



THE ROLE OF MEGAFAUNA IN SEED DISPERSAL:

*Insights from Neotropical Savannas and
Future Comparisons with African Savannas*



Stanford University



Harvard University



FROM INDIVIDUALS TO LANDSCAPES

Seed Dispersal



PLANT REPRODUCTIVE CYCLE
AND POPULATION DYNAMICS

MAINTENANCE AND SHAPING OF
VEGETATION STRUCTURE



SUSTAINING FAUNAL BIOMASS
AND FRUGIVOROUS GUILDS

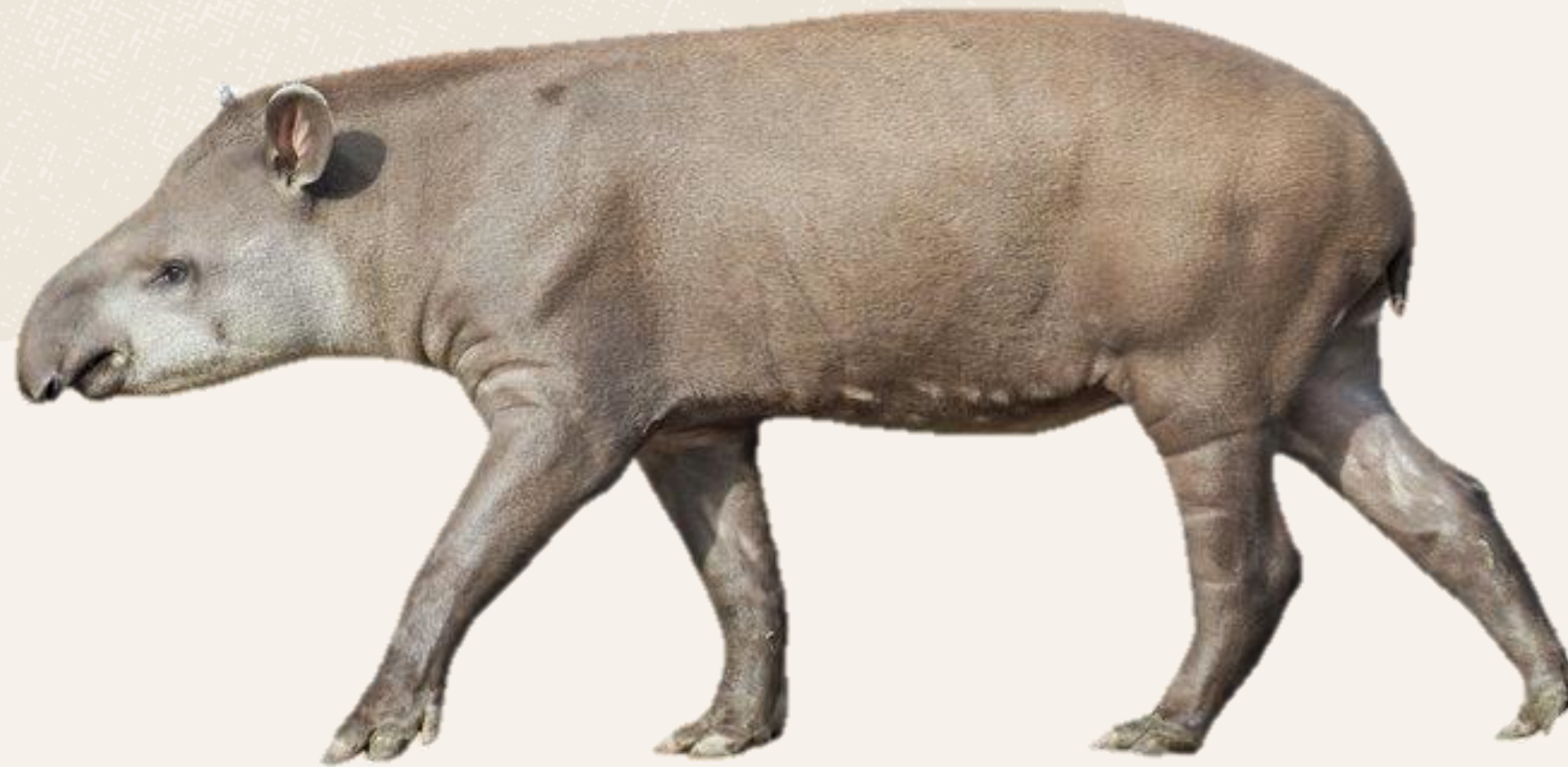
IMPACTS ON BIOGEOCHEMICAL
CYCLES AND NUTRIENT CYCLING



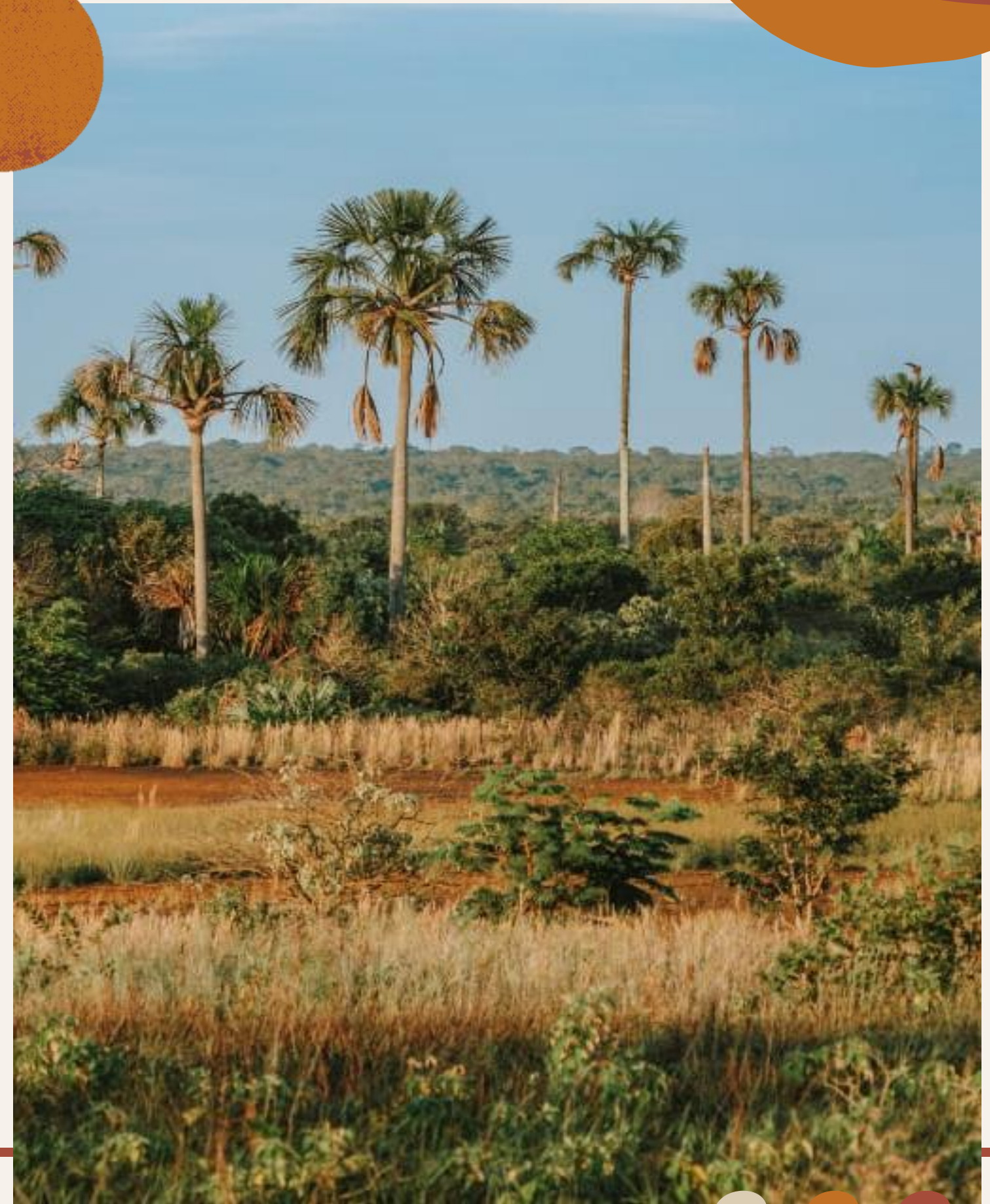
