

## COURSE REPORT

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

**May 13 to June 23, 2013**

An online course organized by:

The Environmental Leadership and Training Initiative (ELTI)

**Background:** In Latin America and around the world, tropical forests are rapidly disappearing and, along with them, the loss of a variety of environmental services that maintain the diversity of life on this planet. As the damaging effects of deforestation are being observed worldwide, there has also been increasing interest in the conservation and restoration of tropical forests. 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.

The various agencies and actors involved in restoring degraded and deforested lands oftentimes establish single-species tree plantations, in many cases using short-rotation exotic species which can do little to restore the biodiversity and functioning of forest ecosystems. Meanwhile, in the tropics there are hundreds to thousands of tree species native to a region that have potential to provide economic and ecological benefits if used for reforestation. In addition to reforestation, there is a wide range of interventions that restore tree cover, such as assisted natural regeneration and direct seeding, which can be selected based on the particular conditions of a site. Therefore, 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 aimed to provide an introduction to the concepts and techniques needed to develop and implement strategies for the restoration of forests and ecosystem services in multi-use landscapes. The course was designed for 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, readings, and case studies. Additionally, over the duration of the course, weekly assignments and the final term paper guided the participants to develop preliminary restoration plans for managing a specific site of professional interest.

### 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 diverse regions of Latin America to meet and share experiences, concepts, and tools with each other, the ELTI facilitators, and guest experts.

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**Format:** The course took place over the course of six weeks and was divided into thematic modules, each one lasting a week. The participants were allowed to complete their assignments anytime according to their own schedules within that week, with assignments due on Sunday night at the end of each week.

The thematic modules were:

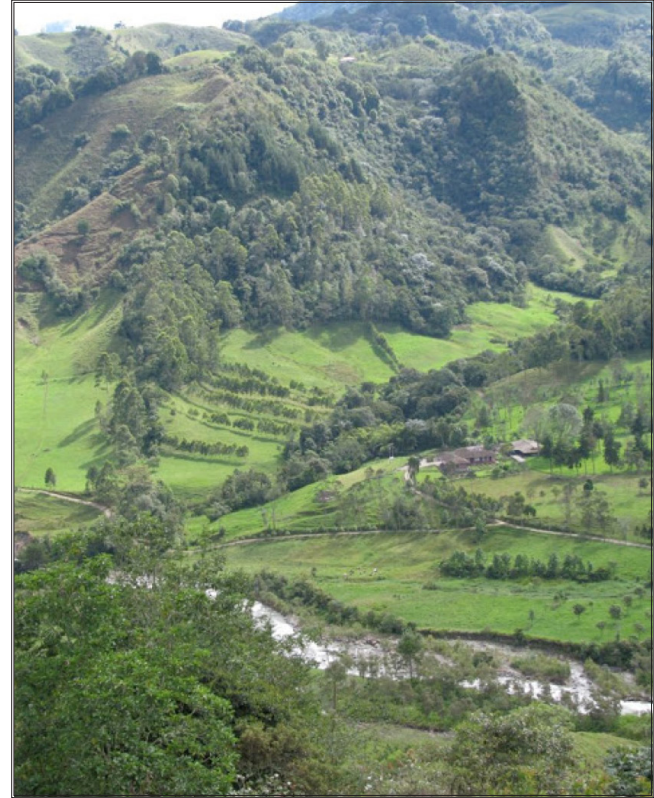
- Module 1.** Ecology and natural regeneration of tropical forests
- Module 2.** Effects of anthropogenic disturbance on regeneration
- Module 3.** Strategies to catalyze restoration in the tropics
- Module 4.** Influence of sociopolitical factors on restoration
- Module 5.** Monitoring and follow-up of restoration projects
- Module 6.** Completion of a restoration management plan

The teaching tools used in the course consisted of:

