

Workshop “Building the gap between forest information needs and forest inventory capacity”

Monitoring of Ecological Restoration in the Atlantic Forest of Brazil

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Outline

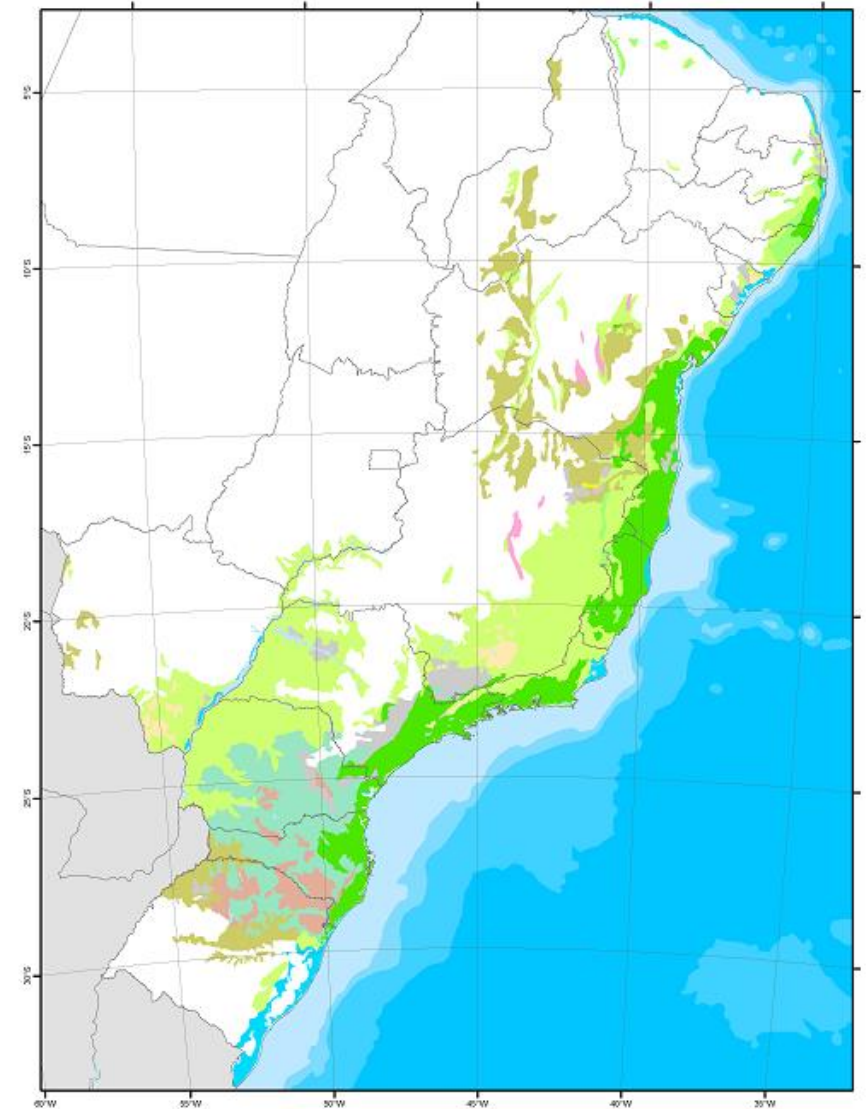
- The Atlantic Forest: background
- Ecological restoration
 - Development and implementation
 - Main challenges
- The Atlantic Forest Restoration Pact - AFRP
- Monitoring of ecological resources
 - 6 principles for forest monitoring
 - Monitoring ecological restoration
- AFRP Monitoring Protocol: ecological dimension
- Rio de Janeiro case study
- Conclusion

The Atlantic Forest: Background

- Location: South-East of Brazil
- Total area: 1.1 million km² (13% of the total country area)
- World Biodiversity Hotspot with 276 endangered species

Socio-economic characteristics:

