

Interactions between forest elephants (*Loxodonta cyclotis*) and selective logging in central Africa

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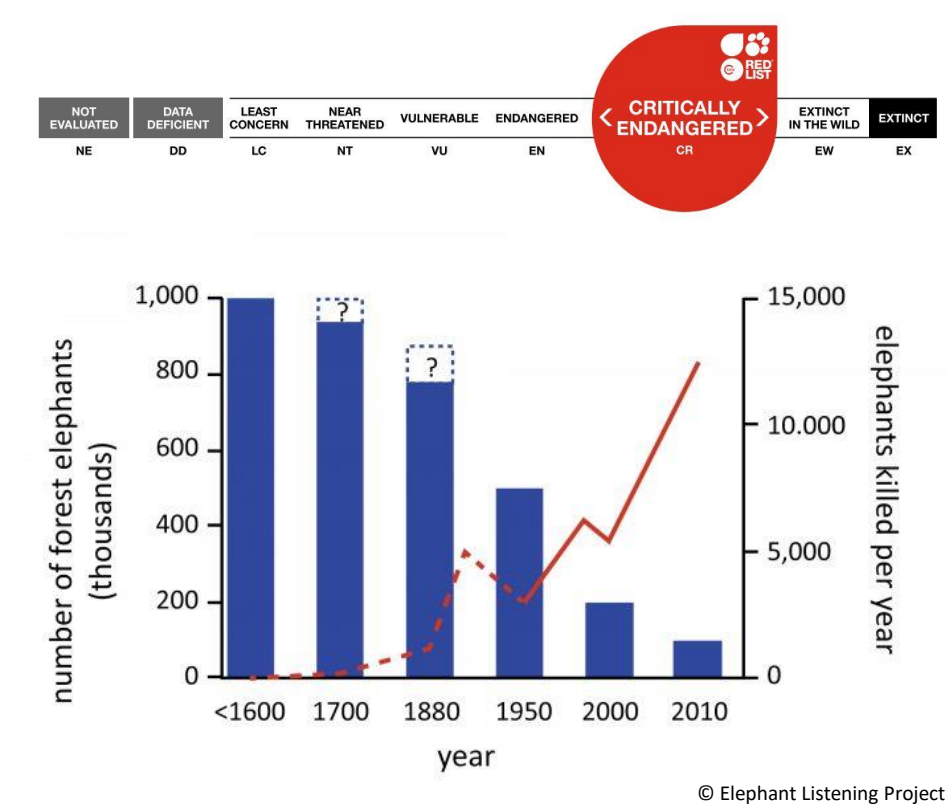


