RESTORATION INITIATIVES IN THE LOWLAND TROPICS OF CENTRAL AMERICA

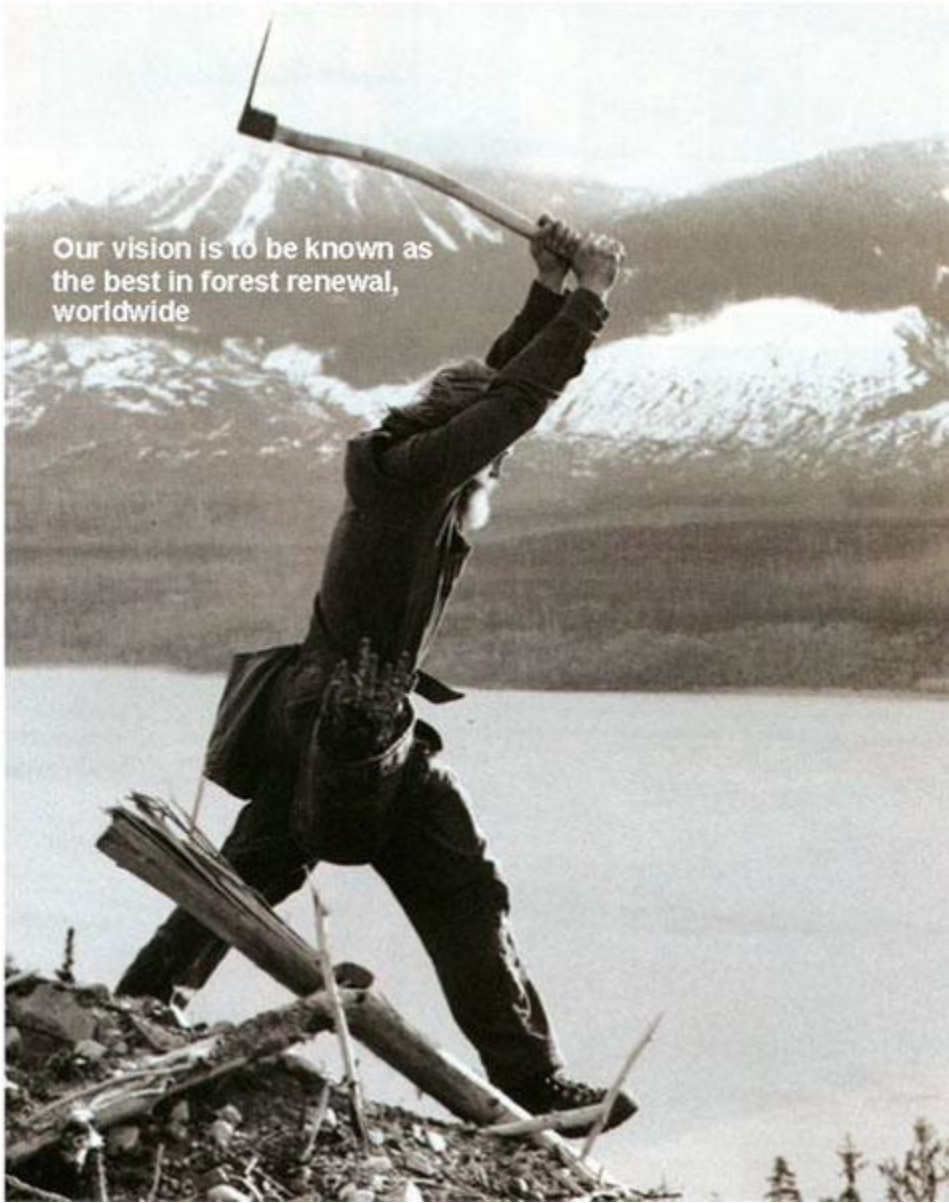
Ricardo Luján
ricardo_lujan@brinkman.ca
BARCA
Brinkman y Asociados Reforestadores de Centro América

Yale Chapter of the International Society of Tropical Foresters.
January 26-28 , 2012

BARCA

Background

BARCA started operations in Central America in 1994 and is a subsidiary of BRINKMAN & ASSOCIATES working in Canada since 1970s.



