

# **Restoration Plan for the Firestone Reserve.**

*April 2007.*



**Preamble:**

Under the terms of the Conservation Easement, the Firestone property consists of 5 functional units:

- (a) The lower section, incorporating the Program House, Senior Workers' House, Student Dormitory, and Ecology Center plus associated gardens and landscaping.
- (b) The Access Road
- (c) Building Site A, currently occupied by the Teaching Pavilion.
- (d) Building Site B, not currently in use, but cleared.
- (e) The remainder of the property, hereafter referred to as "the Reserve".

Under the original goals developed for the FCRE, the specified intent is that the Reserve be transitioned from its pre-Pitzer use as a semi-sustainable agricultural operation to a protected biological reserve for research and undergraduate teaching, in which natural forest and associated biodiversity are maximized.

**Specific Objectives Include:****Former Pasture and Grass Areas:**

- (1) Removal of grazing animals from the pasture areas (completed March 2005).
- (2) Eliminating direct cutting of grass areas, with the exception of the two building sites and the area directly seaward of Site A (effective from March 2006).
- (3) Area seaward of Site A to be cut twice annually to preserve the view from the Teaching Pavilion, in accordance with the Donor's wishes.
- (4) Site B to be maintained free of shrubbery, as per the terms of the donation.
- (5) Formal research plots to be established to monitor regeneration (established June 2006 by Dr. Thomson).

**Riparian Zones**

- (6) No direct intervention. Tree falls to be left in place unless blocking trails or deemed a safety hazard

**Abandoned Hardwood Plantations**

(7) The abandoned plantation areas are now ~ 13 years old. A standard dendrological survey to determine species survival, growth, and spatial distribution is necessary. Following this survey, it should be possible to determine if the Abandoned Hardwood Plantation areas are best left without further intervention, or if additional plantings of rare and/or desirable native hardwoods are appropriate.

## **Secondary Forest.**

(8) The largest areas of the Reserve consist of naturally regenerating secondary forest.

This forest is at a very immature stage, in comparison to the Abandoned Hardwood Plantation forest. Direct intervention through the planting of desirable native hardwood species is appropriate. A formal plan, in which the secondary forest would be subdivided into several zones, should be developed. These zones should include:

- (i) A zone for student-initiated planting efforts.
- (ii) A zone for formal, experimental plantation efforts that specifically explore tree survival, planting density, and other parameters.
- (iii) A control zone left to natural regeneration.

## **Bamboo Plantation.**

(9) The bamboo plantations consist of one area of *Dendrocalamus* and a larger area of *Guadua*. The *Dendrocalamus* has some modest commercial value, whereas we have not been able to identify a market for the *Guadua*. Both species are non-native. The long term goal is to substantially reduce the total area under bamboo and replace it with native hardwood forest. However, several considerations apply:

- (i) In the short to medium term (10 years, 2007 – 2017) the *Dendrocalamus* should continue to be maintained and harvested in a sustainable fashion, as a minor source of income for the FCRE operations.
- (ii) Designated areas of dense *Guadua* growth shall be cut and used as experimental plots to determine an appropriate strategy to achieve the desired bamboo-hardwood transition. The first of these plots was established in 2006.
- (iii) Most of the archaeological resources of the Reserve are located in bamboo areas. Consideration of rock-art conservation should be used to determine whether small areas of bamboo should be retained or replaced.
- (iv) Mapping and marking of the limits of the *Guadua* areas should be undertaken to determine whether the bamboo is spreading. Appropriate measures to restrain bamboo spread should be implemented as needed.

## **Banana Plantation.**

(10) The banana plantation serves as a useful food resource for animals moving between the Hacienda Baru and Firestone Reserve. The plantation should be preserved, at least for the 10 year span of this Plan, but not actively maintained. Consideration should be given to using the banana plantation as a site for planting of individual demonstration specimens of tropical agricultural interest, if warranted by educational needs.

## **Ponds.**

- (11) There are 5 artificial ponds on the property, all but the Fish Pond located within the Reserve area. These have proven useful for promoting biodiversity, and should be retained. The largest pond, “Duck Pond” warrants active planting of native trees and shrubs around its periphery.

## **Procedure.**

It is of utmost importance that planting in the Reserve does not proceed in an unregulated fashion. Therefore, it is reserve policy that:

- (a) NOTHING be planted in any part of the Reserve area without the express knowledge and prior approval of the Faculty Advisory Committee.
- (b) EVERY specimen planted in the Reserve shall be entered into a uniform database.
- (c) NOTHING shall be cut/harvested in the Reserve without prior approval from the Faculty Advisory Committee. Students and visitors may harvest small numbers of coconuts from trees along the access road, provided care is taken to avoid damage to the trees or their surroundings.