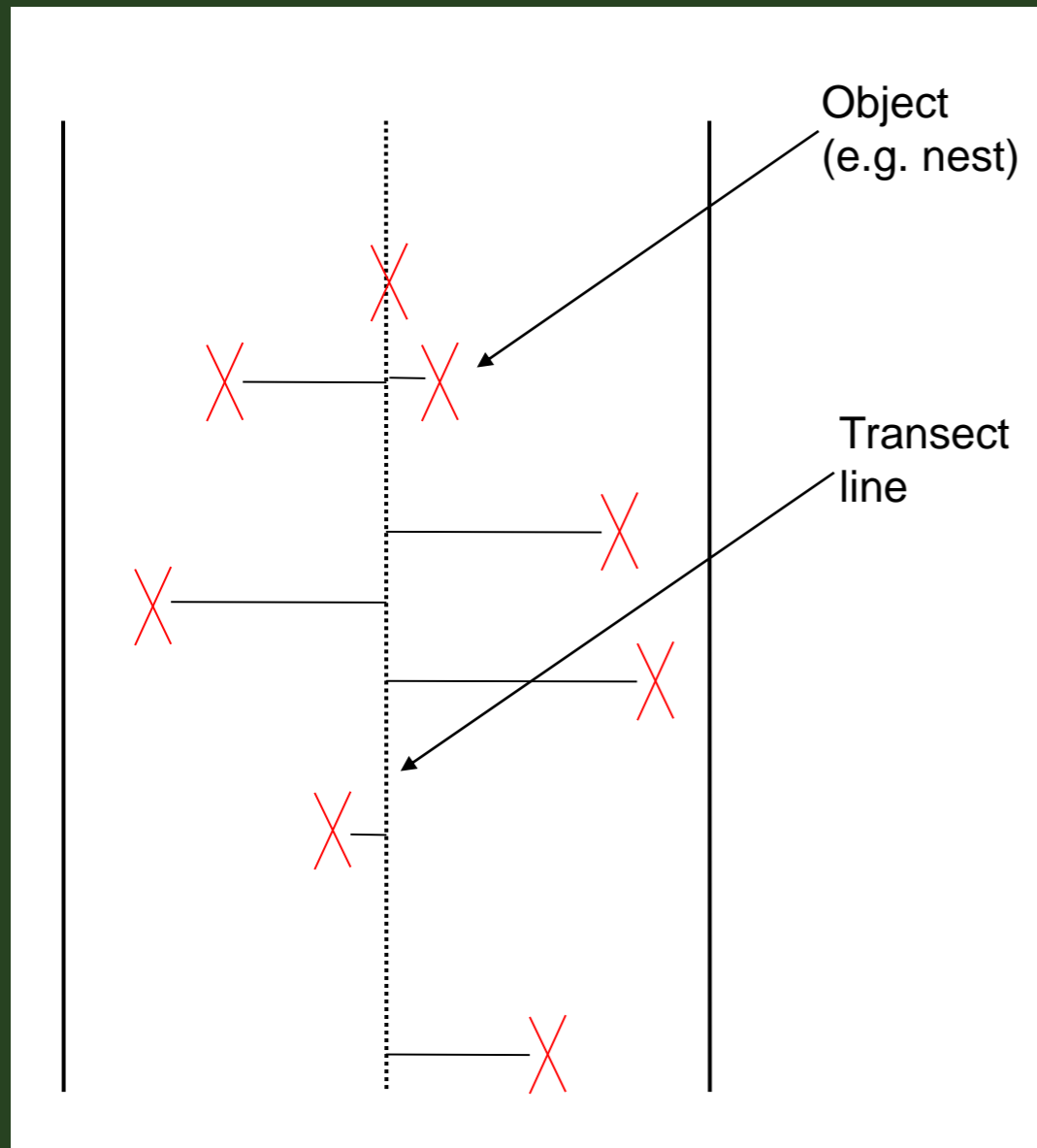


Nest and Dung Decay Rates: Recce transects



- “Path of least resistance” (not representative)
- We used Recce transects to search for fresh nests and dung for the preliminary decay rate study, and to obtain more information about the presence of animals

Estimating abundance, density and distribution: Line transects

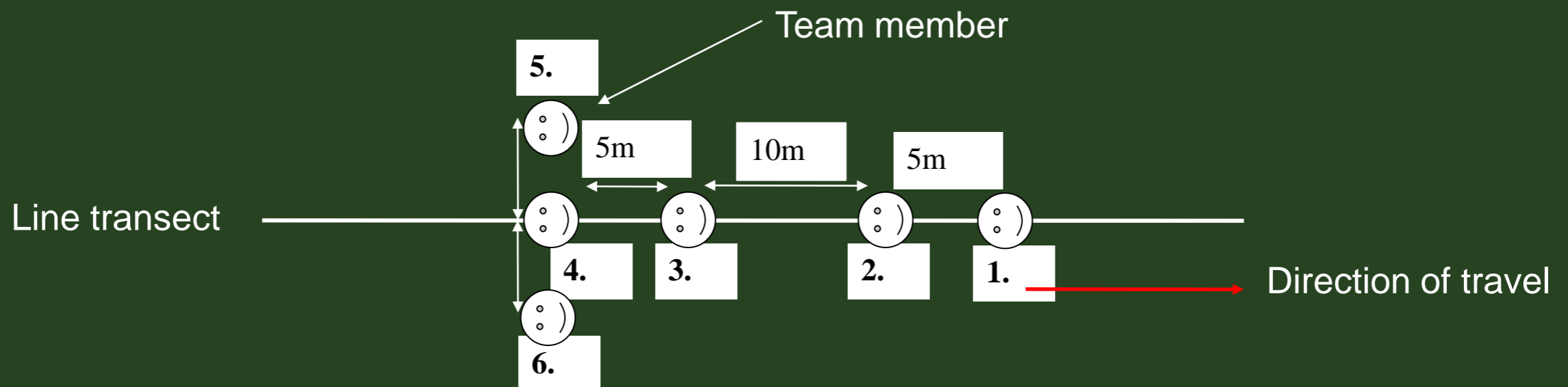
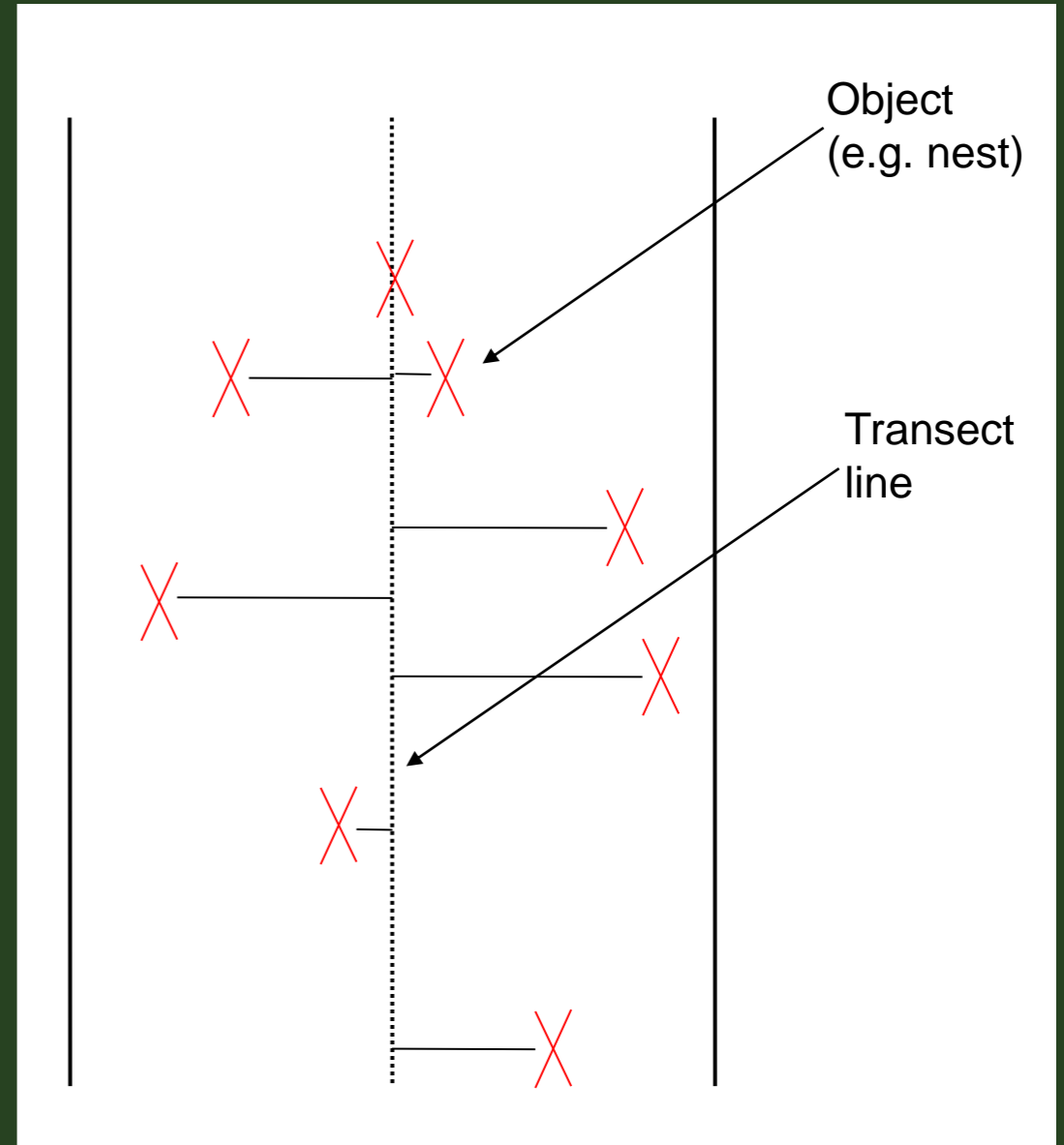


Line transects are representative and, by measuring perpendicular distance to objects (nests and dung), enable us to estimate density