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FRANCE
7- 9 June 2022





Fragmentation







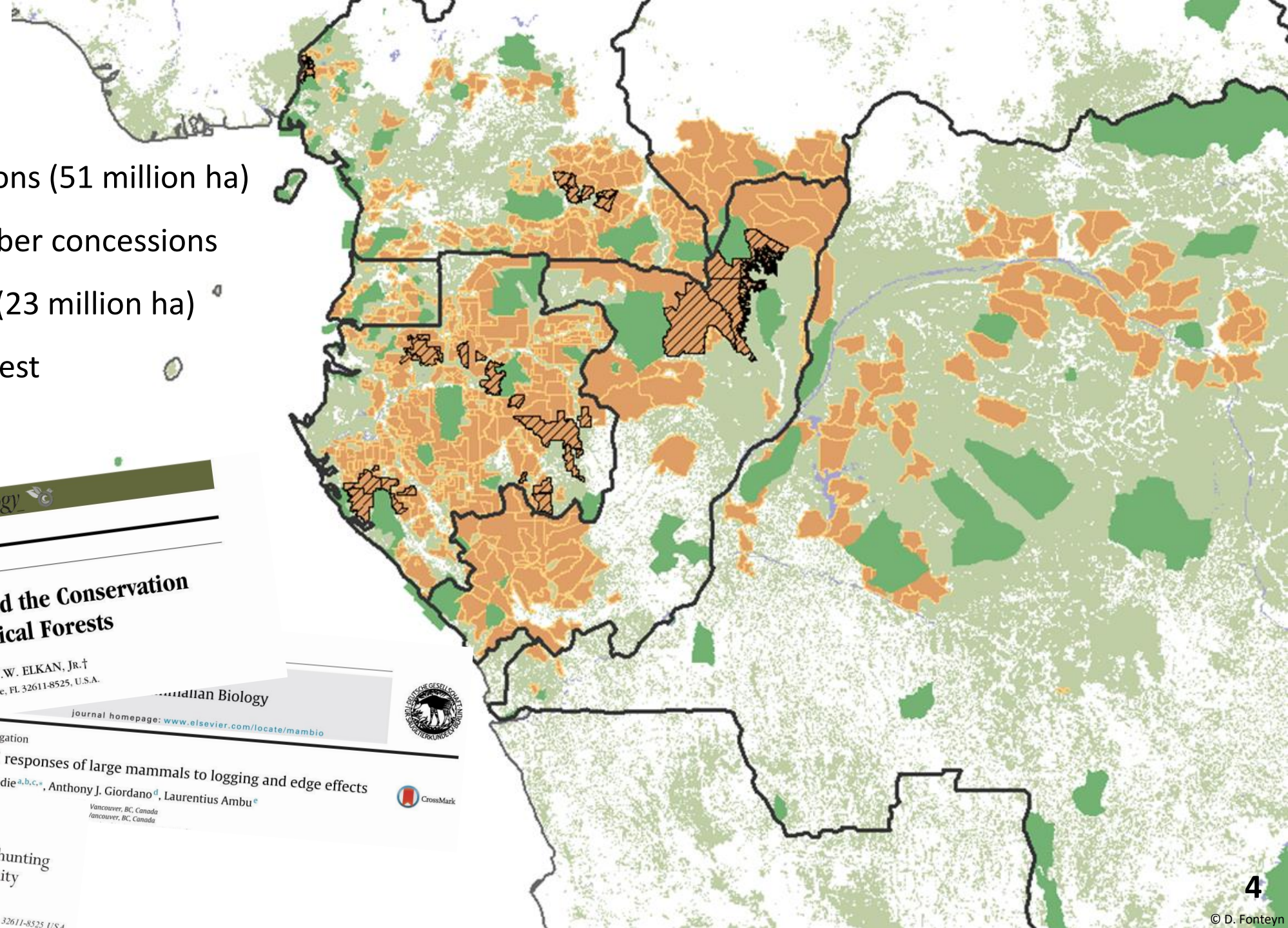
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Forest elephants shape landscapes



-  Timber concessions (51 million ha)
-  FSC certified timber concessions
-  Protected areas (23 million ha)
-  Dense humid forest



Conservation Biology

Contributed Paper

Logging Concessions Can Extend the Conservation Estate for Central African Tropical Forests

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Journal homepage: www.elsevier.com/locate/mambio



Original Investigation
 Differential responses of large mammals to logging and edge effects
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Decoupling the effects of logging and hunting on an Afrotropical animal community