Our main activity is reforestation. In 2010 we celebrated the planting of 1 billion trees (1970-2010).

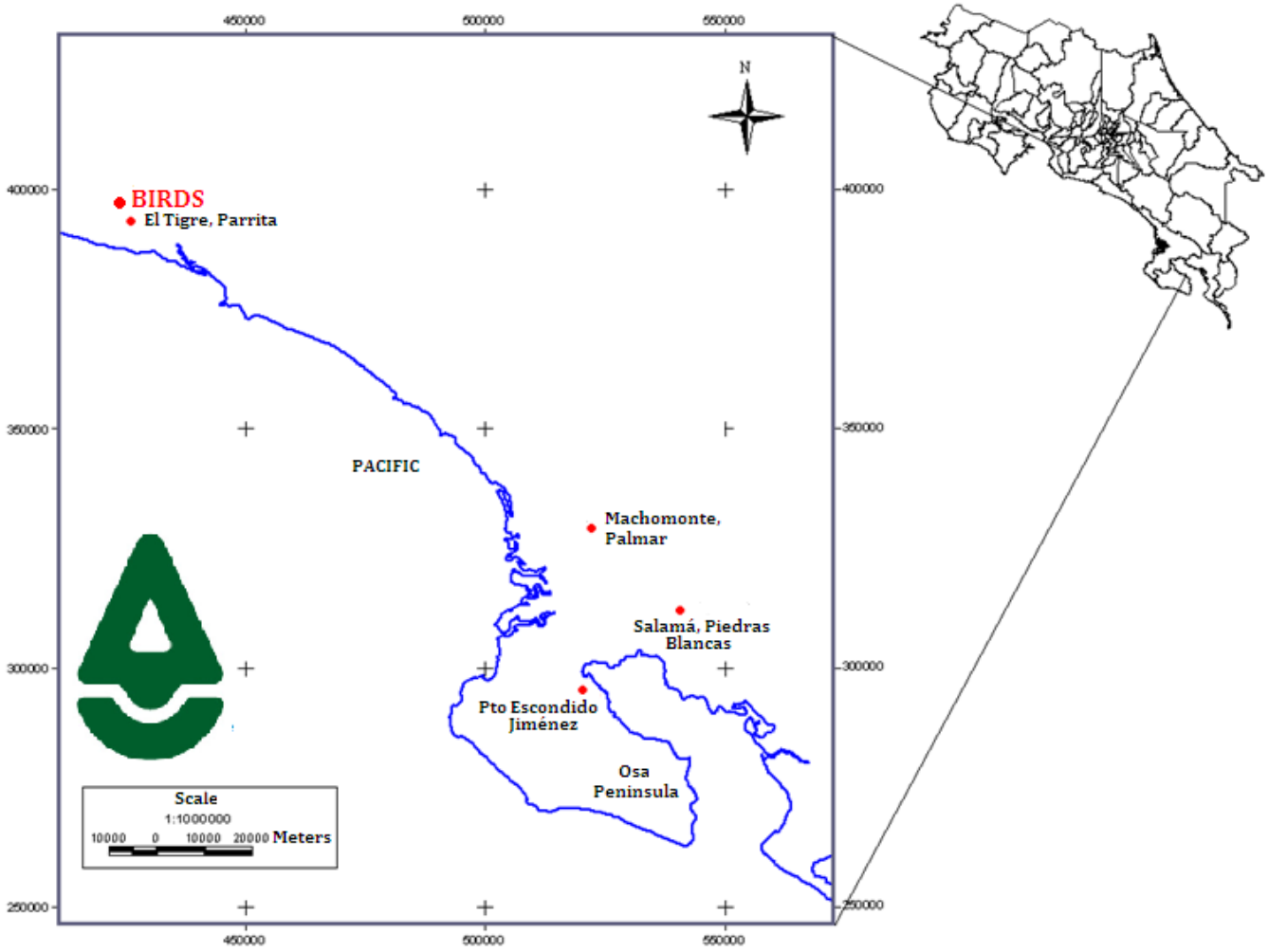
Other work:

- Silviculture contracting services,
- Restoring urban landscapes,
- Agroforestry (mainly cacao),
- Forest management for indigenous landowners,
- Ecosystem restoration .