© Antoine Berlemont

Line transects (continued)



Interviews

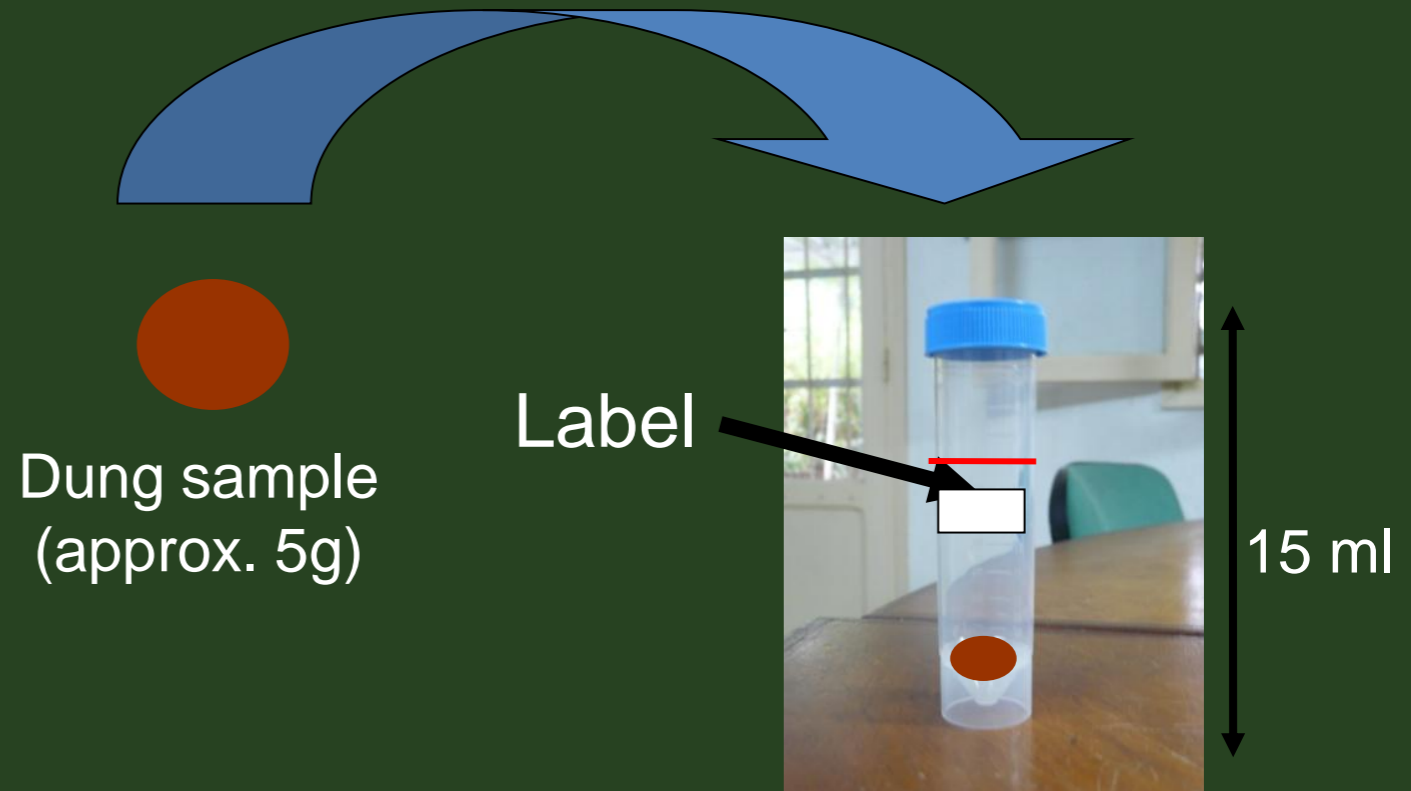
1 interview held at the village closest to each transect, where possible
45 interview questions to determine the presence of threatened primates, specific threats, socioeconomic information, etc.



Samples



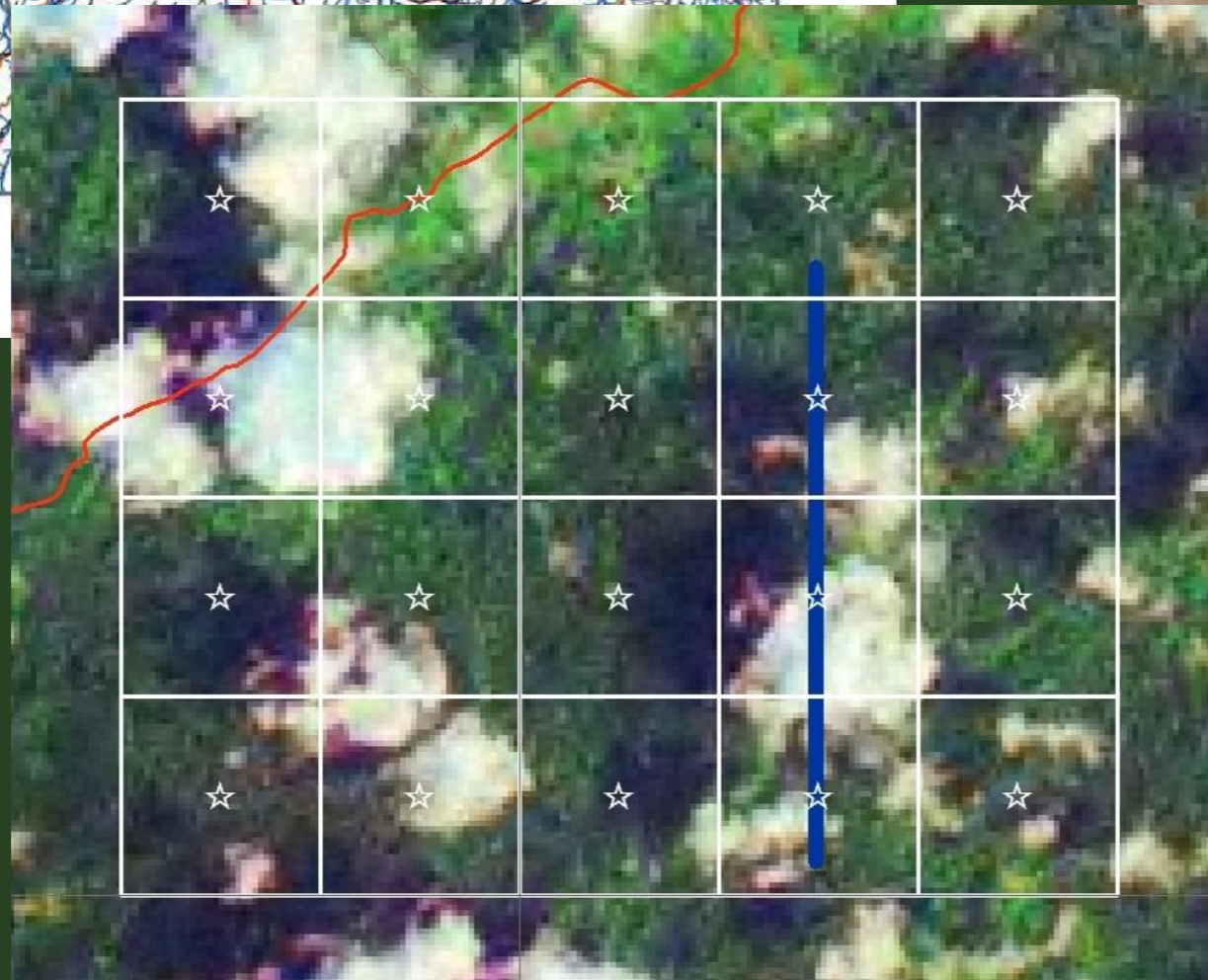
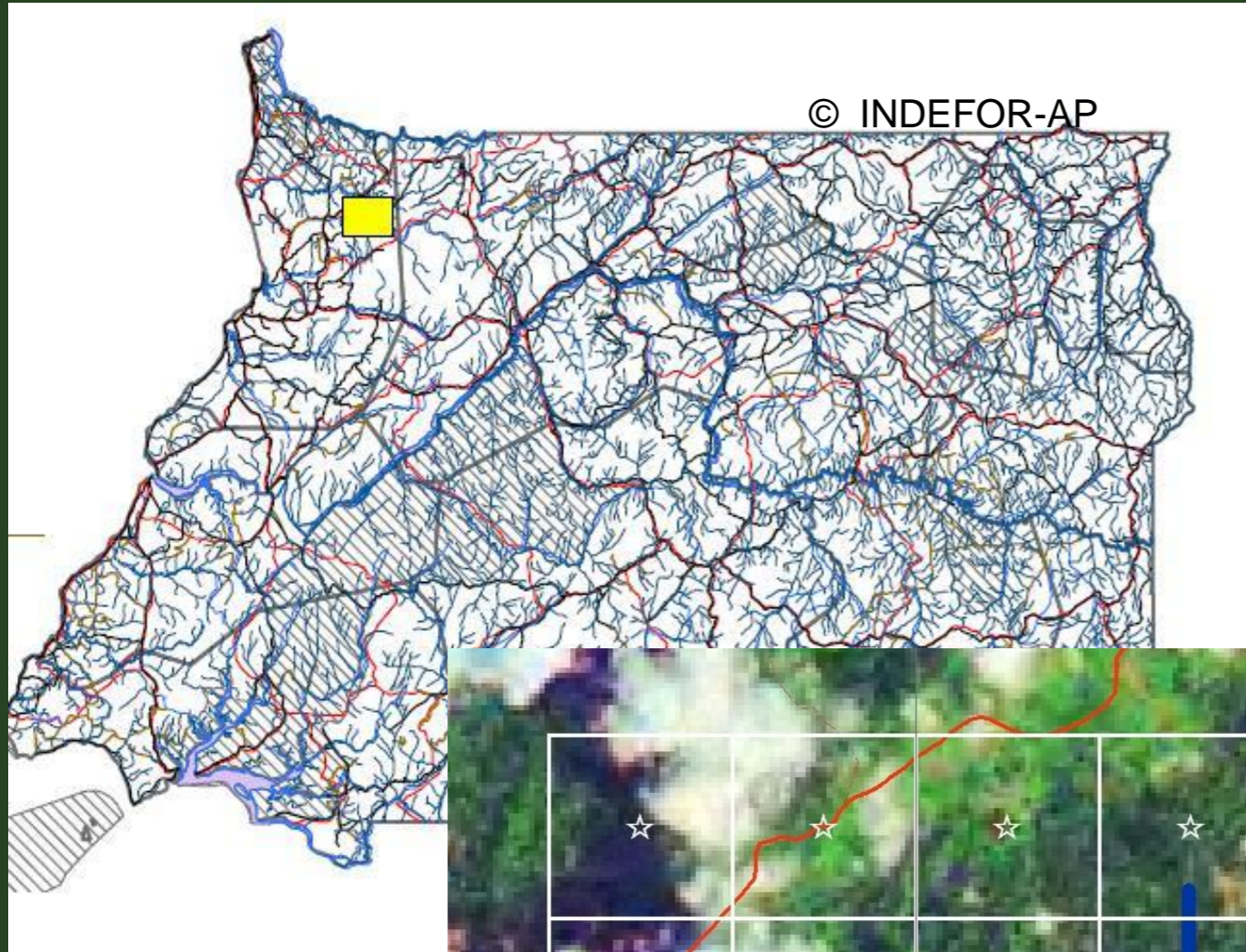
e.g. for pathogenic analysis:



Types of samples collected:

- Genetic: fresh ape dung
- Patogenic: fresh ape dung
- Isotopic: water, soil, plants, bones, empty snail shells, ants, termites, butterfly larvae, feathers, etc.

Camera traps



PRELIMINARY RESULTS



© Heidi Ruffler



© Heidi Ruffler



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Results: Distance covered

Total distance of transects completed:

Team A: 122.099km (43 transects)

Team B: 111.838km (40 transects)



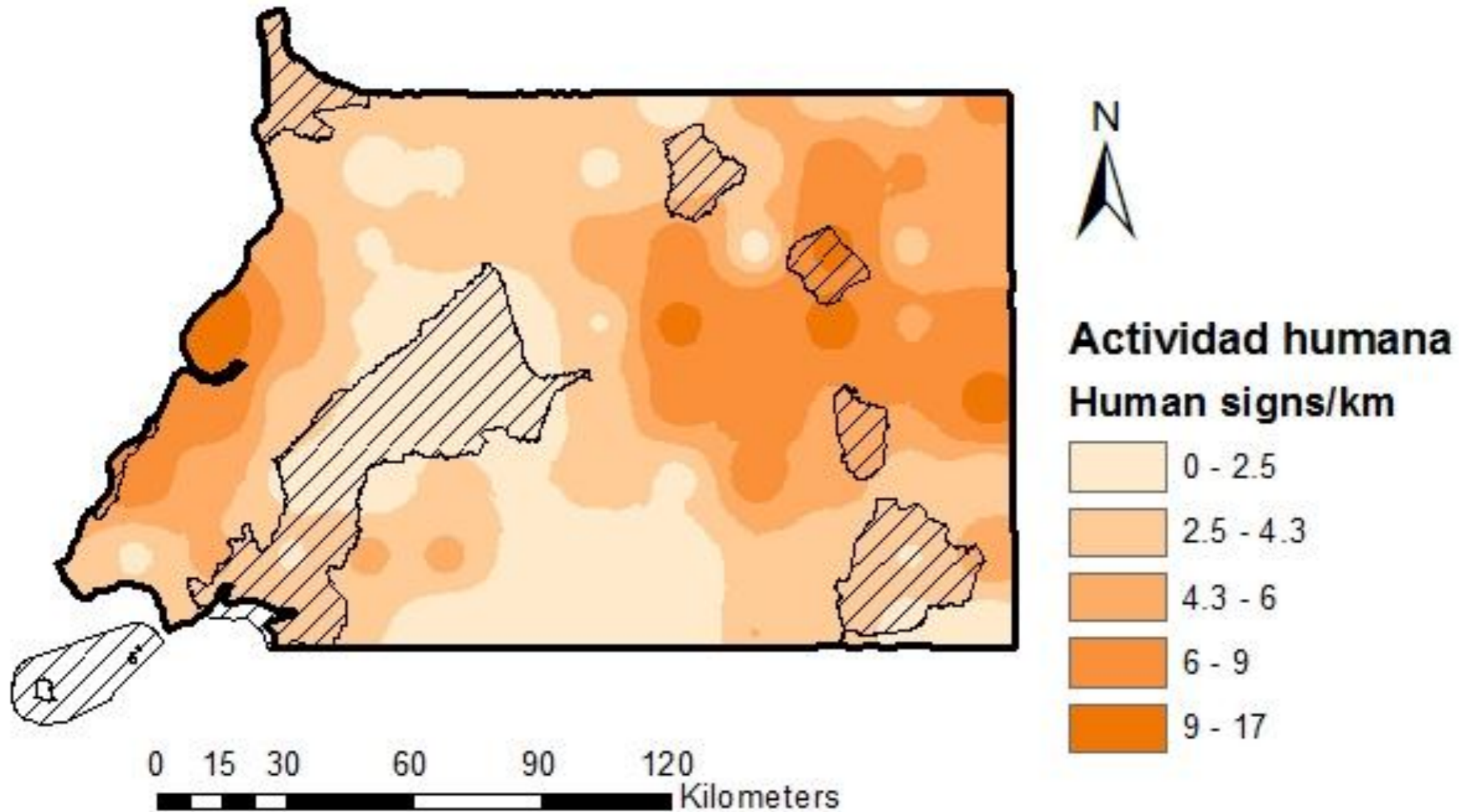
Results: Nest and dung degradation rates

	Degradation rate (in days)	Confidence interval (95%)
Chimpanzees	82.68	69.7 – 104.3
Apes (general)	75.78	60.2 – 96.6
Elephants	80.61	72.8 – 88.9