MODULATION OF FIRE
SUSCEPTIBILITY AND RESILIENCE



**LARGE ANIMALS
EAT LARGE FRUITS...**

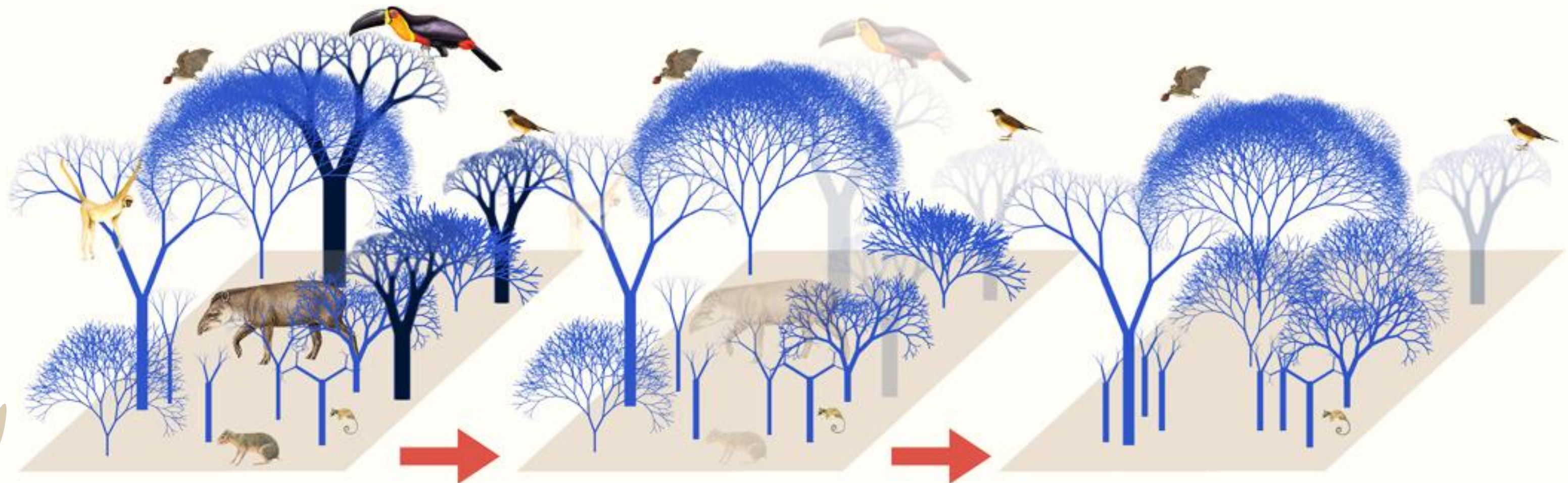


... AND PLANT LARGE TREES



Megafauna are essential for dispersing the largest plant species.

