COURSE REPORT

Introduction to the Ecology and Strategies for Tropical Forest Restoration in Human-Modified Landscapes

March 24 to May 5, 2014
An online course organized by:
The Environmental Leadership and Training Initiative (ELTI)

Background: In Brazil and Latin America as a whole, tropical forests and the variety of environmental services they provide are being lost as drivers of deforestation and degradtion lead to alternative land-uses. As the damaging effects of deforestation are being observed, there has also been increasing interest in the conservation and restoration of tropical forests. The momentum for tropical forest restoration in Brazil can exemplified by the legal incentives included in Brazil's Forest Code, the formation of the Atlantic Forest Restoration Pact, and the leadership of many national and international organizations in promoting forest restoration in the country. However, many restoration projects fail over time because the species and methods employed do not match the biophysical and social conditions of the restoration site. Understanding the ecological processes that relate to forest functioning can guide decision-making and the development of strategies for effective forest restoration and sustainable land management.

This online course was designed to provide an introduction to the concepts and techniques needed to plan and implement strategies for the restoration of forests and ecosystem services in multiple-use landscapes. The course was offered to practitioners and professionals working for government agencies, NGOs, and the private sector looking to advance their knowledge about tropical forest ecology and restoration through a series of presentations, discussions, and activities that guide the development of a restoration management plan. Additionally, this course provided the opportunity for participants to meet and share experiences, concepts, and tools with each other, the ELTI facilitators and guest experts.

Format: This six-week course was offered in Portuguese and was divided into thematic modules, each one lasting a week. The thematic modules were:

Module 1. Ecology and natural regeneration of tropical forests

Module 2. Effects of anthropogenic disturbance on regeneration

Module 3. Strategies to catalyze restoration in the tropics

Module 4. Influence of sociopolitical factors on restoration

Module 5. Monitoring and follow-up of restoration projects

Module 6. Completion of a restoration management plan

The participants were allowed to complete their assignments according to their own schedules within that week, with assignments due on Sunday night at the end of each week.

ELTI is a joint initiative of:

Yale SCHOOL OF FORESTRY & ENVIRONMENTAL STUDIES

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Instructors and Coordinators: The delivery and management of the course was facilitated by **Matheus Couto**, a Brazilian M.F.S. student at the Yale School of Forestry & Environmental Studies (F&ES), and supervised by **Gillian Bloomfield,** ELTI's Web-Based Training Program Coordinator with an M.F.S. from Yale F&ES.

Detailed feedback on the participant's preliminary management plans was provided by guest expert Dr. **Daniel Piotto**, who is an Associate Research Scientist at the Floresta Viva Institue in Brazil with a Ph.D. from Yale F&ES.

Recorded lectures and videoconferences were delivered by:

- **Maria José Brito Zakia**, Ph.D., Práxis environmental consulting, Advisor to the Institute for Research and Forest Studies (IPEF), Brazil;

- **Alicia Calle**, MESc, Program in Environmental Studies, University of California Santa Cruz, United States;

- **Sergius Gandolfi**, Ph.D., Laboratory for Ecology and Forest Restoration (LERF), School of Agriculture Luiz de Queiroz (ESALQ), University of São Paulo, Brazil;

- **William Laurance**, Ph.D., School of Marine and Tropical Biology, James Cook University, Australia;

- **Aurelio Padovezi,** M.Sc., Forest Restoration Program, The Nature Conservancy (TNC), Brazil;

- **Severino Rodrigo Ribeiro Pinto,** Ph.D., Center for Environmental Research of the Northeast (CEPAN), Brazil;

- **Ricardo Ribeiro Rodrigues,** Ph.D., Laboratory for Ecology and Forest Restoration (LERF), School of Agriculture Luiz de Queiroz (ESALQ), University of São Paulo, Brazil;

Additional support in content review from:

- **Mark Ashton,** Ph.D., Yale University, School of Forestry & Environmental Studies, United States.

- **Pedro Brancalion,** Ph.D., School of Agriculture Luiz de Queiroz (ESALQ), University of São Paulo, Brazil.

- **Amity Doolittle,** Ph.D., Yale University, School of Forestry & Environmental Studies, United States.

- **Eva Garen,** Ph.D., Environmental Leadership and Training Initiative at Yale University, United States.

- **Florencia Montagnini,** Ph.D., Yale University, School of Forestry & Environmental Studies, United States.

- **Francisco Román,** Ph.D., University of Florida and Madre de Dios Consortium, Peru.

Recording and editing support for the pre-recorded guest lectures was provided by the Yale Broadcast Center and the Institute for Forest and Agricultural Management and Certification (IMAFLORA) in Piracicaba, São Paulo, Brazil.

Participants: Participants were selected from a large pool of applicants for their achievement and potential as environmental decision-makers involved in natural resource management or restoration in Brazil. They came from ten states within Brazil and work for local and national governments, non-governmental organizations, private companies, academia, and public-private partnerships.

Educational Tools:

- Interactive presentations that provided a synthesis of the core concepts of each week;
- Pre-recorded guest lectures that simultaneously depicted the video and audio of the guest speaker along with the PowerPoint slides;
- Optional and required readings to complement the presentations;
- Case studies providing restoration examples in Panama and Mexico;
- Two optional discussion sections conducted live with guest experts;
- Weekly short answer assignments which evaluated the participant's understanding of the content; and
- Discussion forums for individual and group work towards the creation of a final project: a preliminary management plan for restoration on a site of professional interest.

In addition to the discussion forum, the work toward the final project included one site visit, feedback from the guest expert, the peer-to-peer exchange of drafts, and literature searches using ELTI's **Tropical Native Species Reforestation Information Clearinghouse** (reforestation.elti.org). At the end of the course, each participant who completed all of the course requirements received a certificate of participation.

Course Objectives:

- Present the basic principles of forest ecology, natural and anthropogenic disturbances, and how those disturbances affect the potential for regeneration;
- Provide the knowledge to evaluate and compare an array of tropical forest restoration methodologies and how the biophysical and socioeconomic conditions of a site influence the decision-making about which strategies to utilize;
- Allow participants to analyze the ecological conditions, disturbance history, sociopolitical factors, and monitoring plans for the adaptive management of a specific restoration site; and
- Provide the opportunity for participants from different states of Brazil to meet and share experiences, concepts, and tools with each other, the ELTI facilitators, and guest experts.

Outcomes and Follow-up: The majority of participants were actively engaged throughout the course. Twenty-six of the participants successfully completed their preliminary management plan and benefited from the feedback they received from the instructors and their peers. In the months following the course, ELTI will follow-up with the participants to see how the course and the term paper have influenced their professional development and management of their individual restoration sites.