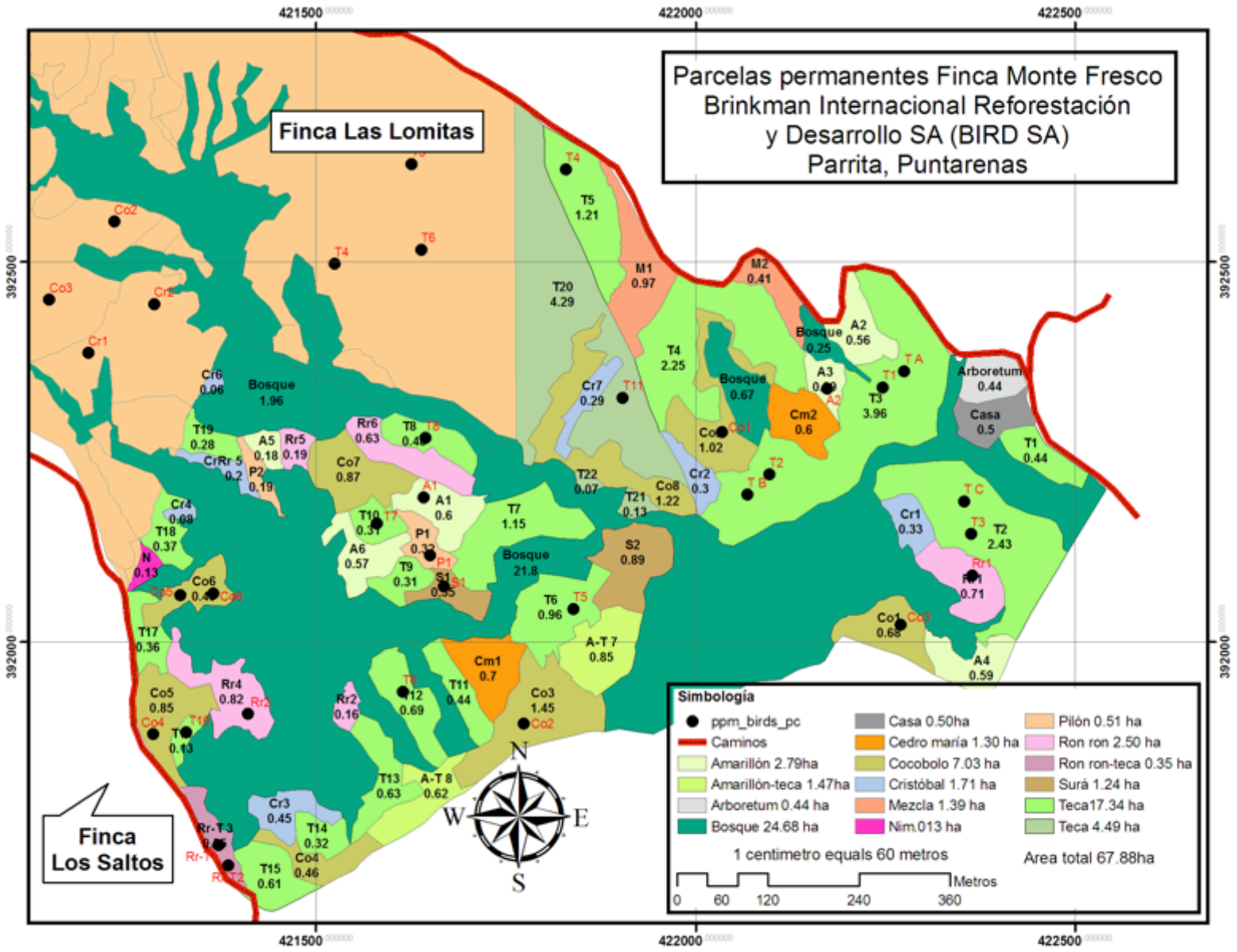
RESTORATION PROJECTS MANAGED BY BARCA

- The BIRD Projects, Central Pacific of Costa Rica.
- From reforestation to restoration, Osa Peninsula, Costa Rica.
- Restoration as a “Social Responsability” Project, Darien, Panamá (Kuna-Madugandí).