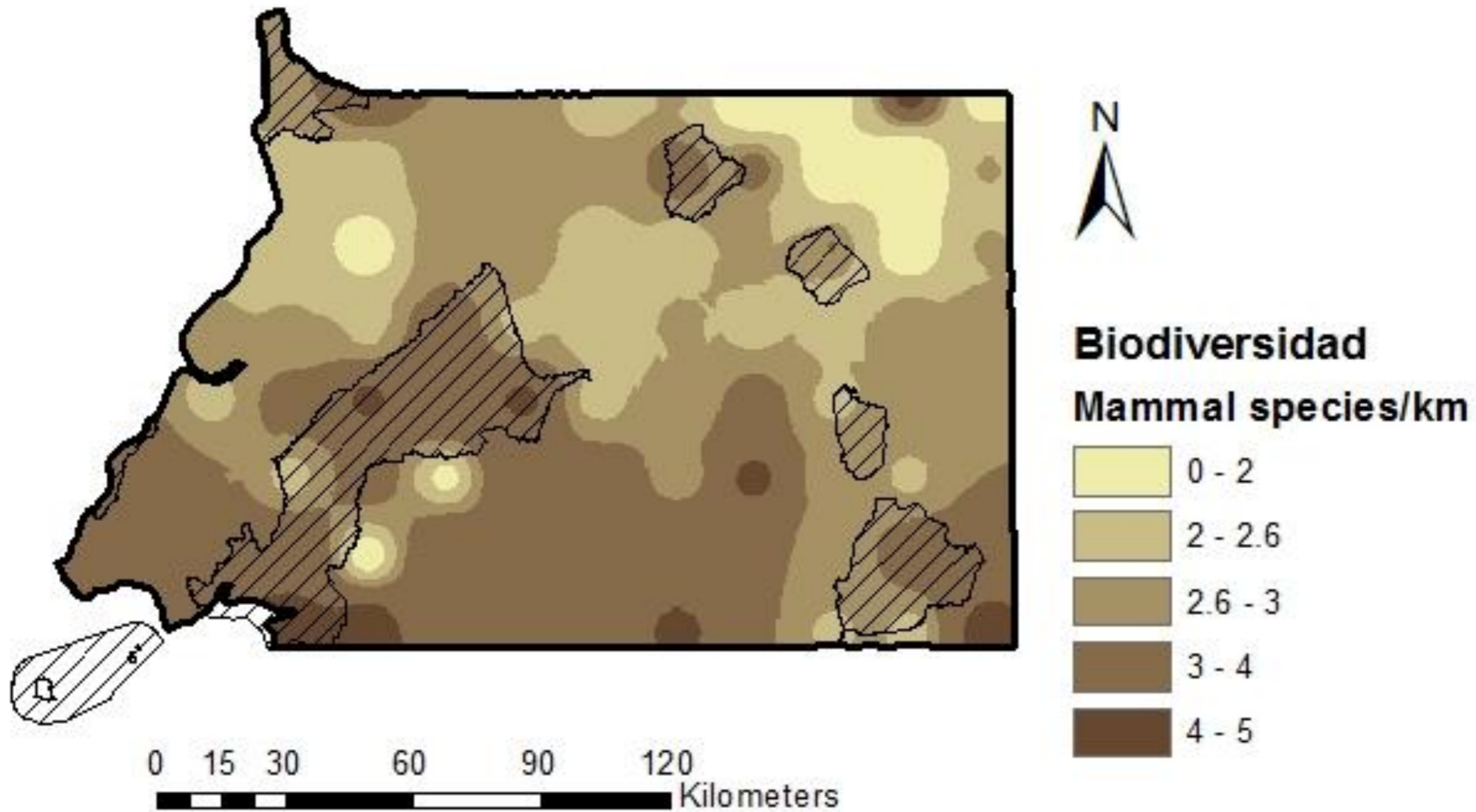


© Mizuki Murai

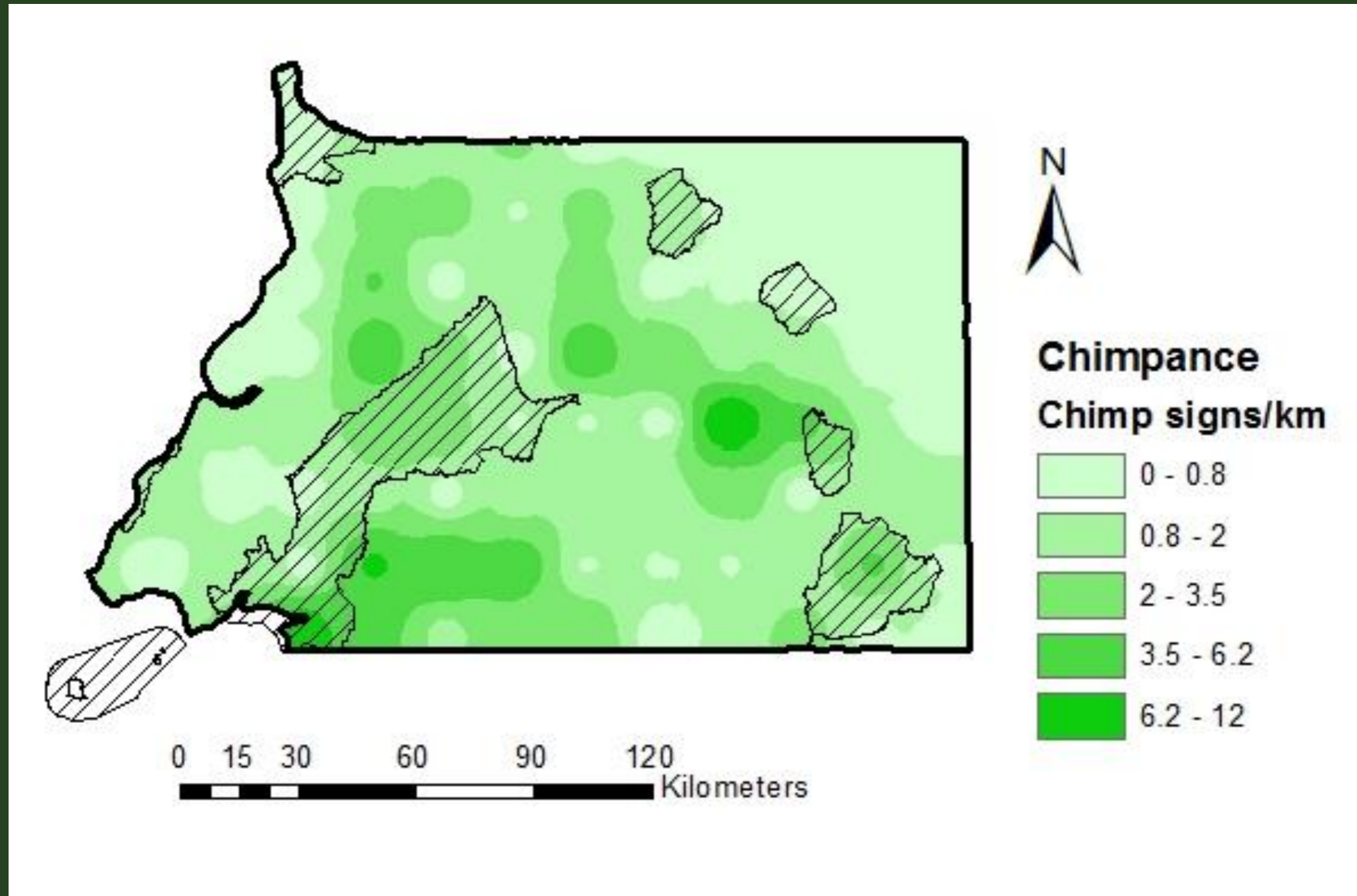
Human Presence



Mammalian Biodiversity

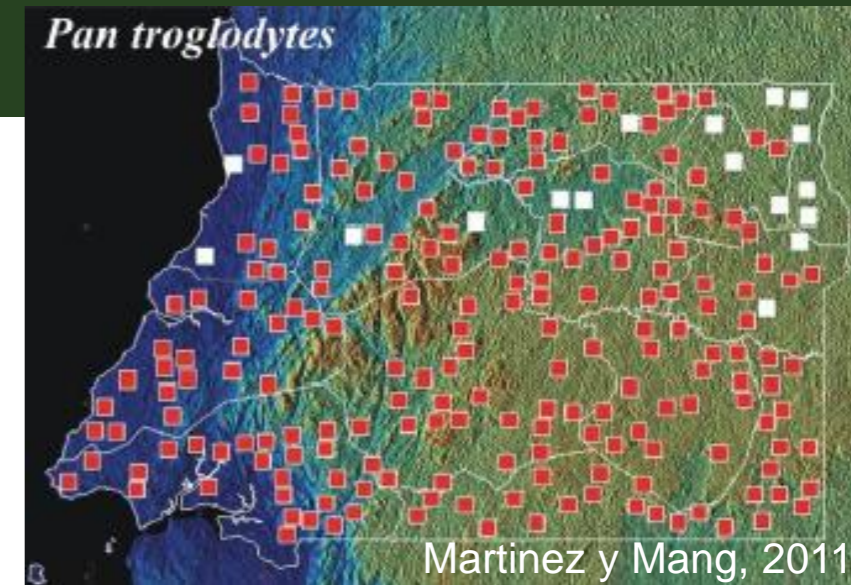
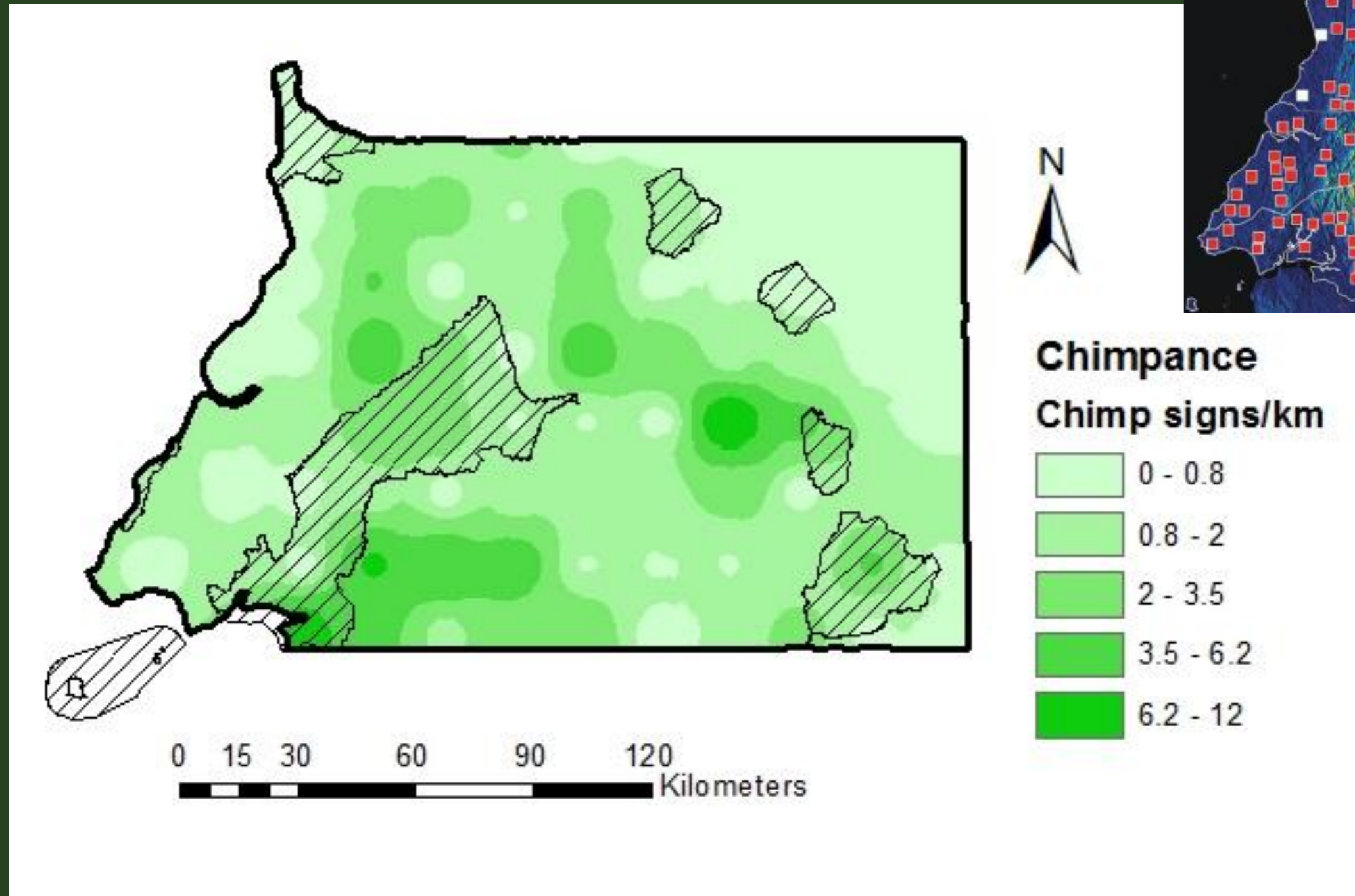


Presence of central chimpanzee (*P. troglodytes troglodytes*)



