Environmental Leadership & Training Initiative

BLENDED COURSE REPORT

Ecological Restoration Strategies for Productive Landscapes

Online and the Darien Province, Panama
October-November 2021

A field course organized by:
The Environmental Leadership & Training Initiative (ELTI),
The Peregrine Fund and Fundación Rapaces y Bosques de Panamá

Participants learn about mixed species agroforestry systems at the El Roble Farm.

ESTRATEGIAS PARA
LA RESTAURACIÓN ECOLÓGICA

Background: The Darién Province and adjacent Wargandi and Emberá-Wounaan indigenous territories contain most of Panama's natural tropical forest ecosystems, rich in diverse flora and fauna. However, the region has suffered in recent years from increased deforestation and land degradation from unsustainable logging and conventional agriculture and livestock. These practices have impaired ecosystem services, including the fragmentation of local wildlife habitat for emblematic mega-fauna such as the harpy eagle (*Harpia harpyja*), the national bird of Panama. To avoid further forest degradation and negative environmental consequences, local communities need to learn about more sustainable agricultural activities and be trained on how to implement them.

ELTI is an initiative of:

Yale SCHOOL OF THE ENVIRONMENT
The Forest School

With the support of The Peregrine Fund and Fundación Rapaces y Bosques de Panamá, ELTI developed a blended online and field-based course for Emberá-Wounaan community leaders from the Darien Province and adjacent Emberá-Wounaan indigenous territories, who are interested in conducting forest restoration and agroforestry systems. This course provided the practical basis to understand the importance of the benefits that originate from forest ecosystems and how to implement a range of restoration strategies. Participants learned about agroforestry systems, which help increase wildlife habitat, augment biodiversity, reduce fragmentation of landscapes and enhance the agrarian livelihoods of local people by increasing farm resilience.

Objective: The overall goal of the course was to train participants on the role that forests play in providing ecosystem services and how forest restoration strategies such as agroforestry systems can be utilized for wildlife conservation and sustainable agricultural production.

Course Structure: This course was originally planned to occur in ELTI's Training Landscape in the Azuero Peninsula. Due to the COVID-19 pandemic, the course was facilitated by utilizing pre-recorded presentations to teach introductory themes and complimented by field visits to the El Roble Farm in Metetí, Darién Province. Participants incorporated newly acquired knowledge into a farm management plan that will be implemented in their communities afterwards.

The thematic modules were:

Module 1: *Forest ecology and ecosystem services*

Module 2: *Deforestation and soil degradation*

Module 3: *Strategies for restoring ecosystem processes in agricultural landscapes*

Module 4: *Agroforestry systems and the propagation of native tree species*

Module 5: *Farm management planning for sustainable production and ecological restoration*

Participants learned about agroforestry from prerecorded presentations, by Panama Coordinator Jacob Slusser.

Pre-recorded multimedia: Presentations and videos were developed by ELTI Panama Coordinator Jacob Slusser and edited by Program Associate Saskia Santamaría. With the help of The Peregrine Fund Panama Coordinator, José de Jesús Vargas González, course participants watched the pre-recorded presentations and technical videos in their individual communities. Participants later attended online live sessions with ELTI Panama affiliates to ask questions about the presentations and videos.

Participants listening to an introductory lecture by El Roble Farm owner Nicolás Bravo.

Participants practice making organic fertilizer using local materials

A participant presents her agroforestry farm map during a group exercise.

Field visit: Participants visited the El Roble Farm, an intensive agroforestry farm, owned and operated by Nicolás Bravo. At the farm, they visited several restoration strategies including: a rainwater harvesting system, a multi-strata shade coffee agroforestry system, silvopastoral system, riparian areas restored via natural regeneration, and native species reforestation. Participants learned how to make organic fertilizer and design an agroforestry system. In addition, participants developed farm maps, incorporating their desired agroforestry systems, which were later integrated into their farm management plans. During the visit, Nicolás discussed many of the challenges and lessons learned from implementing forest restoration and sustainable agricultural activities over the past decade. Participants were very impressed with the productive results from such a small farm and inspired by Nicolás' message of working in harmony with nature and becoming less dependent on outside inputs.

After the visit, participants worked in groups to develop farm management plans designed for their properties. Participants watched a prerecorded ELTI lecture on the ten-step farm planning process. The presentation described how to draw a farm map, analyze, and rate their current farm via eight indicators, develop a restoration action plan, and then draw a farm map to illustrate future interventions. Each participant presented their plan and received feedback. With the help of The Peregrine Fund and local Panamanian authorities, participants will utilize the plan to establish their model agroforestry farms. Beyond increasing productivity, these farms will serve as training sites for other stakeholders.

Nicolás Bravo explains agroforestry system spacing and species selection.

Participants: The course was offered to 18 participants, such as extension agents from Panama's Ministry of Environment (MiAmbiente) and Emberá and Wounaan indigenous community leaders from the Darién Province and adjacent Emberá-Wounaan indigenous territories. These leaders will implement forest restoration, agroforestry, and sustainable livestock production as part of a project they were awarded.

Participants visit a multi-stratified agroforestry system with turmeric, bananas, and fruit trees.

Instructors and Coordinators: Jacob L. Slusser (Panama Coordinator, ELTI's Neotropics Training Program) served as the lead instructor for the online course component and recorded all the presentations and technical videos. Saskia Santamaría (Associate, ELTI's Neotropics Training Program) edited and produced the videos. José de Jesús Vargas González, (The Peregrine Fund Panama Program Coordinator and Director of Fundación Rapaces y Bosques de Panamá) facilitated the online viewing of the presentations, field visit and farm planning session. Nicolás Bravo (El Roble Farm) facilitated the agroforestry farm visit and group activities.

Outcomes and Follow-up: 18 farm management plans were developed during the course. ELTI will work in collaboration with The Peregrine Fund and Fundación Rapaces y Bosques de Panamá to provide continued support to put the plans into action and help alumni to become community environmental leaders and disseminate knowledge. ELTI's goal is to empower their alumni so that they make positive land-use decisions and inspire others. The course received an overall 4.9 rating (out of 5) from participants, who were enthusiastic to implement their personal farm plans.

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.