THE BIRD PROJECTS



BIRD Farm Map with Location of Permanent Sampling



Species Planted in the BIRDs Projects

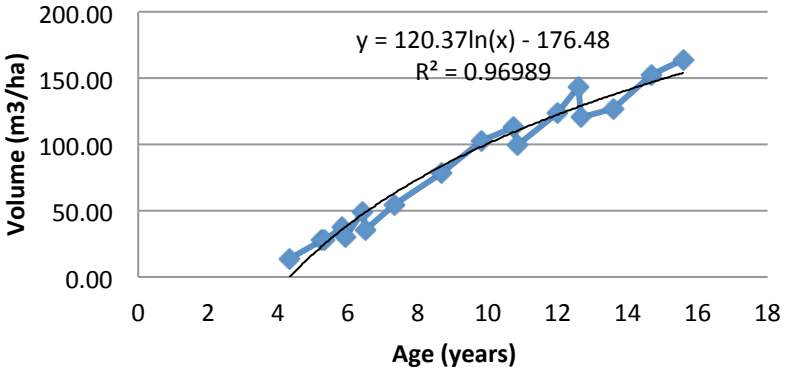
Common Name	Scientific Name
Teca (Teak)	Tectona grandis
Amarillón	Terminalia amazonia
Cocobolo (Rose Wood)	Dalbergia retusa
Cristobal	Platymiscium pinnatum (curuense)
Cristobal/Cachimbo (Trebol)	Platymiscium parviflorum
Ron ron (Tiger Wood)	Astronium graveolens
Pilón/Zapatero	Hieronyma alchorneoides
Cedro maria	Calophyllum brasiliense
Surá	Terminalia oblonga
Cedro(Spanish Ceder)	Cedrela mexicana
Caoba (Mahogany)	Swietenia marcophylla
Neem	Azadirachta indica
Cenizaro	Samanea saman (Phitecelobium saman)

BIRD Corner (Co1-A4 “Frijol Area”): RoseWood; PurpleHeart; Cristobal; Amarillon.