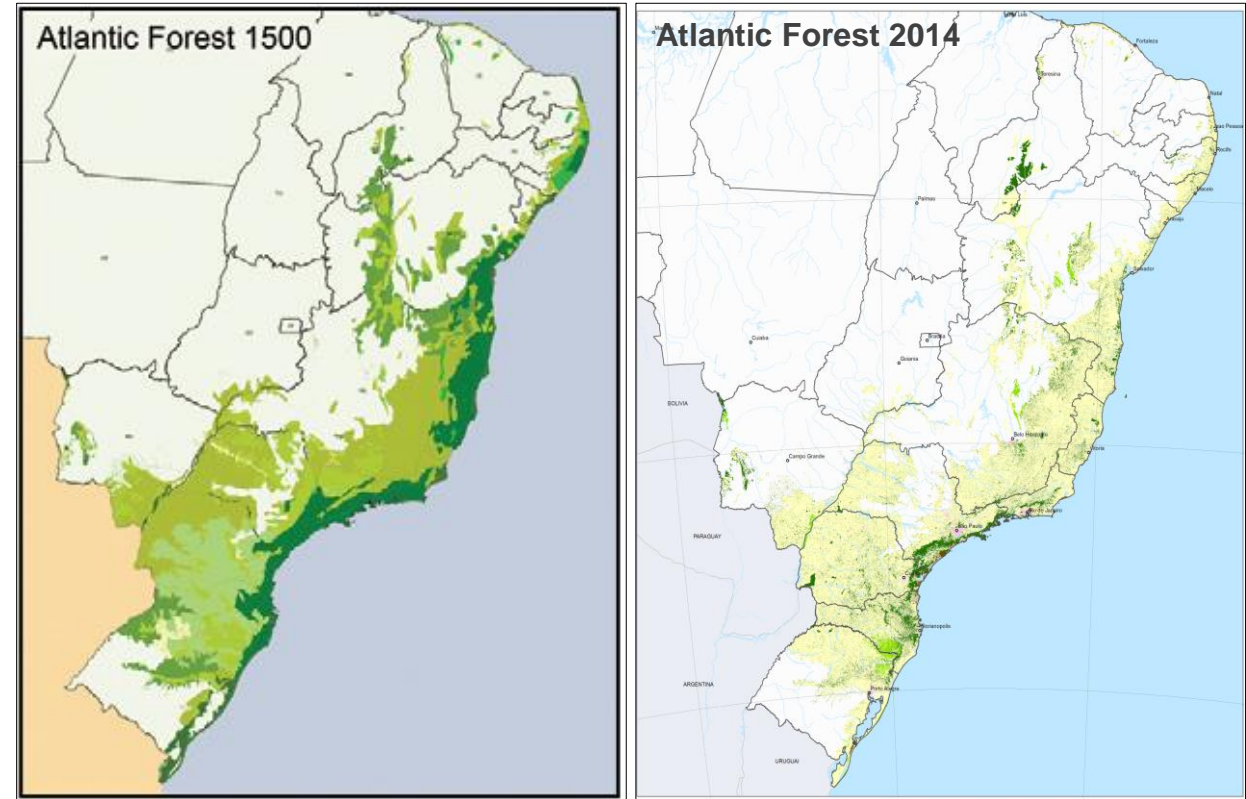
- More than 100 mln population (60% of total Brazilian population; 90% in urban areas)
- 3000 municipalities in 17 states
- 80% of Brazilian GDP mainly from industrial and agricultural sector



Source: SOS, 2015

The Atlantic Forest: Impacts

- Forest, agriculture, pasture and urbanization
- Loss of 87% original forest cover (12.5% rainforest or 15% total forest remnants)
- 245,173 forest fragments; 20% are less than 50 ha
- Pasture use and agricultural impact continues to dominate