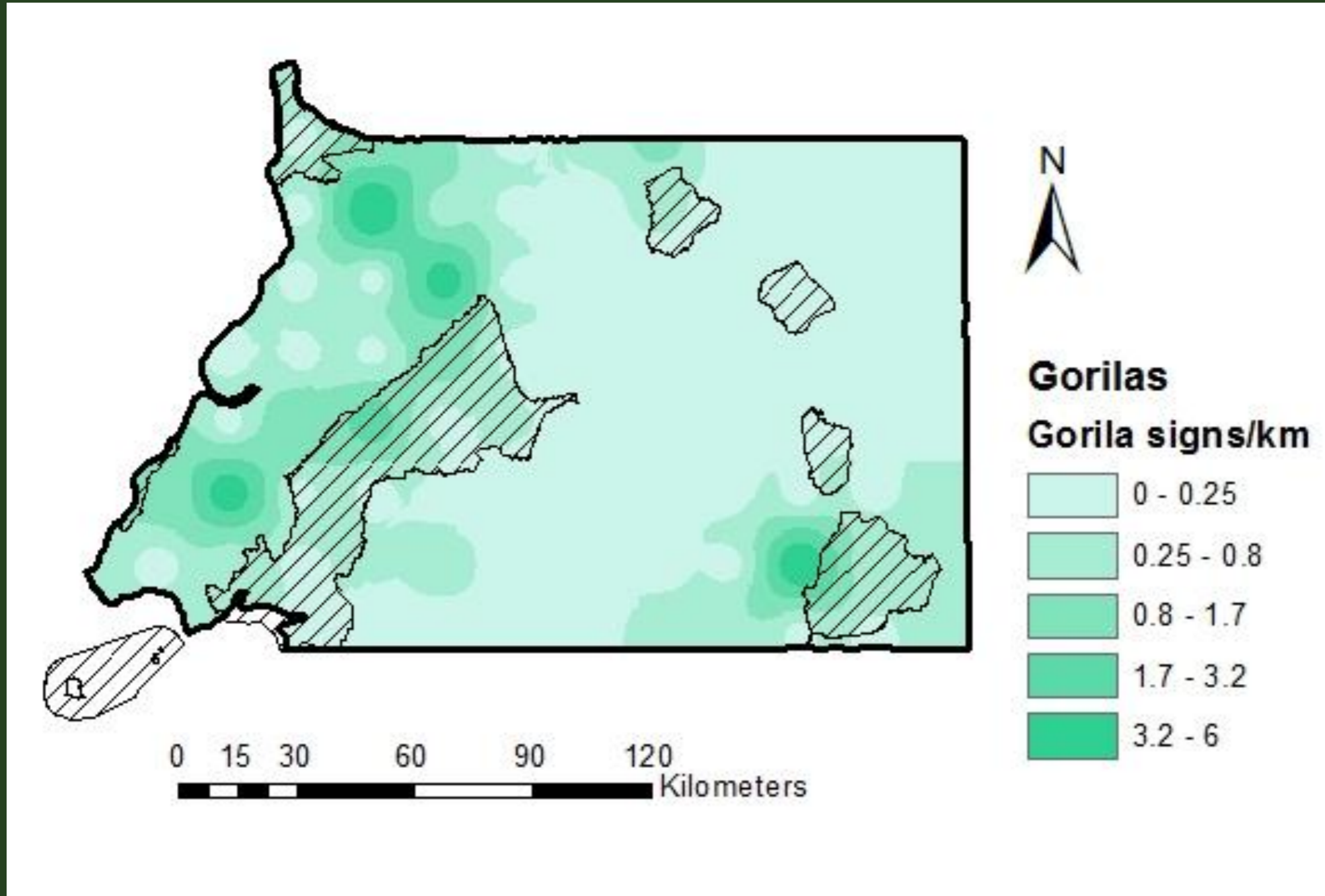
Abundance: **8,049** (5,401 – 11,997); CV = 20%
Effective distance: 18m

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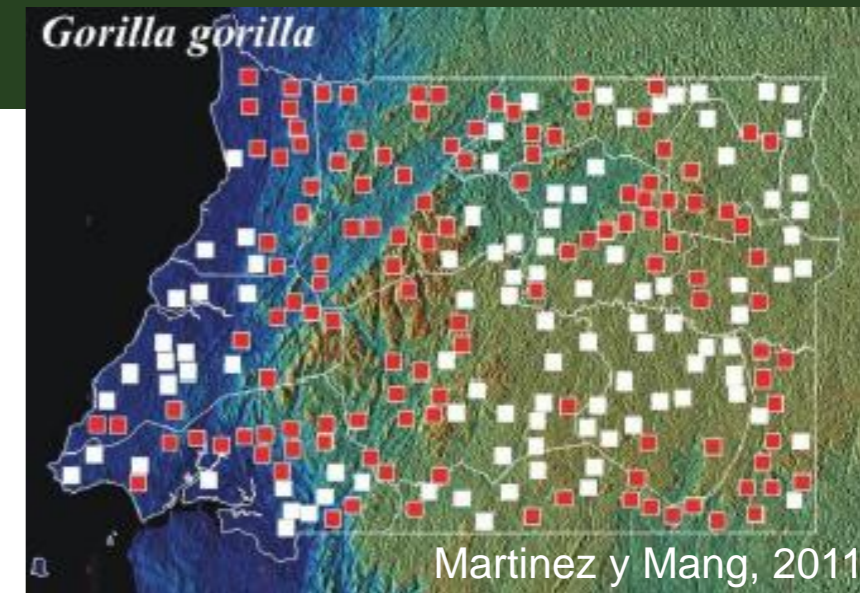
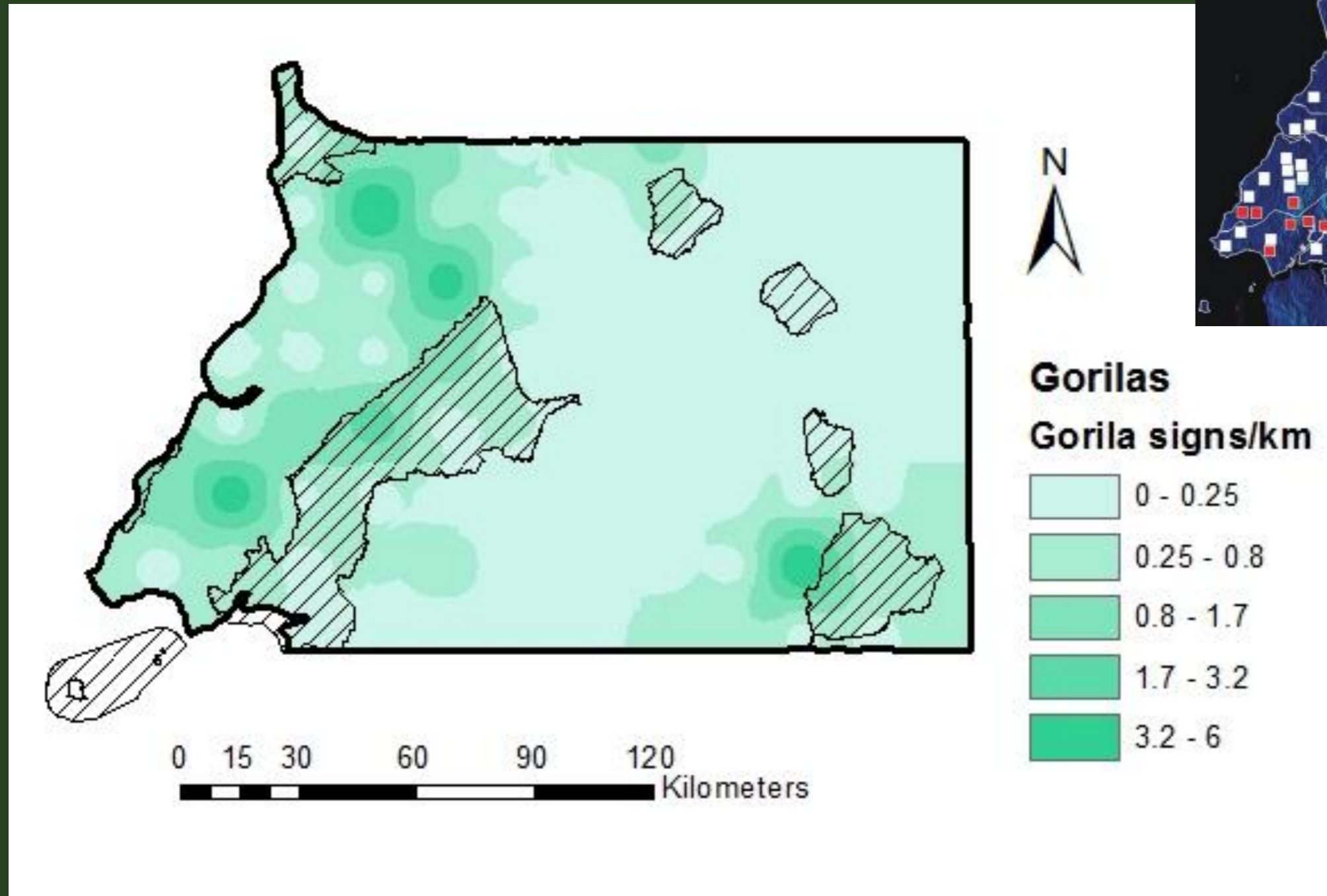
Abundance: 8,049 (5,401 – 11,997); CV = 20%
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Presence of western lowland gorilla (*G. gorilla gorilla*)



