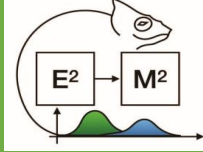# Seed dispersal by birds and lemurs in fragmented landscape

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Background

Lemurs and birds: main seed dispersers in many plant species in Malagasy ecosystems

Species are facing a high risk of decline by forest fragmentation

Habitat loss

Forest cover 2000
100%

0%

Deforestation 2000 - 2014

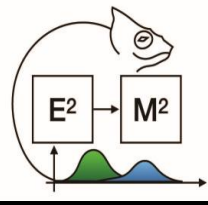Hansen et al. 2013

???STATISTICAL MODEL

What factors influence the consumption of fruit by lemurs and birds in plant species?

??? DYNAMICAL MODEL

How does competition between birds and lemurs affect seed dispersal dynamics?

What factors influence the consumption of fruit by lemurs and birds

- <u>Hypothesis</u>**:** Color, size and shape of fruit influence the consumption of fruit by birds and lemurs

- <u>Response variable</u>**:** Eaten fruit by birds/lemurs per tree

- <u>Predictor variables</u>: Fruit traits: color, size, shape; frugivores traits: size, handling fruit, sites in both edge and interior of forest

- <u>Family</u>: "poisson"

- <u>Link</u>: log

- <u>Rcode</u>: glmer(Fruit_number~color+size+shape+handling,family= poisson(link = "log"), data=tree.observation)

How does competition between birds and lemurs affect seed dispersal dynamics?
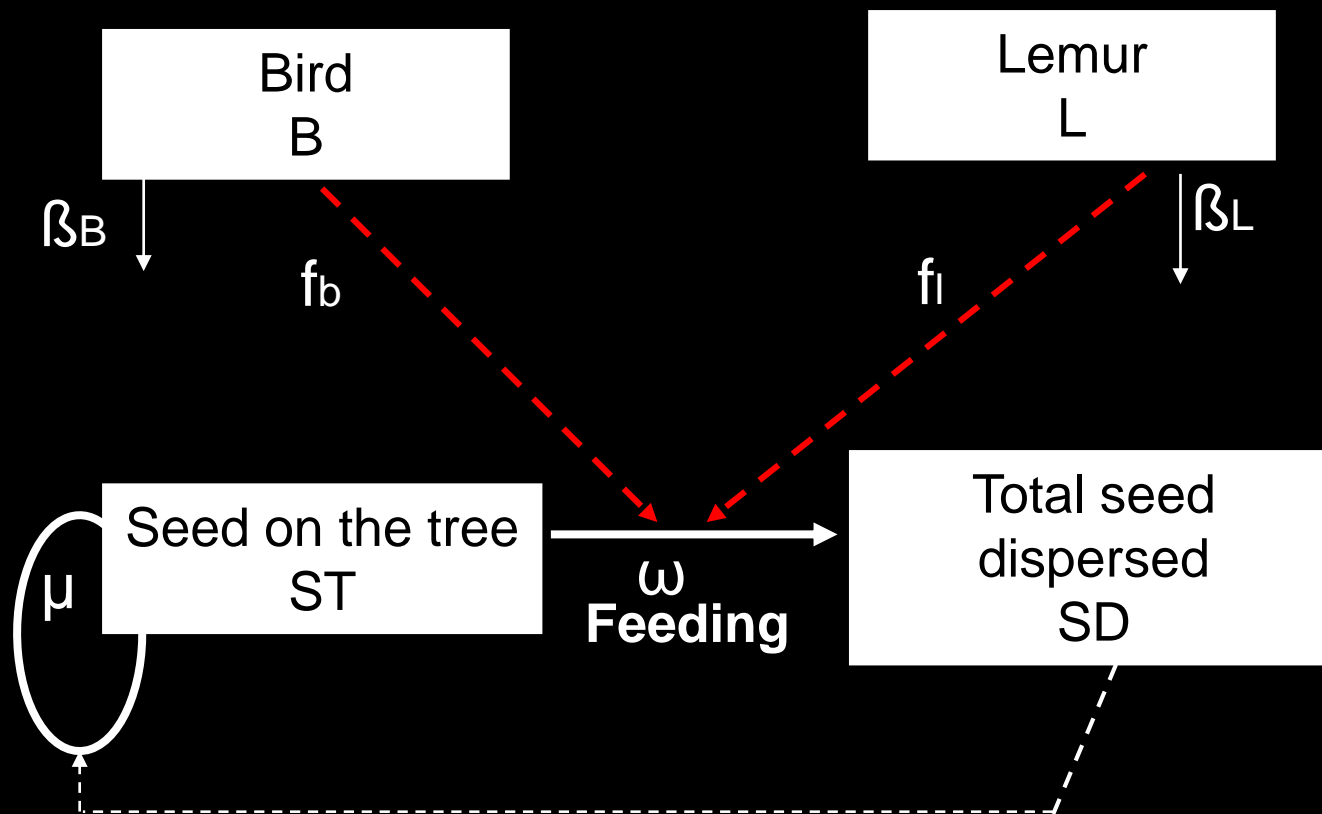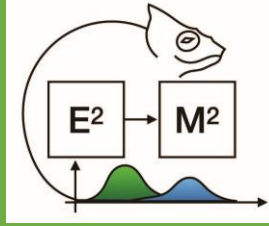
ßB: death rate of bird
ßL: death rate of lemur
μ: fructification rate
ω: feeding rate
fb: feeding rate by bird
fl: feeding rate by lemur
B: number of bird
L: number of lemurs

$S_{t+1}: \mu(ST)(SD) - \omega(ST_t) [(fb_t * B_t) + ((1-fb_t) * L_t))]$

$SD_{t+1}: \omega(ST_t) [(fb_t * B_t) + ((1-fb_t) * L_t))]$

What would be the future of the tree species if this competition disrupt by forest fragmentation?

- Collect data in the field: animal survey and camera trapping to estimate the diversity and abundance of birds and lemurs in the forest

- Built a model: simulation of the abundance of frugivores through time

- Built a model: simulation of loss of one frugivore (bird or lemur) or frugivore lower abundance through time