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1. Logging impact

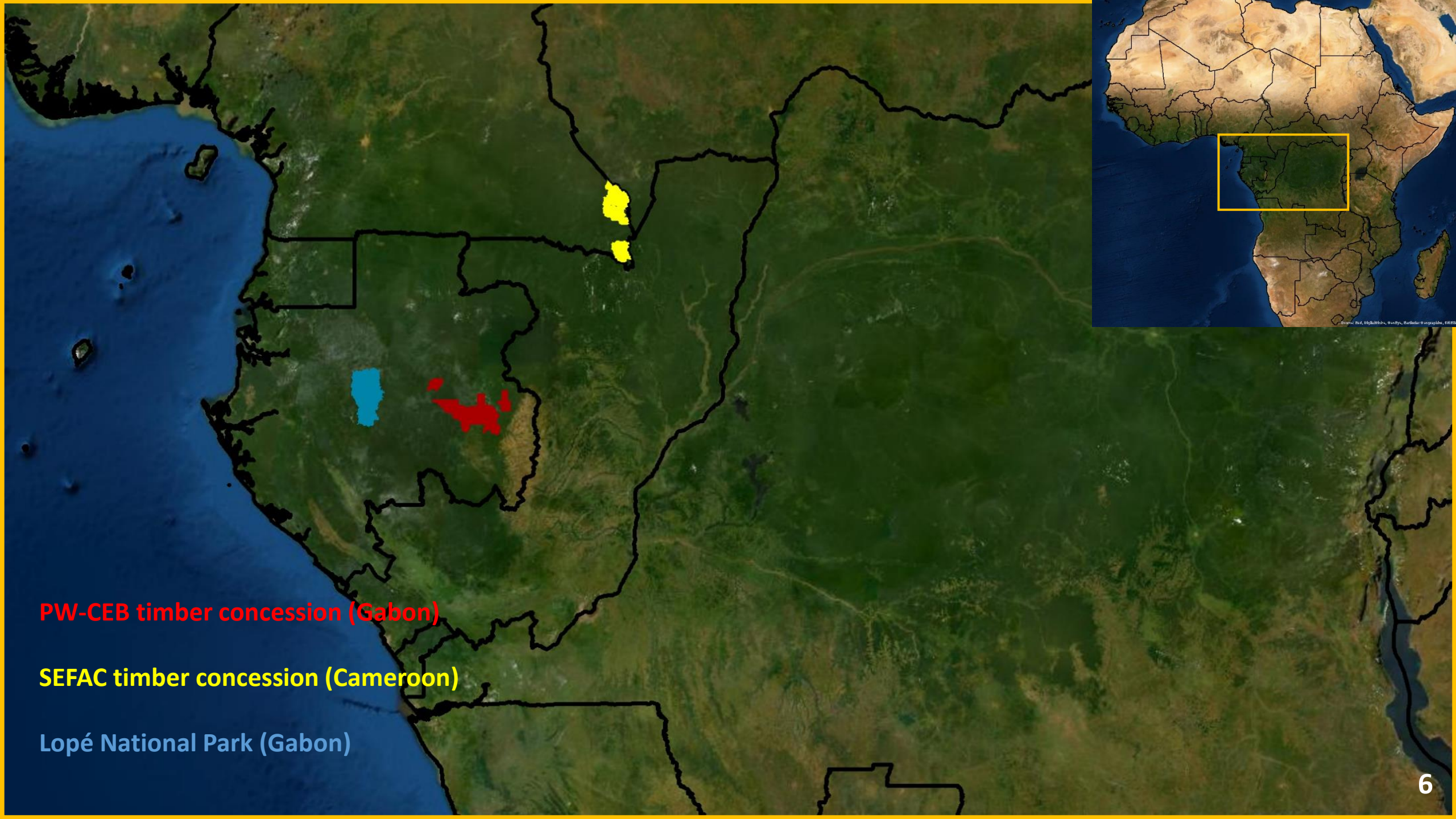


2. Seed dispersal



3. Elephant damage





PW-CEB timber concession (Gabon)

SEFAC timber concession (Cameroon)

Lopé National Park (Gabon)

1. Logging impact

SEFAC (Cameroon)