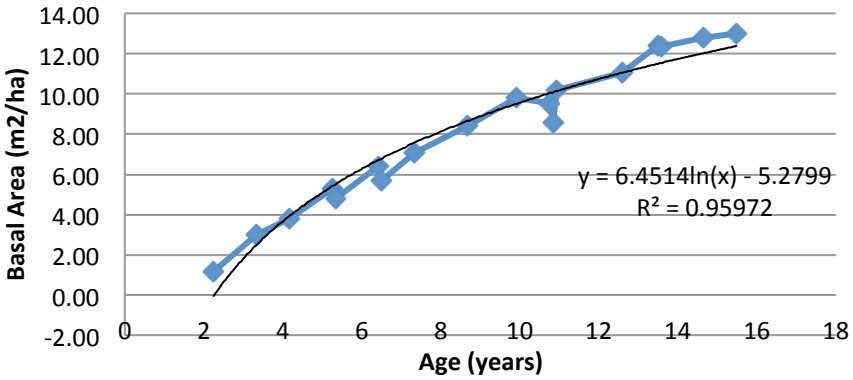
BIRD Farm Border

Understory: *Brosimum; Virola; Tabebuia; Platimiscium; Inga;…*

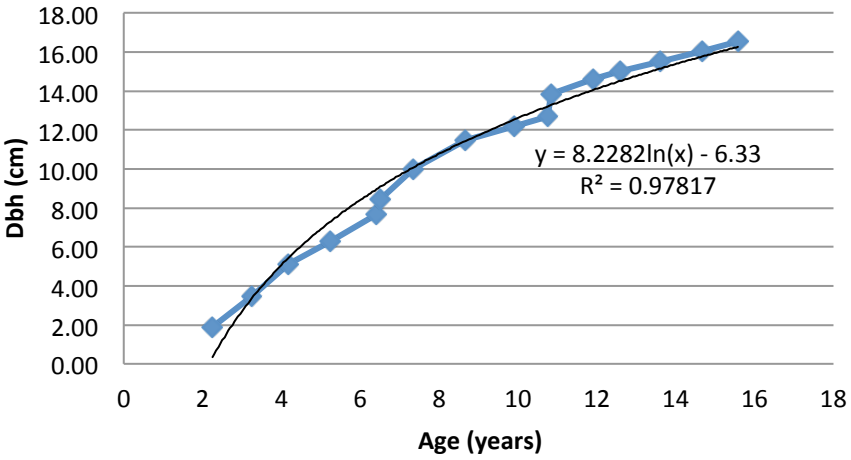
Terminalia amazonia Vol. Growth



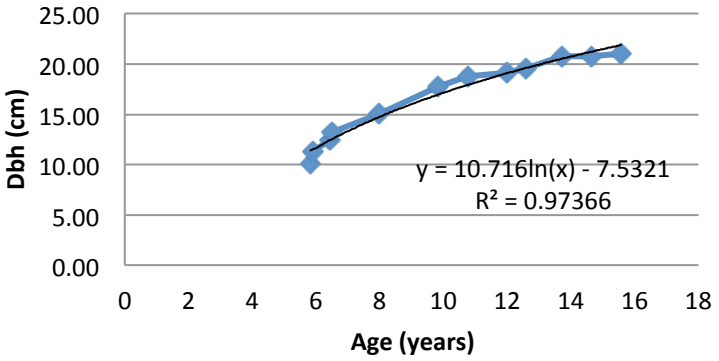