Source: SOS 2008; 2015

Ecological Restoration: development and implementation

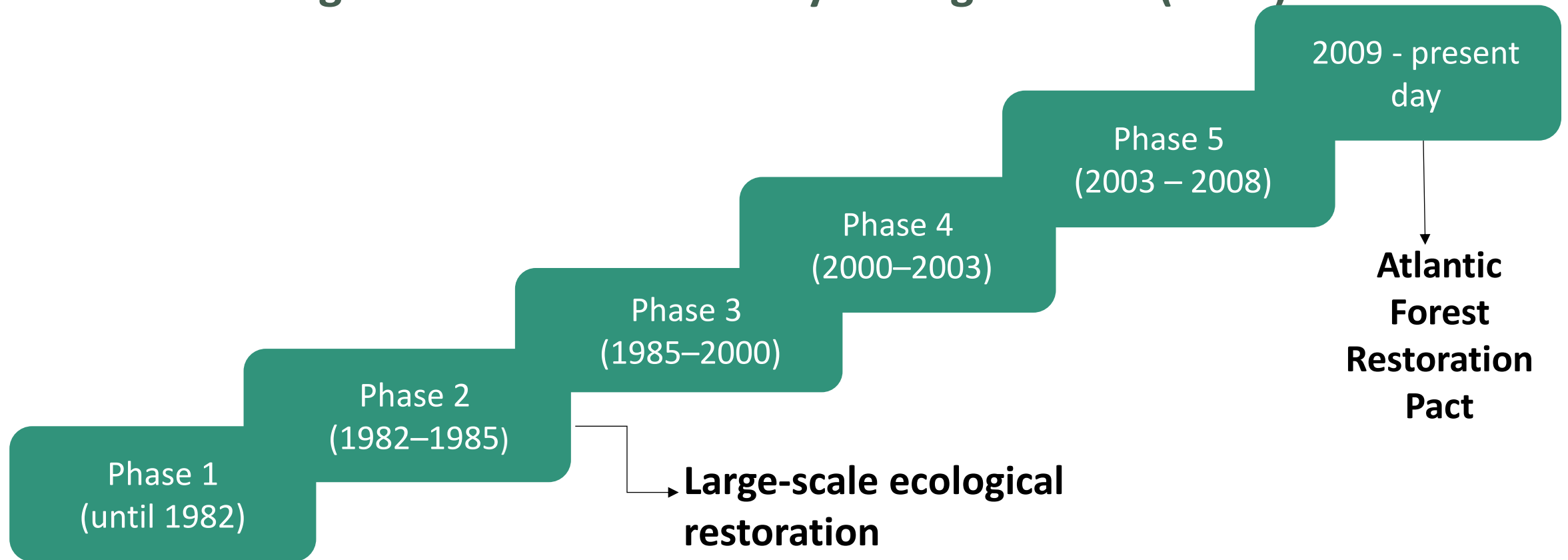
Legal framework

- Brazilian Forest Code (1934)
 - Forest protection and restoration
 - Reconcile private forest land use and biodiversity conservation
 - Number of revisions: highly contested revision of 2012
- National Environmental Policy (1981)
 - Private companies involvement in forest restoration
- Atlantic Forest Law (2006)
 - More restrictions on forest vegetation removal
 - Provisions on rewarding and penalizing

Ecological Restoration: development and implementation

Ecological restoration is “the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed” (SER, 2004, p. 2).

Phases of ecological restoration in AF by Rodrigues et al (2009):



Ecological Restoration: Challenges of implementation and monitoring

- Weak enforcement of the legal framework
- Low incentives for farmers and business entities
- Poor coordination of multiple programs and projects
- Inappropriate monitoring tools: limited number of indicators --> poor information
- Insufficient financial and technical capacity
- Overall low impact on the forest with small areas restored



