

Vegetation Change & Planning Restoration in Galapagos

Charles Darwin Foundation

Project



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The Galapagos Archipelago is a very special place; it has many unique and wonderful endemic species and since Charles Darwin's visit in 1835 it has been important in the study of evolution. Galapagos has been protected as a National Park since 1959 and its biodiversity is largely intact. Unfortunately this no longer applies to the highland areas of the four inhabited islands, which are now seriously degraded from human occupation and species invasions. Further changes associated with global climate change are expected in the future. The Charles Darwin Foundation approached Planet Action for tools to help plan important restoration and conservation activities.

Planet Action Support

Due to the relatively recent human colonization, Galapagos has retained most of its original pre-human diversity of species, but unfortunately there have also been many environmental impacts. Invasions by introduced species are recognized as the largest threats to the terrestrial biodiversity.

Existing vegetation mapping of Galapagos is insufficient for an understanding of the current status of ecological communities in the highlands of the inhabited islands. Satellite imagery and software provided by Planet Action is being used to develop new, up-to-date, fine-scale, restoration-focussed vegetation maps.

Project Stakeholders

Galapagos is a World Heritage Area for its outstanding natural beauty, so the global community benefits from the protection of Galapagos ecosystems. Thousands of tourists flock to Galapagos each year to see the incredible biodiversity of the archipelago. The local population depends on this tourism, but also depends on the productive highland area for agricultural products and associated income. The Charles Darwin Foundation is working with the Galapagos National Park Service to effectively plan restoration activities that will best protect remaining biodiversity and effectively restore landscape functioning in Galapagos.





Project Challenges

While several invasive plant species have already spread extensively through native habitats in Galapagos, there is not enough information about how current plant invasions are impacting on overall ecosystem functionality. One of the challenges in the vegetation mapping is to identify differences in ecological condition within the major vegetation classes.

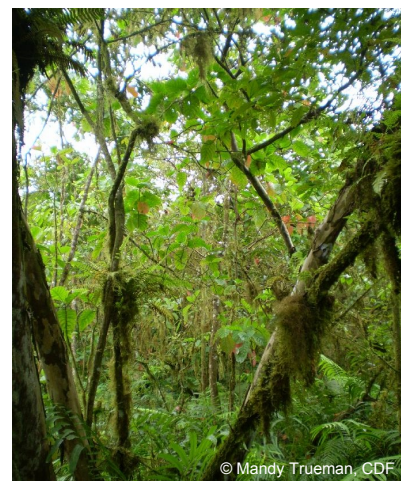
Global climate change is expected to influence the local climate of Galapagos, but for the highlands it is unclear what might happen to the humid conditions caused by the stratus cloud layer present throughout the cool season.



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Use of Satellite Imagery and Software

SPOT imagery is being used with ENVI software to map vegetation on five islands where invasive plants have spread widely: Santa Cruz, Floreana, Isabela, San Cristobal, and Santiago. This will be one of the most important inputs to a spatial model for prioritizing restoration, to be developed using ArcMap software. Historical satellite imagery will also be analysed to elucidate past changes in the cool-season stratus cloud layer and vegetation indices



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Methods and Actions

CDF has an education center in Santa Cruz island to raise awareness of the local population about the threats of introduced plants, such as the blackberry or the guava. Also, several field trips have been conducted to the highlands of Santa Cruz, as part of planning for vegetation field work and weather station installations.

Furthermore, a field trip to Floreana island was also carried out in May 2010. GPS points and tracks were recorded and some preliminary study of vegetation. These observations are helpful for the classification of imagery. Also, seven weather stations were set up and preliminary data from these demonstrate a strong gradient in humidity from the dry lowlands to the wetter highlands.



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SPOT satellite imagery donated by Planet Action gives an excellent representation of the ecological communities present in the degraded highland areas, far superior to prior vegetation mapping. This is invaluable for restoration planning.

Planet Action

5, rue des Satellites - BP 14359 - 31030 Toulouse cedex 4 - France
Phone : +33 (0)5 62 19 40 40 - Fax : +33 (0)5 62 19 40 11
www.planet-action.org - contact@planet-action.org