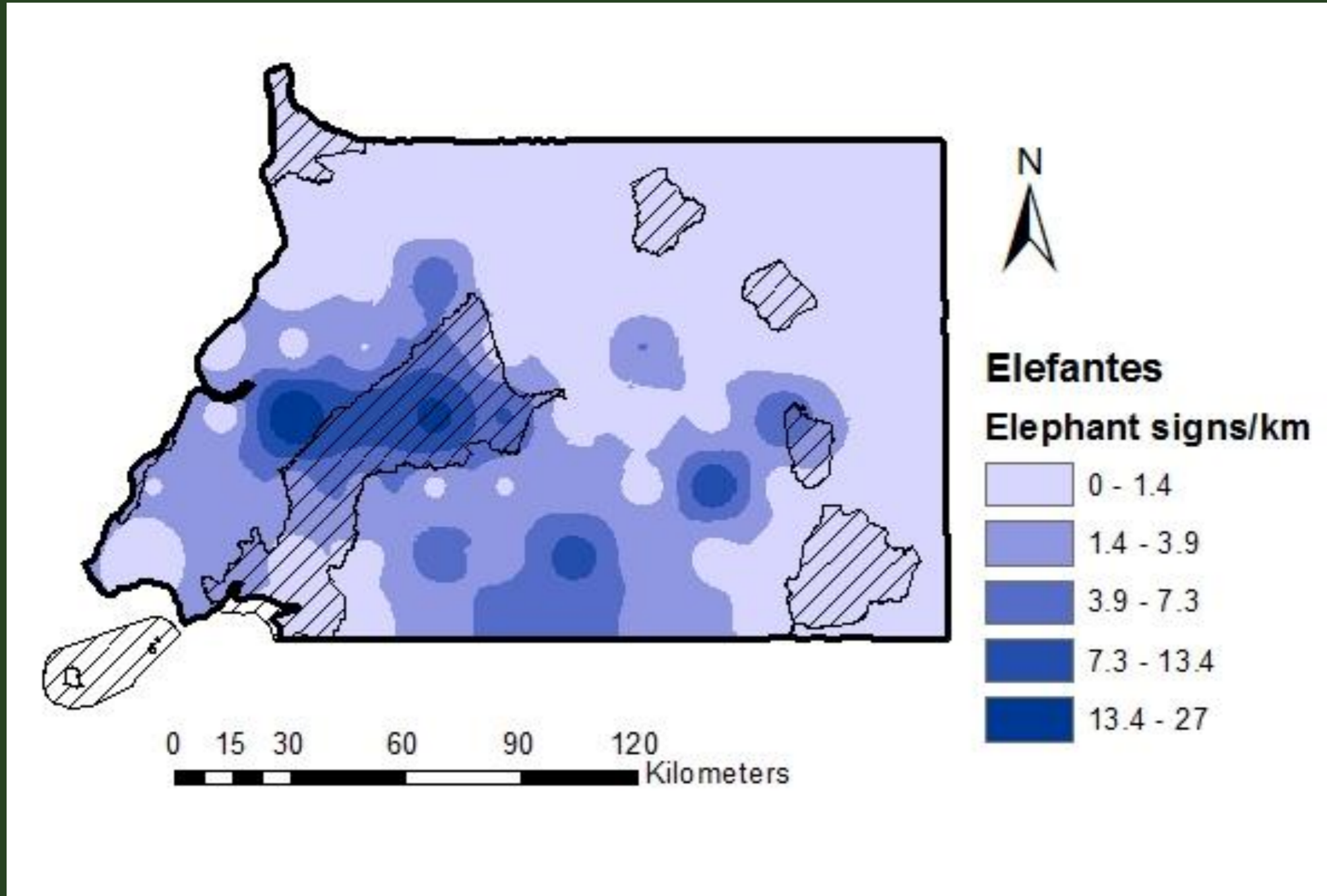
Abundance of all apes: **11,147** (7,615 – 16,317); CV = 19%
Effective distance: 15m

Presence of western lowland gorilla (*G. gorilla gorilla*)



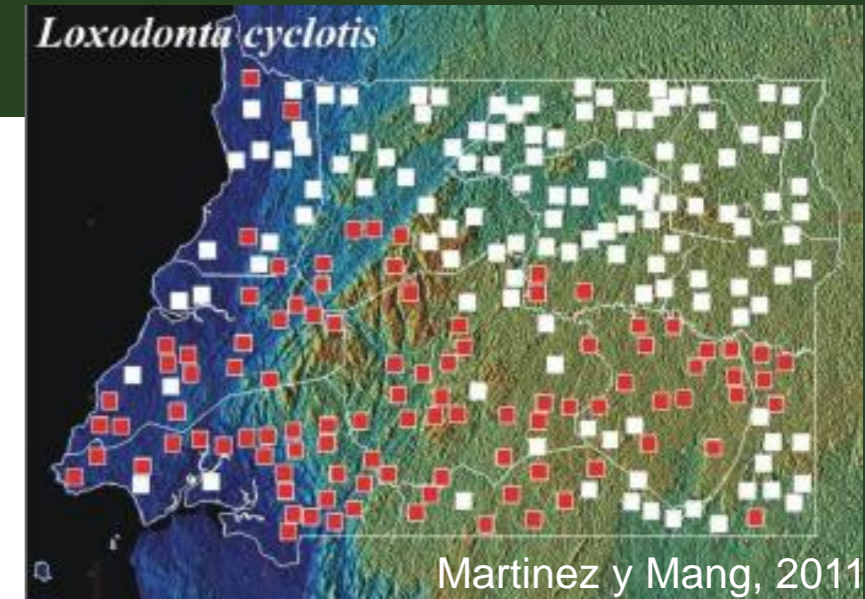
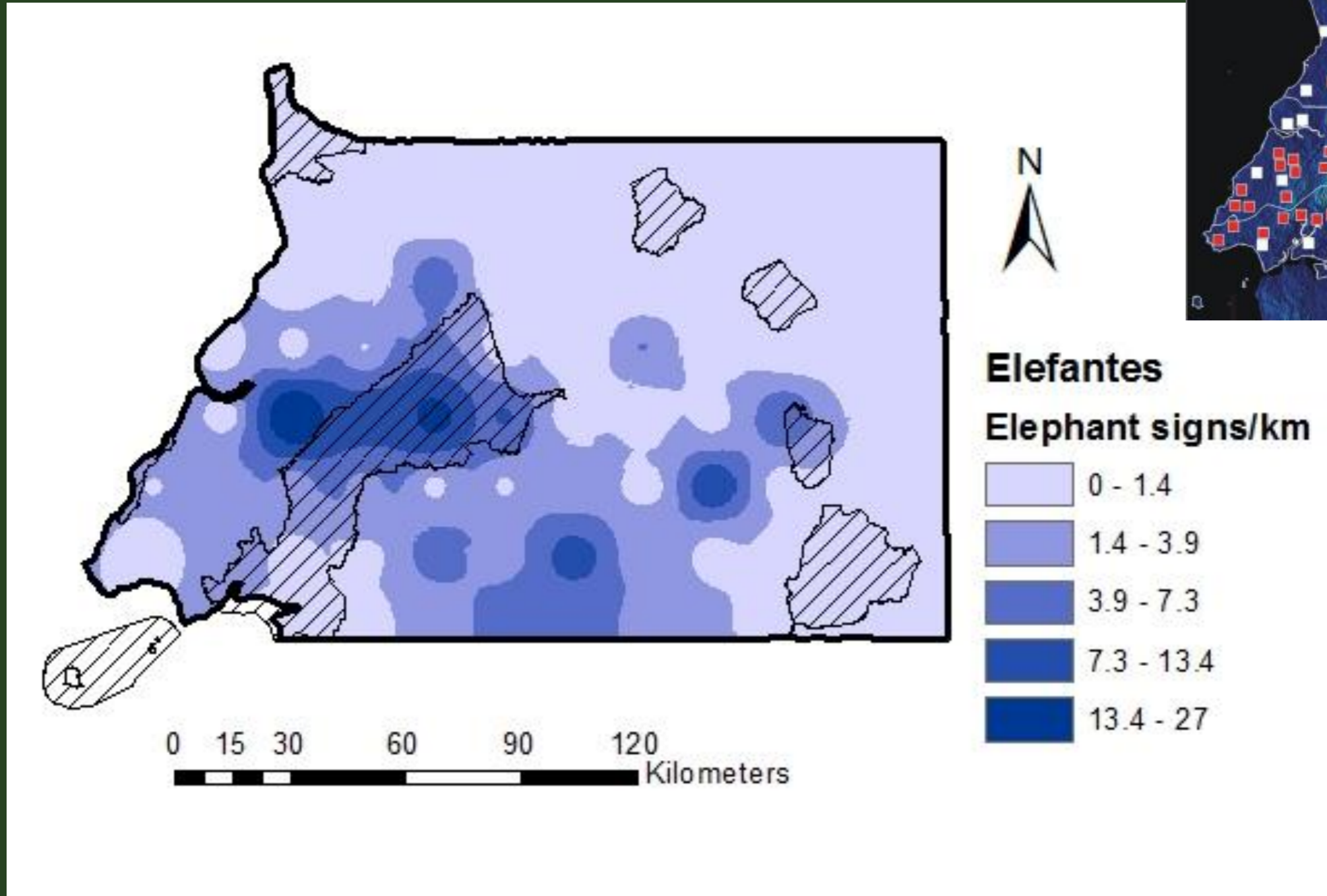
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Presence of forest elephant (*Loxodonta cyclotis*)



Abundance of elephants: **972** (470 – 1.928); CV = 36%
Effective distance: 4m

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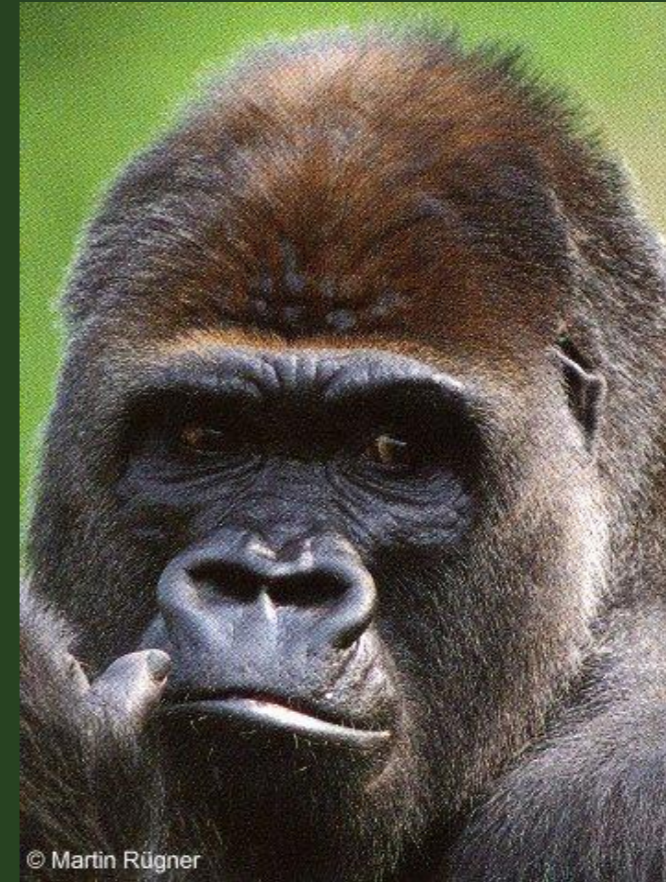