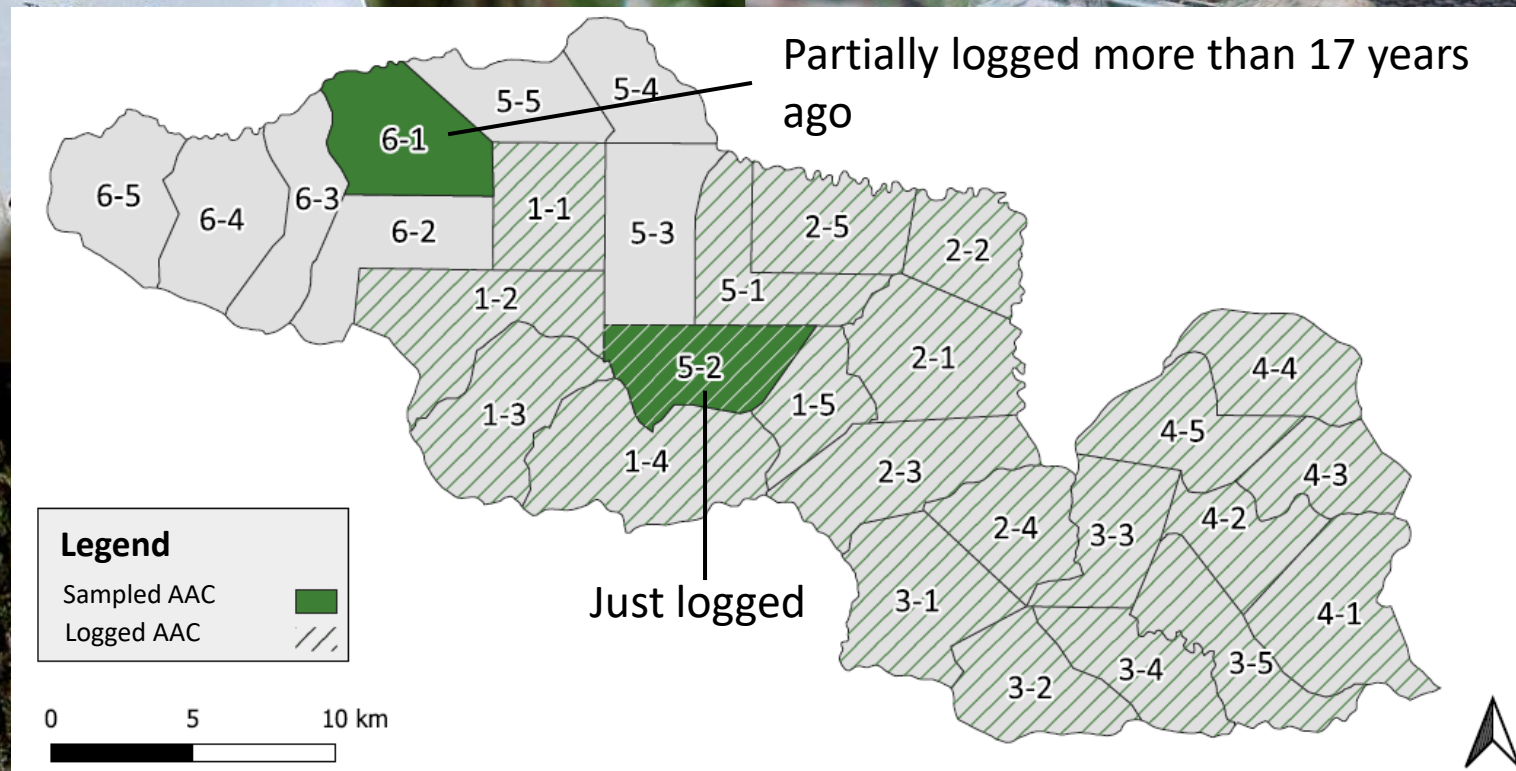


1. Logging impact

SEFAC (Cameroon)

Method: 24 camera traps and 12 acoustic sensors equally distributed in 2 annual allowable cut (AAC)

