

Brazilian Native Bees in Natural Areas: Free Pollinators for Crops?

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Declaration of São Paulo - 1998

- ⌘ *Pollinating bees: The Conservation Link Between Agriculture and Nature*
- ⌘ Elements for the discussion of strategies to survey and to manage bees for pollination purposes.

Possibilities of managing bees for crop pollination:

- ⌘ Bees in artificial habitats
- ⌘ Resident bees in their habitat - providing more nesting opportunities
- ⌘ Habitat proportion in the landscape

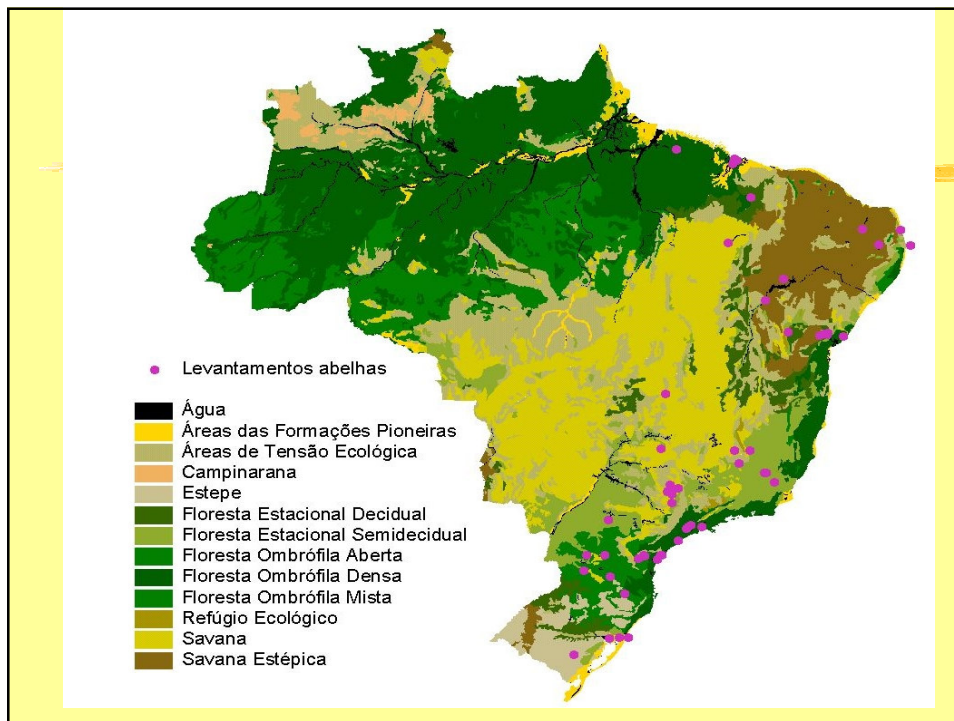
Managing habitat proportion in the landscape

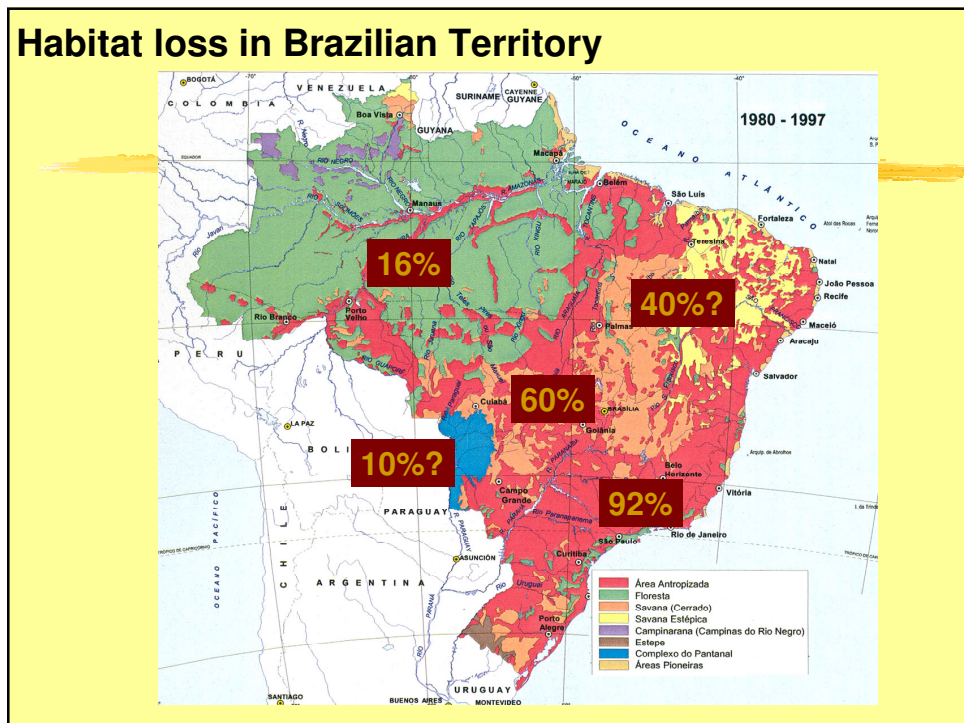
- Does it pay to manage landscape because of (free) pollination services?
- ⌘ 20%-50% are protected by law +APP's.
 - ⌘ The role of biodiversity (natural areas) is not understood by land owners.
 - ⌘ The economic value of natural areas is not known.

Managing habitat proportion in the landscape

Are there pollinators for crops in natural areas ?

- ⌘ *There are bees. (crop pollinator bees?)*
- ⌘ *Pollination takes place.*
- ⌘ Pollination x Integrated Pest Management.





Profile of good pollinator

- ⌘ Numbers
- ⌘ Floral constancy
- ⌘ Flight range
- ⌘ Morphology and behavior x flower
- ⌘ Possibility of managing

Bees in Natural Areas

- ⌘ Most species are rare, but high diversity.
- ⌘ Plant choice x constancy
- ⌘ Most species are small - flight range
- ⌘ Most are ground nesting

Potential pollinators from Natural Areas

- ⌘ Meliponina and *Bombus*, *Centris*, *Exomalopsis*, *Ceratina*, *Paratetrapedia*, *Xylocopa*, ...
- ⌘ Plant resources
- ⌘ Flight range x crop field size
- ⌘ Some common bees use artificial nest.

Native Bees in Crops

List suggested by EMBRAPA- public call PROBIO
Squash, Mellons, Alfafa, Cotton,
Eggplant, Cocoa, Cashew, Brazilian nut,
Citros, Cupuaçu, Dendê oil, Eucaliptus,
Guarana, Apple, Mango, Passionfruit,
Neen, Cucumber, Tomatoes, Urucum.
(Sunflower, Onion)

Native Bees in Crops

Published information on crop visitors

, , , Cotton,
, Cocoa, Cashew, Brazilian nut,
, , , ,
, Apple, , Passionfruit,
, , , .
(Sunflower, Onion)

The interest for native pollinator

- ⌘ Biologists: native plants.
- ⌘ Agronomists, zootechnists: management alternatives.
- ⌘ Producers: profits.
- ⌘ Government and local agencies
- ⌘ Conservation scientists and NGO: corridors

The standard protocol SP+5

- ⌘ Provide data that can launch initiatives by different actors - action
- ⌘ Add value to Natural Areas and Native Pollinators - understanding
- ⌘ Provide a feasible alternative -facilitate
- ⌘ Integrate native areas and agriculture

Brazilian Native Bees in Natural Areas: *the link between conservation and agriculture*

