

EARTHWATCH INSTITUTE FIELD REPORT

Project Title: Galapagos Invasion - The Los Gemelos Project

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Position/Affiliations: Associate Professor, Eastern Michigan University/ Head of Botany
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Research Site(s):

Los Gemelos Site (latitude -0.626/longitude -90.38), Santa Cruz Island, Galapagos Islands, Ecuador

Local Management Status of the Research Site(s):

Galapagos National Park, World Heritage Site

Scientific names of primary species being studied:

Tree Scalesia (*Scalesia pedunculata*), passionfruit (*Passiflora edulis*), grasses (*Pennisetum purpureum*, *Panicum maximum* and *Melinis minutiflorus*) blackberry (*Rubus niveus*), sauco (*Cestrum auriculatum*), Cuban cedar (*Cedrela odorata*), quinine (*Cinchona pubescens*), guava (*Psidium guajava*)

Key Research Objectives:

- Determine the distribution and abundance of invasive plant species in the study area by detailed mapping
- Determine the effectiveness of the control of invasive species by repeated measuring of the type and number of invasive plants found in the study area, their location and the type of control treatment they receive
- Determine the patterns of regeneration of native plants (species composition and abundance of seedlings)
- Monitor the growth rate of selected native and introduced plants under canopy cover and in gaps

Date this report was completed: March 2006

Data Collection and Results

a) Give a concise account of the data you have collected during the past field season.

The location and number of weeds has been mapped and later the number killed has been documented over 25 ha. (out of a total of 40 ha initially planned) Permanent quadrates over the whole area and beneath certain invasive species (with and without control) were monitored.

b) What progress have you made towards achieving your original objectives?

- Distribution and abundance of invasive plants species at Los Gemelos is known
- Monitoring of vegetation structure before control has been accomplished

- Permanent quadrates are established

c) Please provide a summary of your results.

The area occupied by invasive plant species was estimated; passionfruit (*Passiflora edulis*), grasses (*Pennisetum purpureum*, *Panicum maximum* and *Melinis minutiflorus*) and blackberry (*Rubus niveus*) were the most abundant species occupying 2.3 ha, 2.2 ha and 1.4 ha respectively. In the 25 ha area the most common invasive trees were: sauco (*Cestrum auriculatum*) with 4915 stems (mean 196/ha); Cuban cedar (*Cedrela odorata*) trees with 749 stems (mean 30/ha); quinine (*Cinchona pubescens*) with 555 stems (mean 22/ha) and; guava (*Psidium guajava*) with 283 stems (mean 11/ha).

Surprising levels of invasion was found in the apparently pristine site.

Control of invasive plants has been done in approximately 8 ha. The table below shows the number of individuals controlled for each species:

Species	Individuals controlled	
	Manual	Chemical
Sauco	8012	4317
Cuban cedar	1	147
Quinine	34	490
Passion fruit		232
Guava		24

Significance/Benefits of Research

a) What is/are the significance/benefits of your research at the following levels?

- Local:
Restoration of an important remnant forest on Santa Cruz. The Earthwatch project may become a model for other conservation projects on Galapagos.
- National:
Training and employment for Ecuadorian biologist Jorge Renteria, good jobs for local biologists are hard to find. Capacity building for the Darwin Research Station.
- International:
Through publication of research this study may make a case for more conservation research of endangered forest types that are based on volunteer contributions

b) How do your findings contribute to issues of sustainability?

- The findings from this study may be applicable to the sustainable management of endangered forest types in other parts of the world.

Dissemination of Results

a) Have you provided details of results from your research to or within:

- Scientific papers (indicate status; e.g., peer reviewed or in progress/press)
 - J. Renteria and C. Buddenhagen (Invasive plants in the *Scalesia pedunculata* forest at Los Gemelos, Santa Cruz, Galapagos for Galapagos Research is under peer-review.)

- Management plans and reports (in progress or completed)
 - The proposal document is a management plan for the site used by the Charles Darwin Research Station and Galapagos National Park Service.
- Presentations (given or planned)
 - None.
- Popular articles or films (in progress or completed)
 - France 3 Television - Aired in January of 2006. To celebrate UNESCO's 60th anniversary, France 3 produced a series on three World Heritage Sites (two cultural and one natural) with Galapagos being the natural site.
- Books, chapters, illustrations
 - None.

Maps of the invasive species distribution are attached. These maps are based on the volunteer data collection.