Tossens, 2021

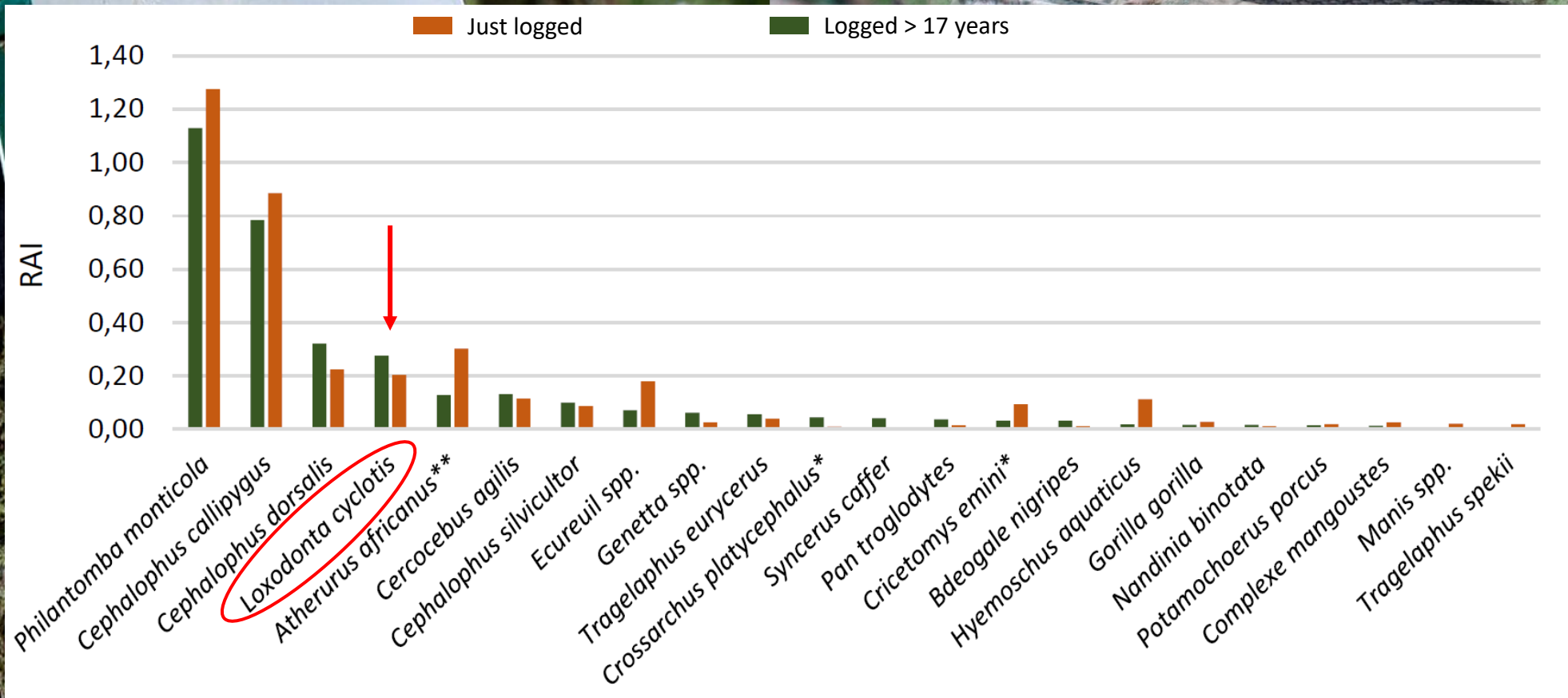


1. Logging impact

SEFAC (Cameroon)

Results: No significant differences between formerly and recently logged areas

Tossens, 2021



2. Seed dispersal

CEB-PW (Gabon) + Lopé National Park (Gabon)

Method: camera trap at the base of trees with fruits

- 4 *Detarium macrocarpum* (mambodé)
- 7 *Bobgunnia fistuloides* (pao rosa)
- 7 *Tieghemella africana* (douka)
- 9 *Baillonella toxisperma* (moabi)