LARGE-BODIED FRUGIVORE DEFAUNATION



Initial community

Directed, nonrandom,
extinction of large-
bodied frugivores

Final defaunated community

Bello *et al.*, 2015

SEED DISPERSAL NETWORK



The matrix of links (interactions) between multiple animal and plant species



CERRADO

The most diverse Savanna in the world

Frugivory and seed dispersal in the Cerrado: Network structure and defaunation effects

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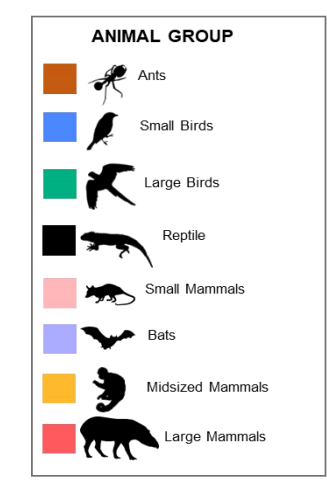
DISPERSERS

Predominance of small- to mid-sized generalist spp.
(e.g., passerines, marsupials, mesocarnivores)
Large frugivores (e.g., tapir) = pivotal role
High foraging area + dispersal of small *and* large seeds



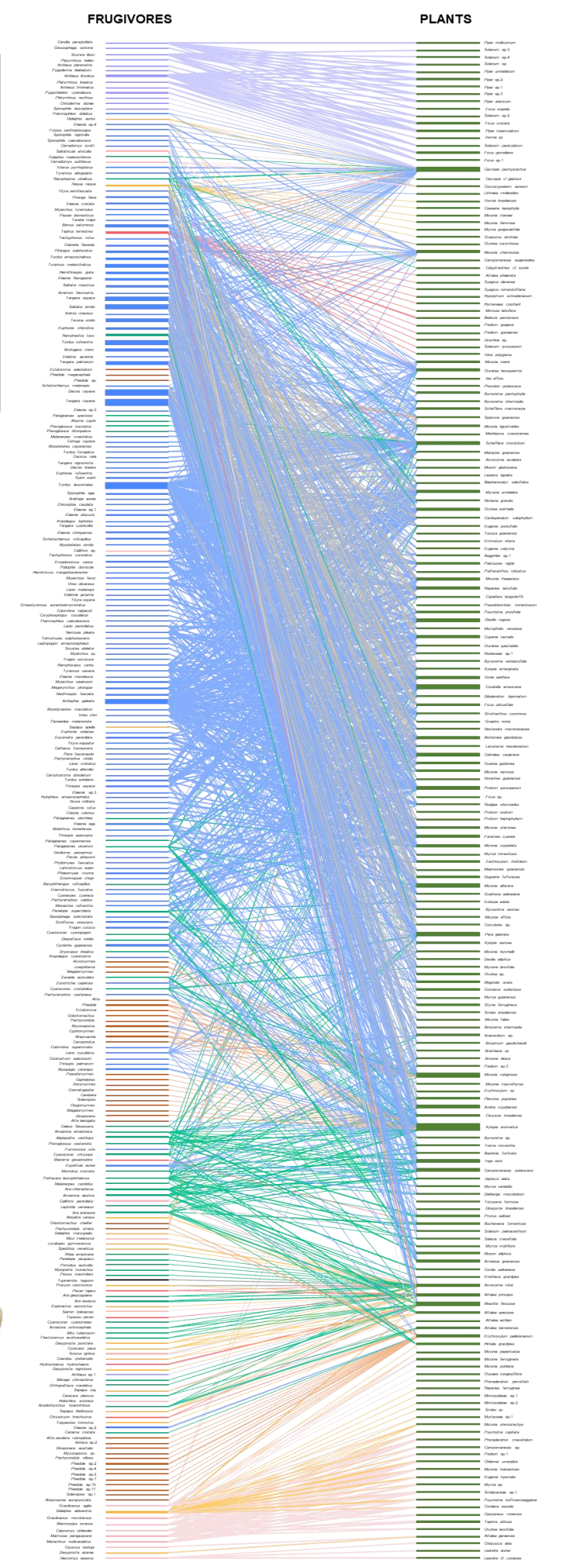
NETWORK STRUCTURE

Slightly Nested + Considerably Modular
274 animal spp. → 193 plant spp.