Basal Area Growth for Rose Wood



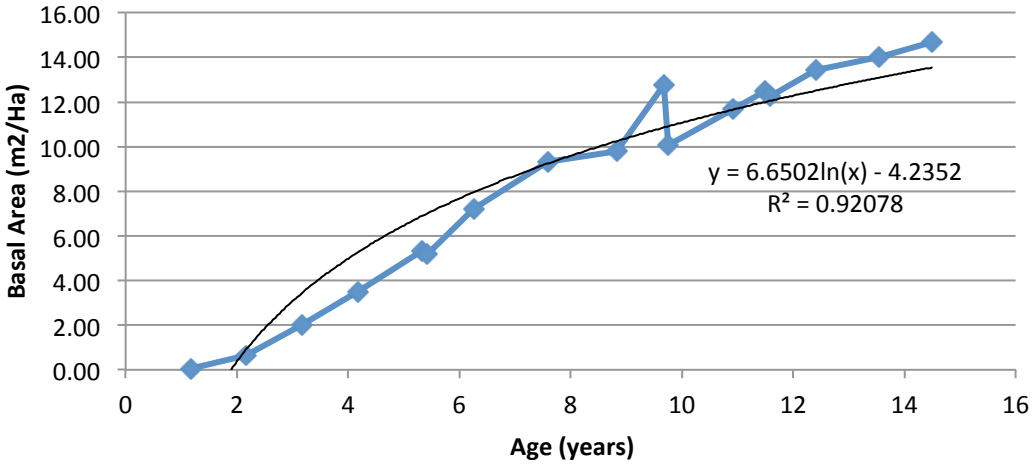
Astronium graveolens Dbh Growth



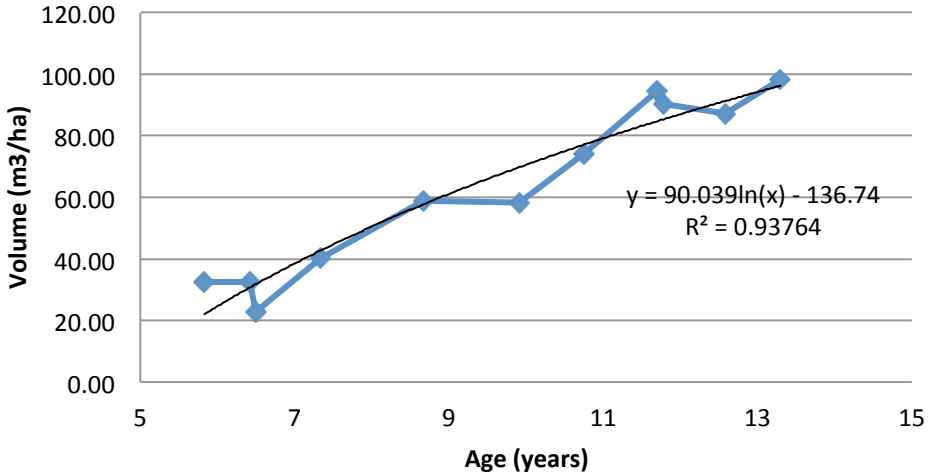
Hieronyma alchorneoides Dbh Growth



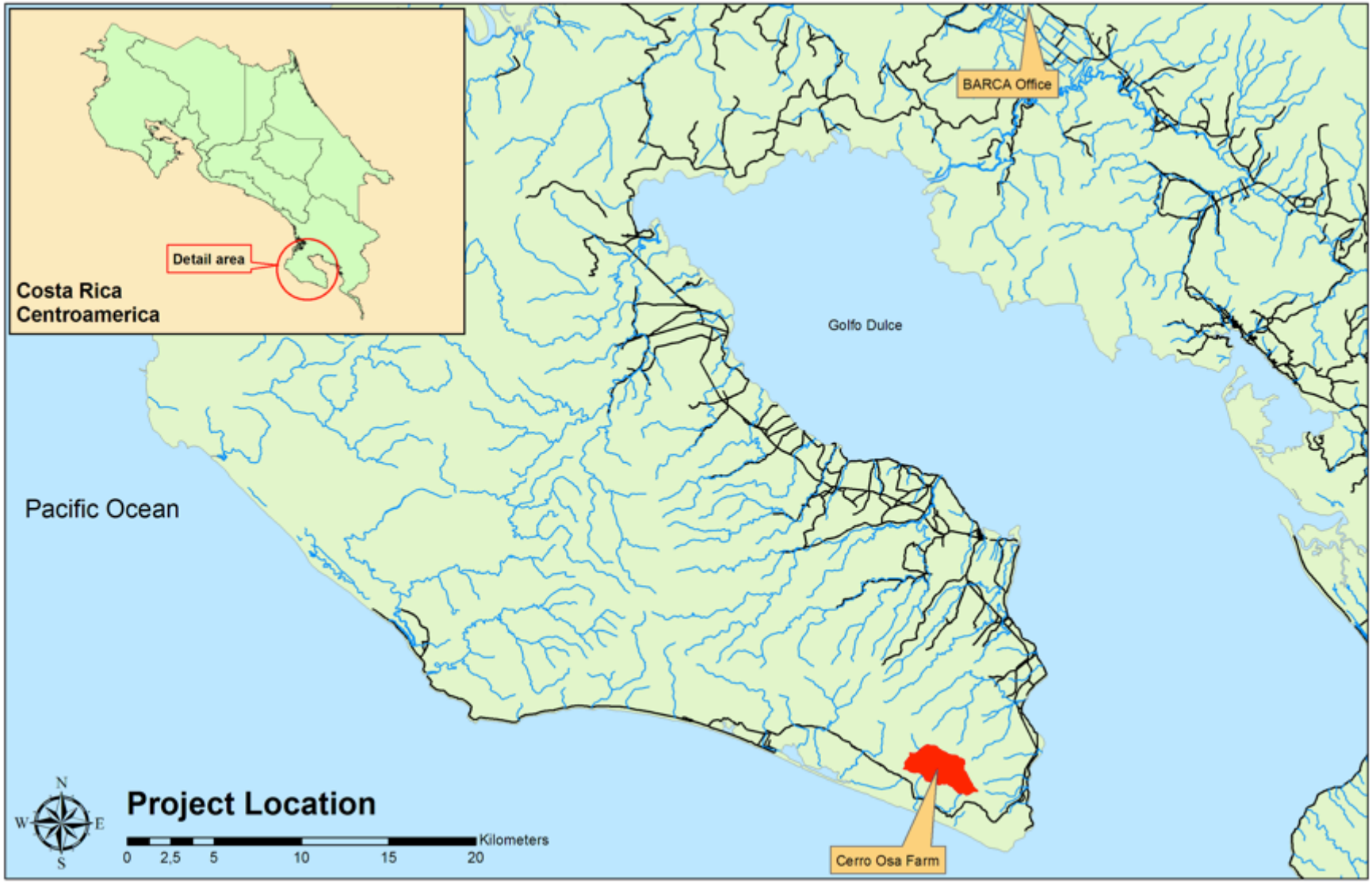