2. Seed dispersal

CEB-PW (Gabon) + **Lopé National Park (Gabon)**

Preliminary results: Forest elephants are the main seed dispersers of pao rosa and mambodé

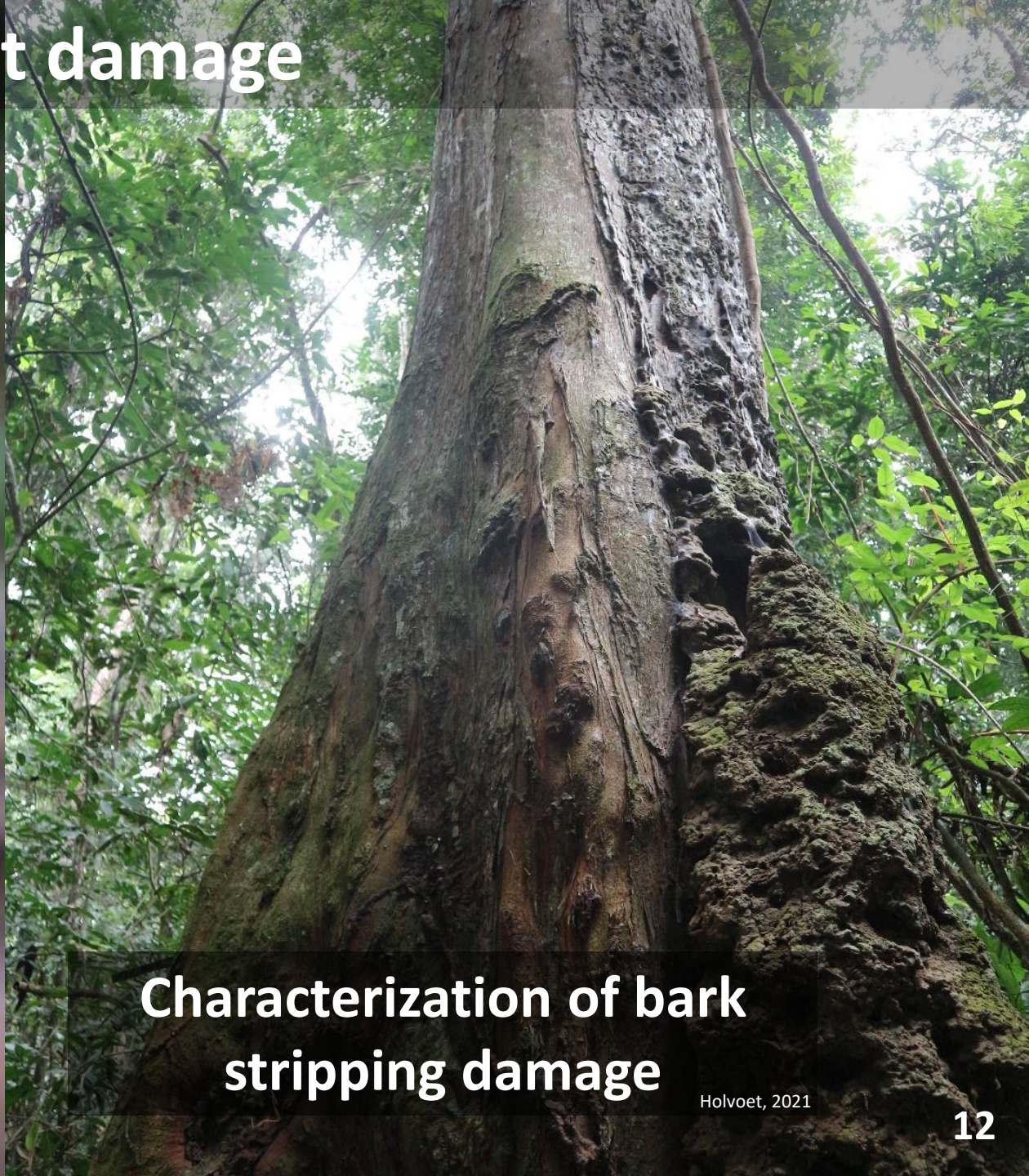
d'Aspremont Lynden, 2020



3. Elephant damage



**Characterization of damage
in reforested logging gaps**



**Characterization of bark
stripping damage**

3. Elephant damage

CEB-PW (Gabon)