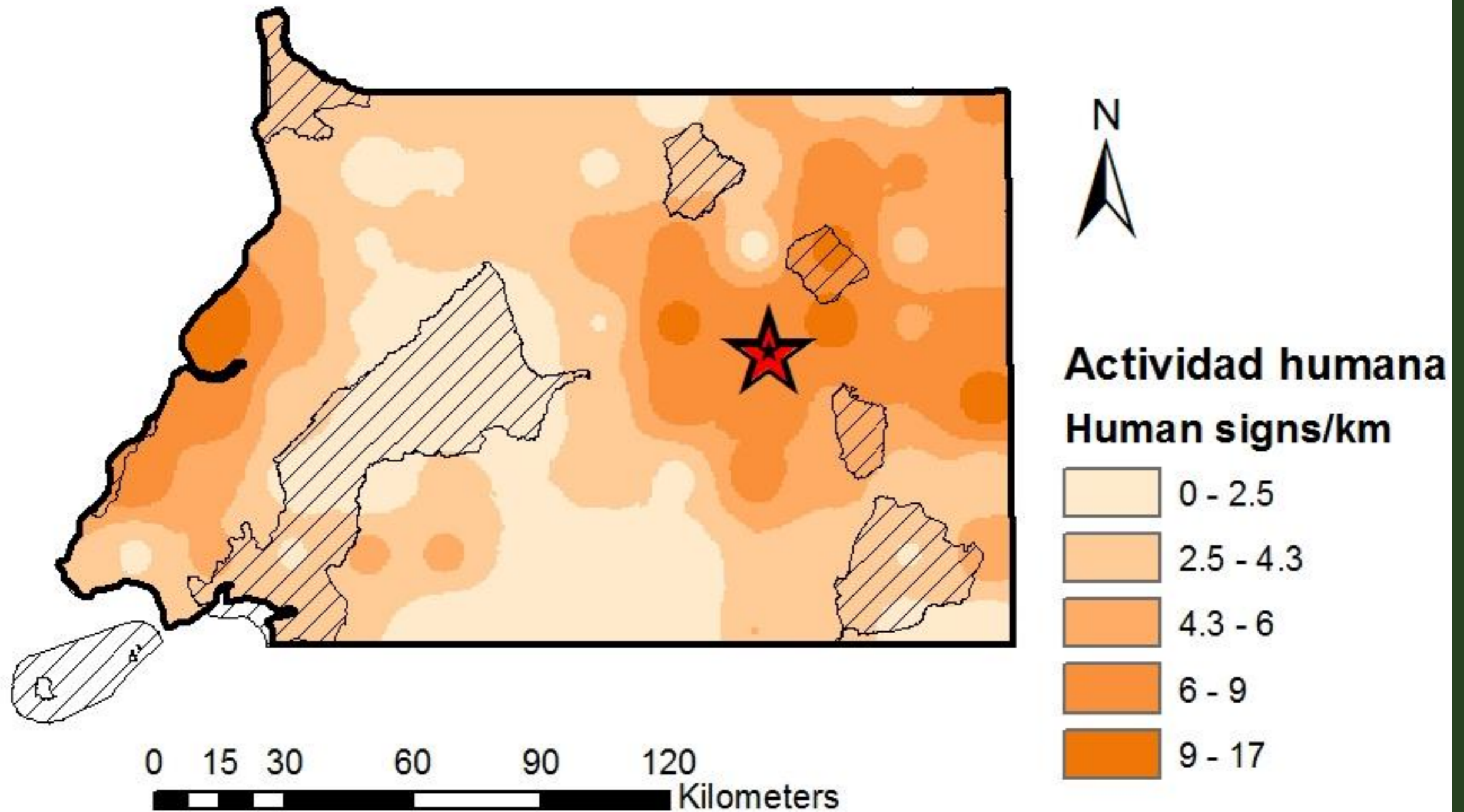




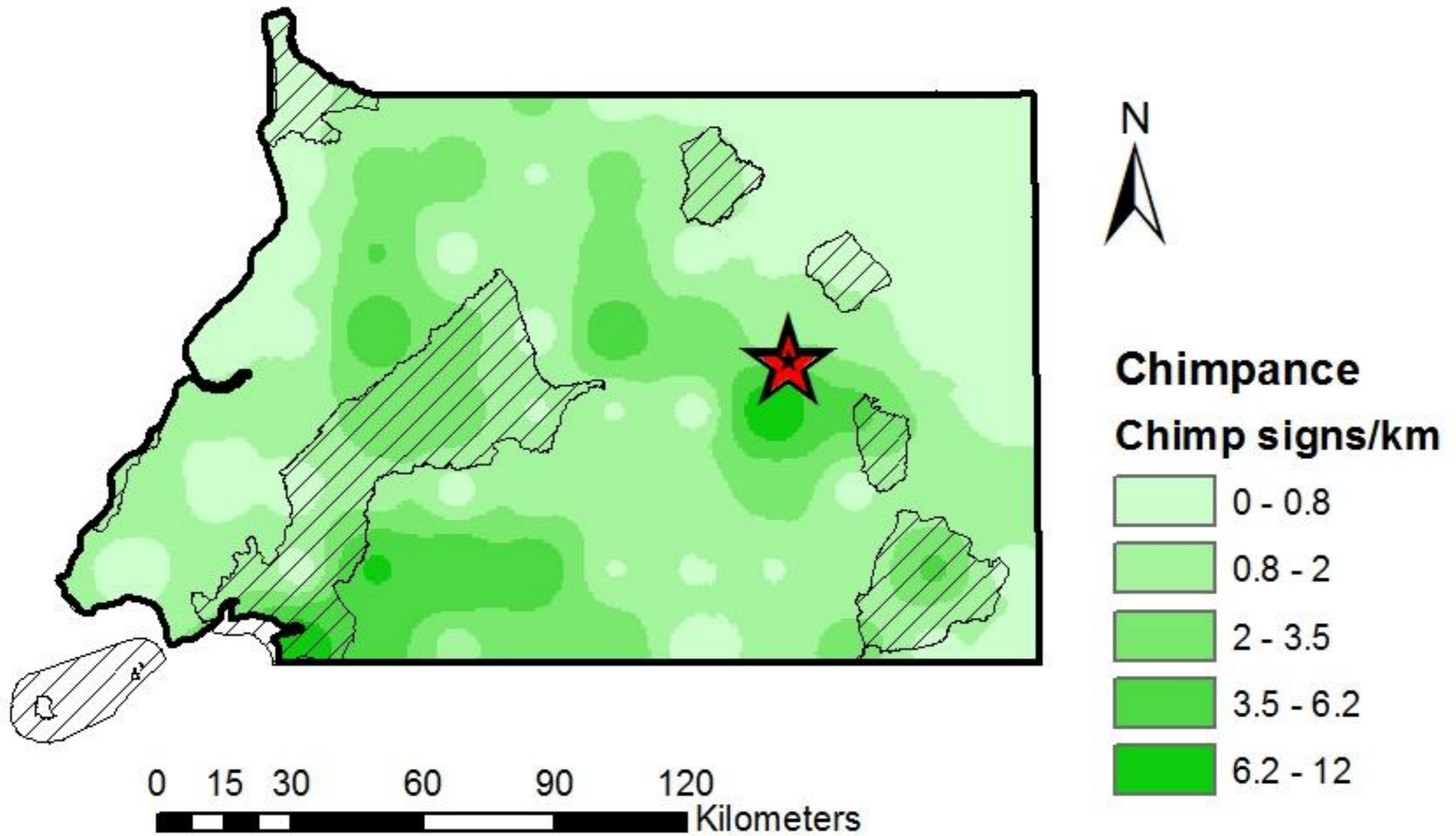
Why do we care?