- Interactive presentations that provided an overview of the core concepts of each week;
- Pre-recorded guest lectures that simultaneously depicted the video and audio of the speaker along with the PowerPoint slides;
- Optional and required readings to complement the presentations;
- Case studies in week four providing restoration examples in Panama and Mexico;
- Two optional discussion sections conducted live with Dr. Florencia Montagnini, Yale School of Forestry & Environmental Studies;
- 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, the peer-to-peer exchange of drafts of the preliminary management plan, literature searches using ELTI's **Tropical Native Species Reforestation Information Clearinghouse** ([reforestation.elti.org](http://reforestation.elti.org)), and detailed feedback provided by Dr. Dylan Craven, a recent graduate of the Ph.D. program at the Yale School of Forestry & Environmental Studies.

At the end of the course, each participant who completed all of the course requirements received a certificate of participation.



Módulo 3: Estrategias para catalizar la restauración

Lección 3:  
La restauración de bosques y servicios ambientales en paisajes intervenidos



Asesorada por: Dr. Francisco Román, Universidad de Florida, Consorcio Madre de Dios, Perú  
Escrita por: Gillian Bloomfield, Iniciativa de Liderazgo y Capacitación Ambiental de Yale

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Yale SCHOOL OF FORESTRY & ENVIRONMENTAL STUDIES

Herbario Tropical University of Panama

Zoraida Calle, MSc  
Centro para la investigación en sistemas sostenibles de producción agropecuaria

**Un coinvestigador no es sólo un asistente de campo**

- El papel del asistente de campo termina con la entrega de los registros.
- El coinvestigador puede participar en etapas posteriores del proceso de investigación, dependiendo de sus metas de formación.



**Instructors and Coordinators:** The interactive presentations were designed and developed internally by staff and interns at ELTI and reviewed by guest experts including:

- Dr. Mark Ashton, Yale University, School of Forestry & Environmental Studies, United States.
- Dr. Eva Garen, Environmental Leadership and Training Initiative at Yale University, United States.
- Dr. Florencia Montagnini, Yale University, School of Forestry & Environmental Studies, United States.
- Dr. Francisco Román, University of Florida and Madre de Dios Consortium, Peru.

The pre-recorded guest lectures were developed and delivered by:

- Alicia Calle, MEd, Program in Environmental Studies, University of California Santa Cruz, United States.
- Zoraida Calle, MSc, Restoration Ecology Program, Center for Research in Sustainable Agricultural Production Systems (CIPAV), Colombia.
- Dr. William Laurance, School of Marine and Tropical Biology, James Cook University, Australia.
- Dr. Florencia Montagnini, Yale University, School of Forestry & Environmental Studies, United States.

The delivery and management of the course was facilitated by Gillian Bloomfield, ELTI's Web-Based Training Program Coordinator, and the teaching assistant José Medina Mora, a recent graduate of the F&ES Master's Program. One pre-recorded lecture was developed by Gillian Bloomfield and delivered by José Medina Mora. Recording and editing support for the pre-recorded guest lectures was provided by the Yale Broadcast Center.

**Participants:** We initially received 378 applications to participate in the online course. Applicants included forest managers, agronomists, consultants, and other types of practitioners from diverse institutions involved in natural resource management or restoration in Latin America. From this pool, we selected 25 participants from 8 countries (Argentina, Bolivia, Brazil, Colombia, Costa Rica, Mexico, Panama, and Peru) from local and national governments, non-governmental organizations, private companies, academia, and public-private partnerships.

**Outcomes and Follow-up:** The majority of participants were actively engaged throughout the course. Twenty 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. Additionally, by means of ELTI's Leadership Program, three of the course participants were offered a scholarship to attend the "III Ibero-American and Caribbean Conference on Ecological Restoration" held in Bogota, Colombia July 29-31, 2013.



*This event was possible thanks to Arcadia Fund, whose Environmental Conservation grants support programmes that protect and enhance biodiversity, and provide field training and academic research. For more information about ELTI, please visit our website: <http://environment.yale.edu/elti>.*