Method: 91 logging gaps reforested with 819 seedlings
60 camera traps
Observation of damage after 3 months



3. Elephant damage

CEB-PW (Gabon)

Preliminary results:

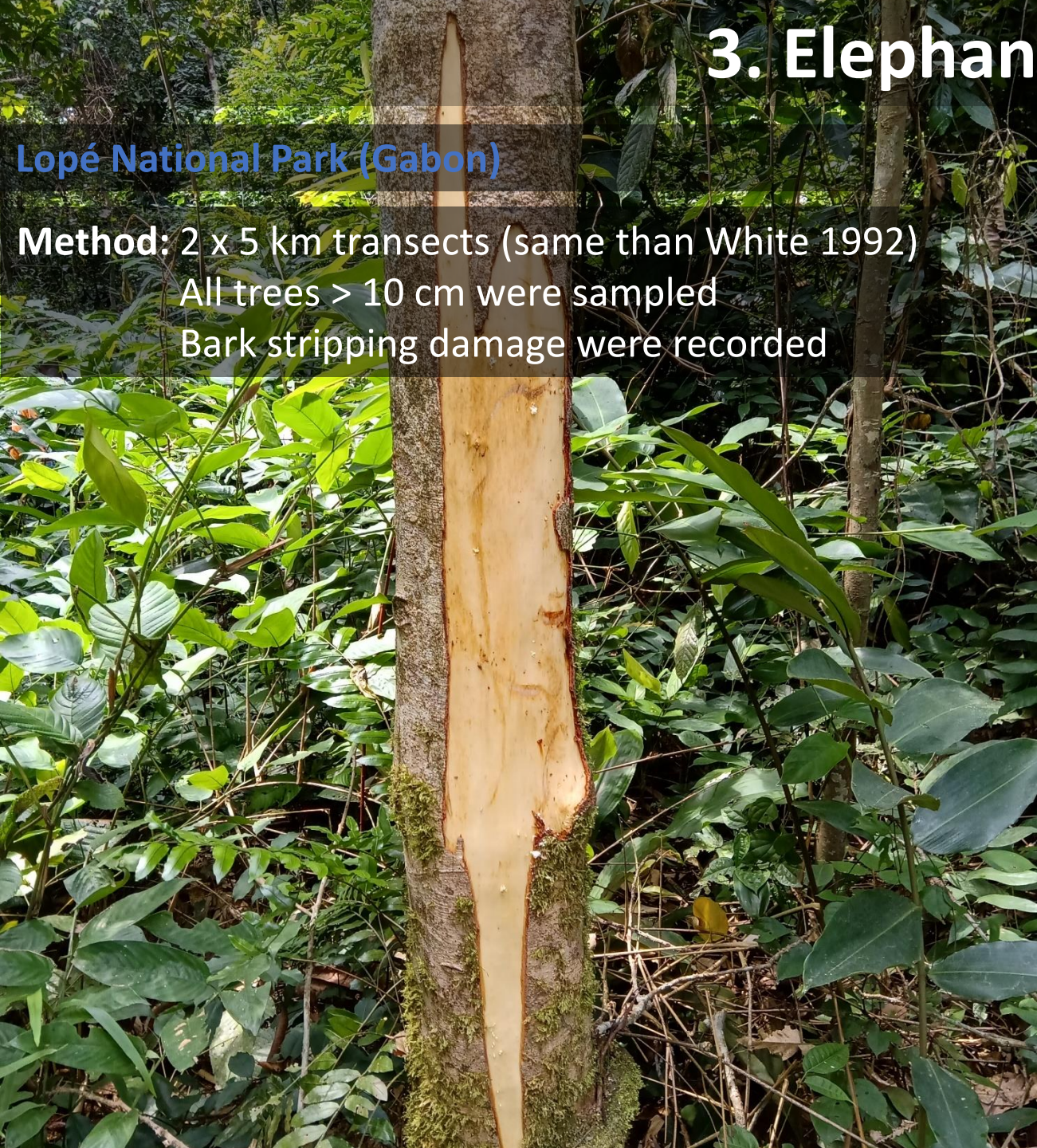
- 20% of plants were damaged
- 50% of the damage attributed to the forest elephant (uprooted, broken stem)