Atlantic Forest Restoration Pact – AFRP



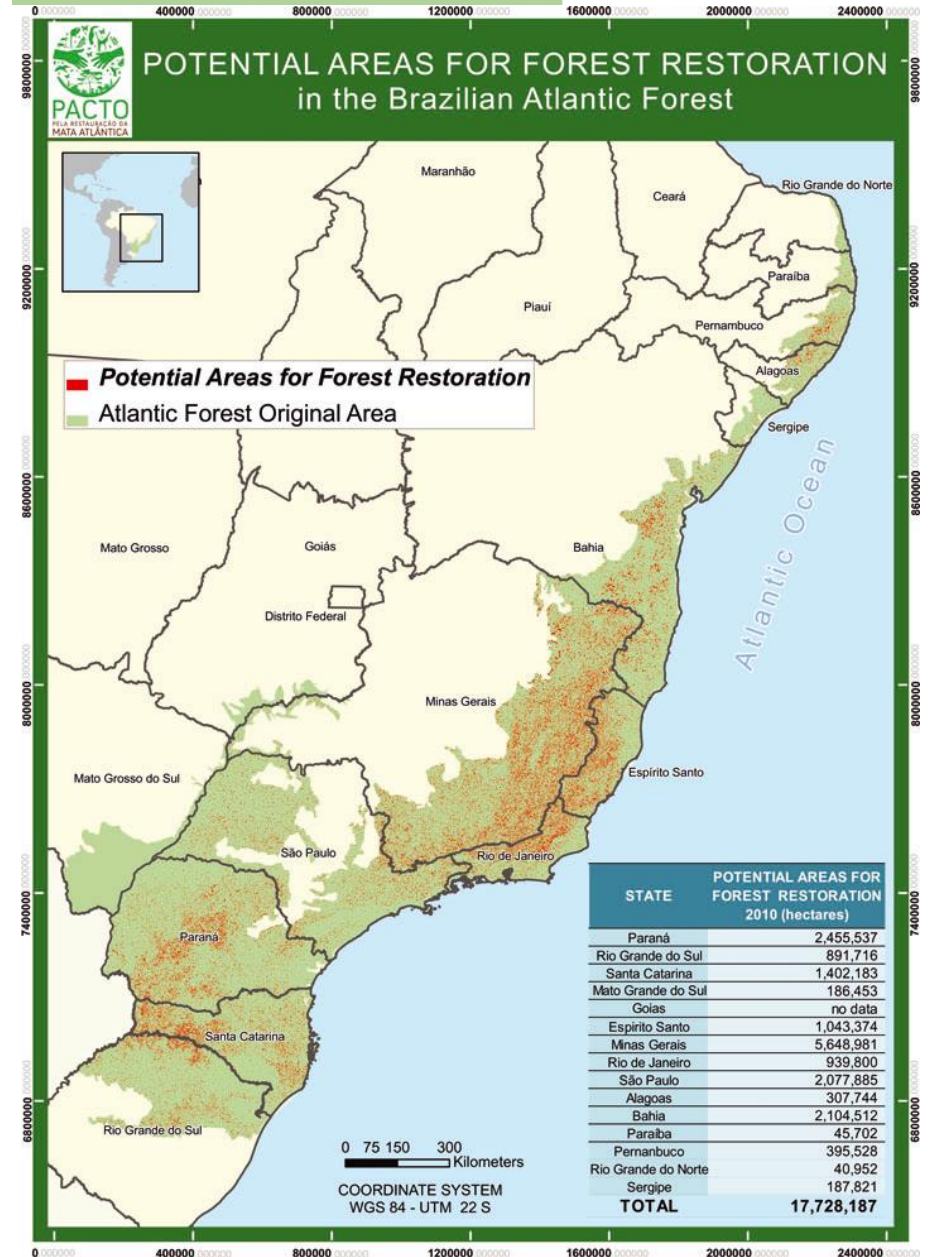
ATLANTIC FOREST
RESTORATION
PACT

- Established in 2009
- Over 200 stakeholders (supporting and executive partners)
- Aim: to improve restoration technology and capacity building in a large scale
- Target by 2050: 15 million hectares of restored forest lands
- Products: Theoretical Reference Book, Standardize Monitoring Protocol, Maps (www.pactomataatlantica.org.br)

AFRP – Products

- Map of potential areas for restoration in the Brazilian Atlantic Forest
- More than 17 million hectares of potential areas
- Brazil has a large territory of fertile soil used as unproductive land, with low agricultural or low livestock productivity which can be used for restoration.

Source: Calmon, 2011



Monitoring of Ecological Resources

- Monitoring is a procedure of measurement and periodic evaluation, which can imply changes in indicators from the expected pattern
- 6 principles for planning forest monitoring: relevance, accessibility, reliability, efficiency, sustainability, and strategic coordination
- Accessibility can be guaranteed by some criteria as *user friendly tool* and an effective communication among users and producers of information

AFRP Monitoring Protocol

- It's a reference guide for monitoring restoration projects in the Atlantic Forest
- Includes a set of dimensions, criteria and 87 indicators covering biological, economic, social, legal, environmental, and management themes
- Example of user friendly data access tools and output format
- Ecological dimension monitoring: **Phase1** – Canopy cover and **Phase 2** – Ecological Trajectory Monitoring

AFRP Monitoring Protocol: Ecological Restoration

PHASE II - ECOLOGICAL TRAJECTORY	
Item	Description
C_1. Structure	Vertical and horizontal distribution of the plant community undergoing restoration.
I_1.1. Density of small sized woody plants.	Number of small-sized specimens of non-invasive shrubs and trees per area.
M_1.1.1. Amount of specimens of non-invasive species per area.	Count of non-invasive individuals per area with height (H) \geq 0.5 m and <i>DBH</i> < 15 cm.
I_1.2. Density of large size woody plants.	Number of large size individuals of non-invasive shrubs and trees per area.
M_1.2.1. Amount of woody plants of non-invasive species per area.	Count of individuals of non-invasive individuals per area with <i>DBH</i> \geq 15 cm.

C: Criteria; I: Indicators; M: Metrics

Source: PACTO, 2013

Rio de Janeiro Case Study

- Applicability of AFRP tools by the INEA (the Environmental State Agency of RJ state)
- INEA innovation for monitoring compensatory measures for forest restoration: *Restauradora* – forest restoration calculator
- RJ state restoration commitment of around 12, 266 hectares
- Only 3,628 hectares implemented and are under monitoring



Source: Bustamante, 2012

Conclusions

- Effective policies combined with large-scale ecological restoration can promote Atlantic Forest regeneration
- The AFRP Monitoring Protocol is a new essential tool for continuous monitoring and evaluation
- **AFRP challenges:**
 - complex structure of stakeholders from diverse sectors and levels;
 - dissemination of methods, techniques and processes through its members;
 - bottlenecks related to training and capacity building.
- **AFRP achievements:**
 - case of successful governance;
 - establishment of highly scientific and technological expertise;
 - development standardized methodologies;
 - substantial amount of lessons learned and best practices.

Thank you for your attention!



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