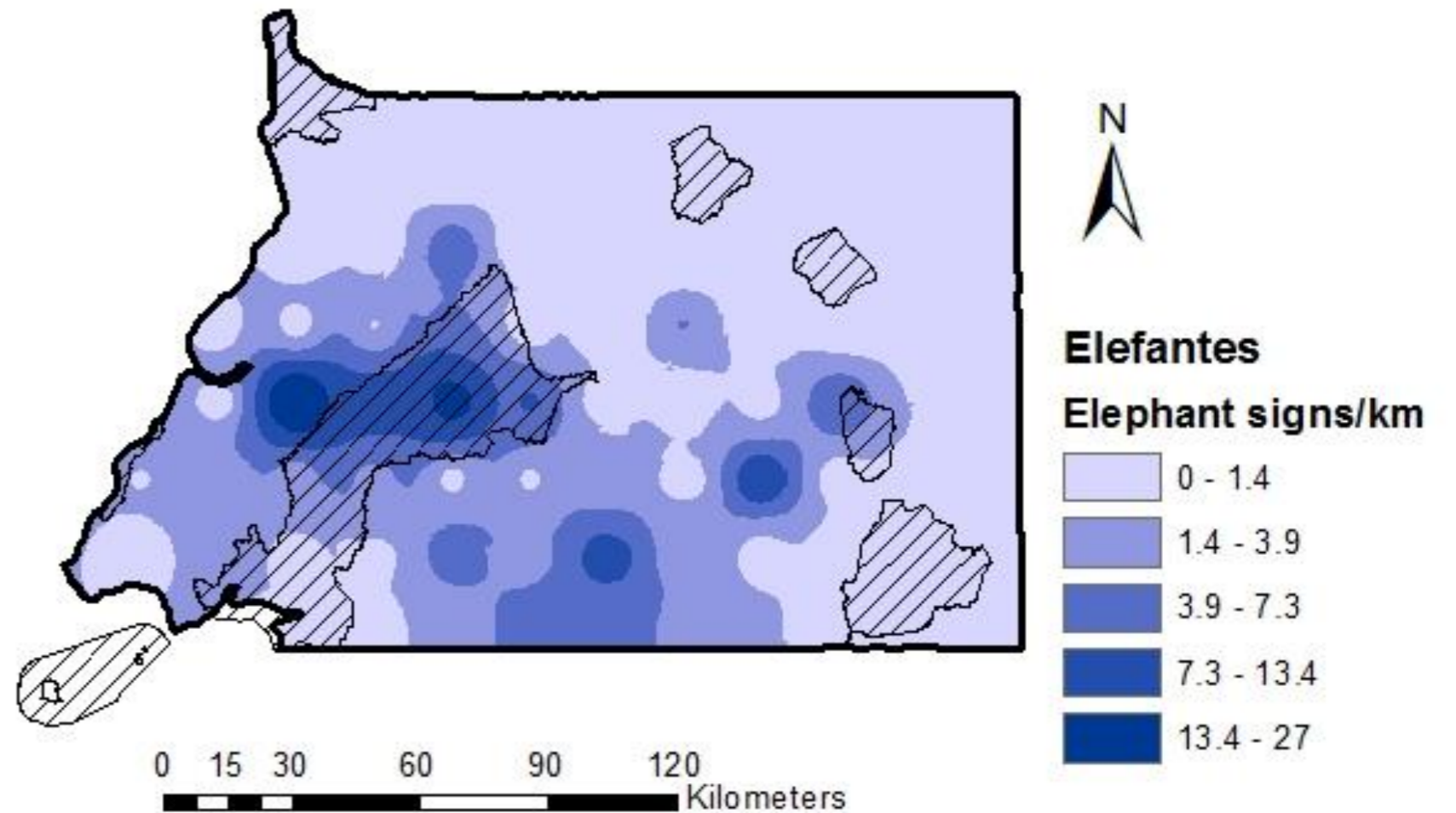
Development: fast-paced towards 2020



Development and chimpanzees



Development and elephants



- Human-elephant conflict of increasing concern to human wellbeing
- Current solution: culling of problem elephants
- Mitigation techniques needed

Where do we go from here?





Economic Systems

- Sustainable Production

Challenge: 2020 Development Plan identifies 4 main pillars for economic diversification:

- energy
- fisheries
- agriculture
- services

Economic Systems

- Sustainable Production

Challenge: 2020 Development Plan identifies 4 main pillars for economic diversification:

- energy
- fisheries
- agriculture
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- logging?



Economic Systems

- Sustainable Production

Challenge: 2020 Development Plan identifies 4 main pillars for economic diversification:

- energy
- fisheries
- agriculture
- services
- logging?

Other key goals include:

“Roads for everyone”

“Water for everyone”

“Electricity for everyone”

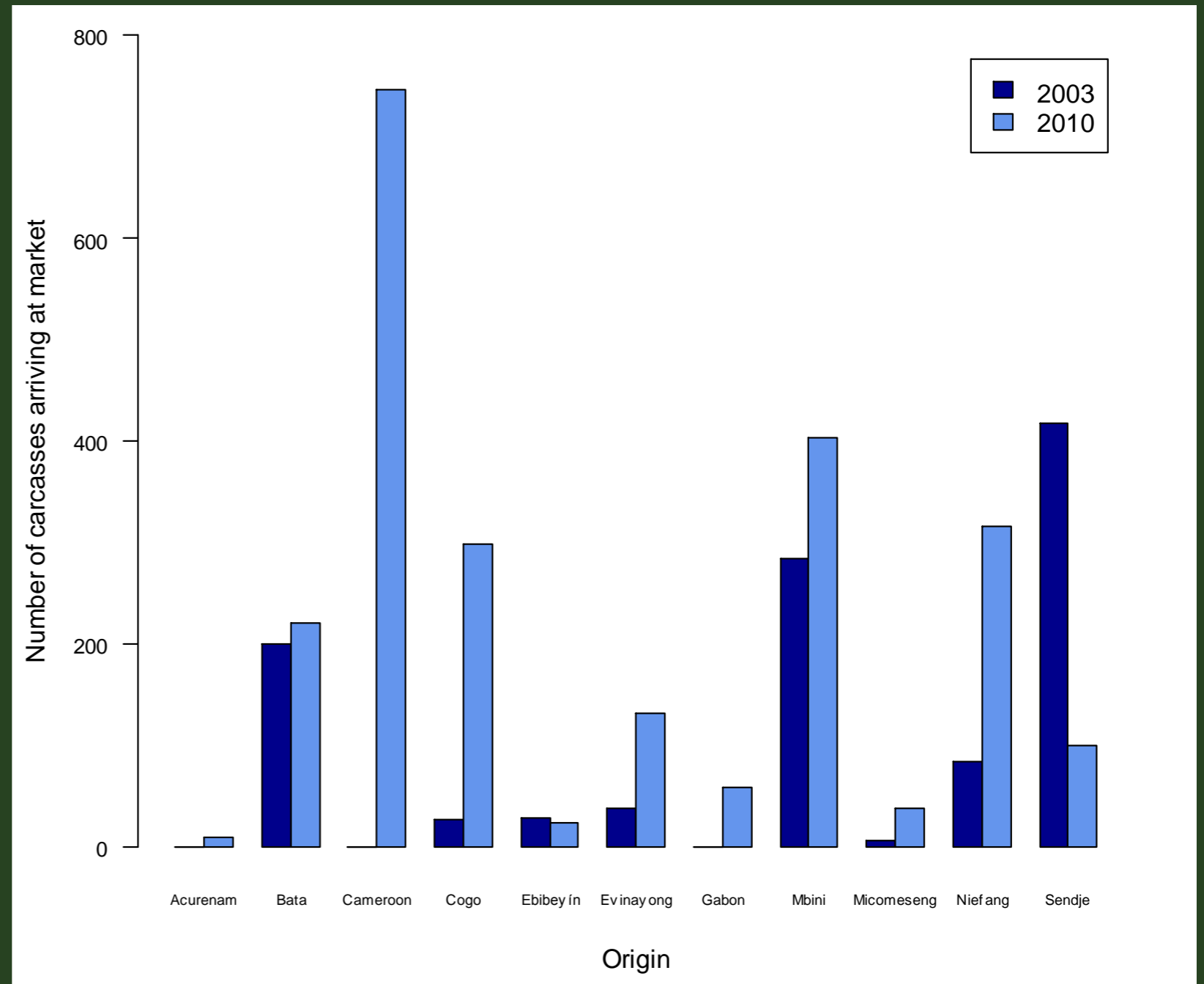
→ Impacts on ecosystem health, ecosystem services and human wellbeing?





Economic Systems

- Sustainable Markets



Supply of bushmeat to a Bata market from eight districts, Gabon, Cameroon and the village of Sendje, between two study periods in 2003 and 2010. Carcass count for each location varied significantly between study periods (Gill 2010)



Economic Systems

- Sustainable Consumption

- Rural communities still depend on bushmeat as source of food and/or income, particularly in lean season (Allebone-Webb 2008)
 - Agriculture increasingly affected by human-elephant conflict in some areas
- Need to continue to work with national and international partners on planning, implementation and monitoring of alternative livelihoods projects



Social Systems

- Sustainable Investments

Opportunity:

Add value to EG's 2020 Development Plan by:

- Incorporating “green economy” planning
- Engaging in legal reform and implementation

1. Energy

- Incorporate EIAs for EG's infrastructure development and energy sector;
- Sustainable energy sources, with particular focus on solar energy;

2. Fisheries

- Engage in fisheries management, including resource monitoring;

Social Systems

- Sustainable Investments

3. Agriculture

→ Promote sustainable agriculture development, with focus on reducing human-wildlife-conflict;

4. Services

→ Tourism services, with particular focus on development of nature-based tourism;

5. Logging:

→ Forestry management, with focus on carbon stock measuring and REDD pilot projects;
→ Protected area management, including sustainable management of EG's coastlines;



Social Systems

- Sustainable Investments

3. Agriculture

→ Promote sustainable agriculture development, with focus on reducing human-wildlife-conflict;

4. Services

→ Tourism services, with particular focus on development of nature-based tourism;

5. Logging:

→ Forestry management, with focus on carbon stock measuring and REDD pilot projects;
→ Protected area management, including sustainable management of EG's coastlines;

Introduction and management of financial mechanisms to ensure sustainable conservation of EG's resources and increased human wellbeing.



Next Steps

Communication: documentary, outreach, high-level meetings

Development of 5-year plan

Closer working relationship with private sector, civil society and government officials, including Ministry of Infrastructure, etc., as well as with other international NGOs (health, etc.)

Support of additional NGOs and civil society groups in EG, in particular those focused on women





Special Thanks To:

US Fish and Wildlife Service (USFWS)
Margot Marsh Biodiversity Foundation
Private donor
USAID/CARPE
US Embassy in Equatorial Guinea

Hjalmar Kühl and Geneviève Campbell of the Max-Planck Institute for Evolutionary Anthropology (MPI)

Instituto Nacional de Desarrollo Forestal y Gestión del Sistema Nacional de Áreas Protegidas (INDEFOR-AP)

Amigos de la Naturaleza y del Desarrollo de Guinea Ecuatorial (ANDEGE)

Universidad Nacional de Guinea Ecuatorial (UNGE)

Chele Martinez Marti and Angeles Mang

CI staff who supported us from afar



Special Thanks To:

The international stars who made it possible: Antoine Berlemont , Mizuki Murai and Anthony Agbor

The field team members and camera crew: Agustin Ebana, Cayetano Ebana, Juan Antonio Edjang, Diosdado Esono, Gloyer Matala, Santiago Mba, Domingo Mbomio, Leoncio Nguema, Jose Nsue, Benjamin Nvele, Antonio Nze, Mariano Obama, Bonifacio Owono, Fernando Owono and Antonio Rius

And the people of Equatorial Guinea who welcomed us into their villages and forests



Thank you!
Questions?

h.ruffler@conservation.org