DEFAUNATION IMPACT

The Cerrado frugivore assemblage is moderately defaunated (DI = 0.43)
Large-fruited plants seem to have fewer interactions with Large Frugivores



PLEISTOCENE MEGAFAUNA



CERRADO

NEOTROPICAL SAVANNA

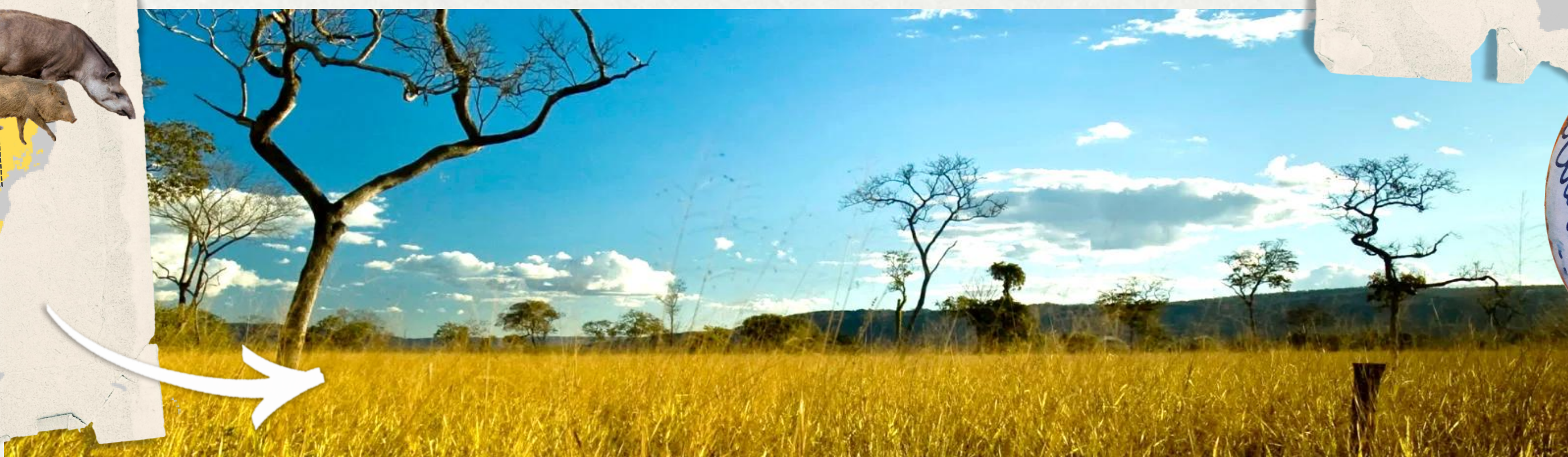


AFRICAN SAVANNAS



CROSS-CONTINENTAL COMPARISON

Kruger National Park – South Africa



Emas National Park - Brazil



EVOLUTION

SAVANNAS AS TWIN SYSTEMS

“How have megafauna historical presence shaped seed dispersal networks in savannas?”



ECOLOGY

↑% ANIMAL-DISPERSED SPP.

“What is the current quantitative contribution of megafauna to seed dispersal in savannas?”



CONSERVATION

DEFAUNATION CRISIS

“How does the ongoing loss of megafauna affect savannas’ ecosystem functioning and structure?”



EXPERIMENTAL DEFAUNATION



METHODS



Paired-control
Exclosure Plots



Field Surveys – Spp. Di
+ Eco. Param.



Focal Observation of
Frug. Interactions



Scat sampling +
Germination Tests



Savanna Comparative
Analysis



SAVANNA DRAMA: THE PLOT THICKENS WITHOUT MEGAFAUNA



Emas National Park, RBC (2025)

Kruger National Park, Holger Eckhardt (2005)

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Protect the Cerrado

Giant anteater (Myrmecophaga tridactyla)

Visit wwf.org.br/cerrado