3. Elephant damage

Lopé National Park (Gabon)

Method: 2 x 5 km transects (same than White 1992)
All trees > 10 cm were sampled
Bark stripping damage were recorded

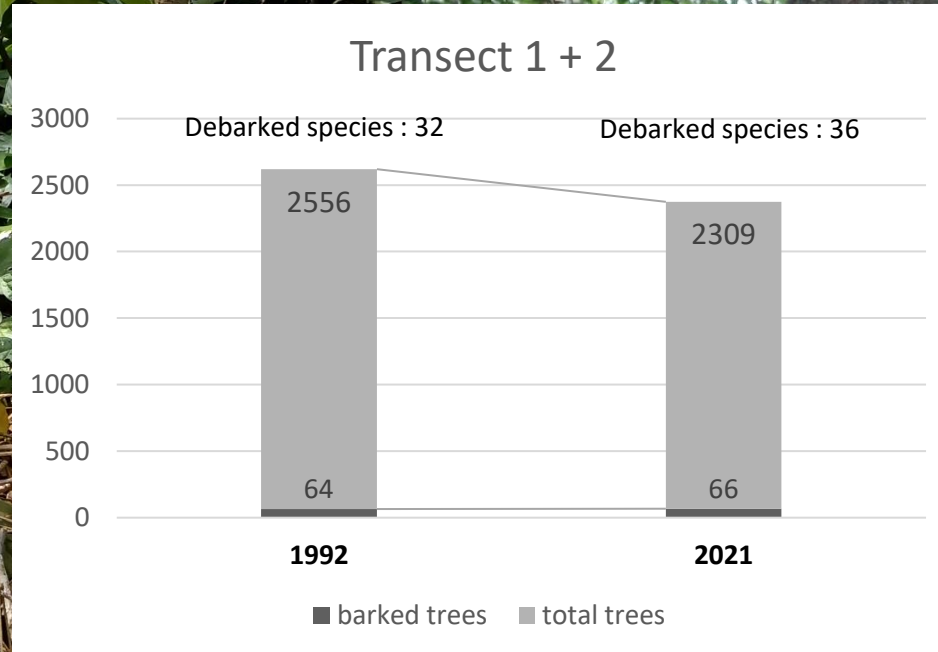


3. Elephant damage

Lopé National Park (Gabon)

Results: Between 1992 and 2021:

- the total number of individuals has decreased
- the number of debarked trees stayed almost equal
- the number of species debarked has slightly increased
- there is a shift in the species debarked



TAKE HOME MESSAGE

- Coexistence of selective and sustainable logging with forest elephants is possible
- Forest elephants play a dominant role in the regeneration of *D. macrocarpum*, *B. fistuloides*, *T. africana*, and *B. toxisperma*, 4 important timber species
- Damage to plants in reforested logging gaps seems to be mostly caused by forest elephants
- Bark stripping by forest elephants evolves over time

THANK YOU

Photo and video credits: Cornell University, C. De Souza, R. Doucet, johan63 – Getty, J. Kingdon, S. Raman, M. Scalbert, Trees for life

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