Platymiscium pinnatum Basal Area Growth



Terminalia oblonga Vol. Growth



NGO Friends of Osa/BARCA Restoration Initiatives

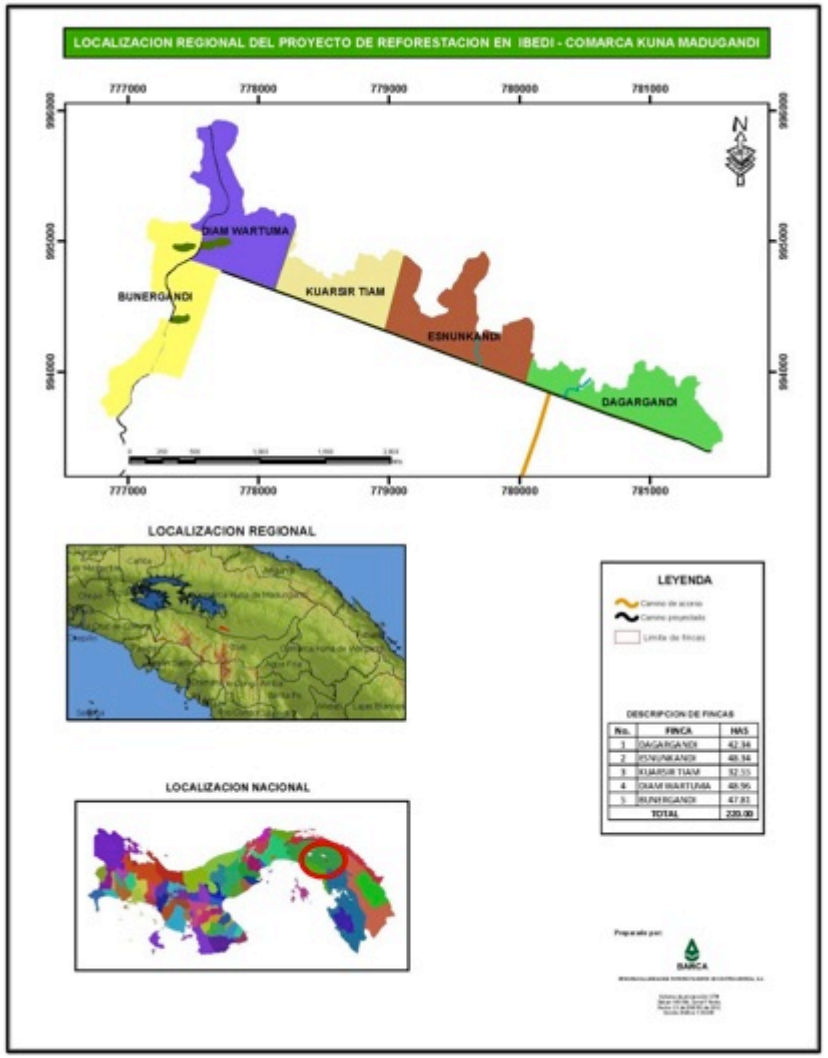


“Enrichment Planting”
Friends of Osa/BARCA 2010

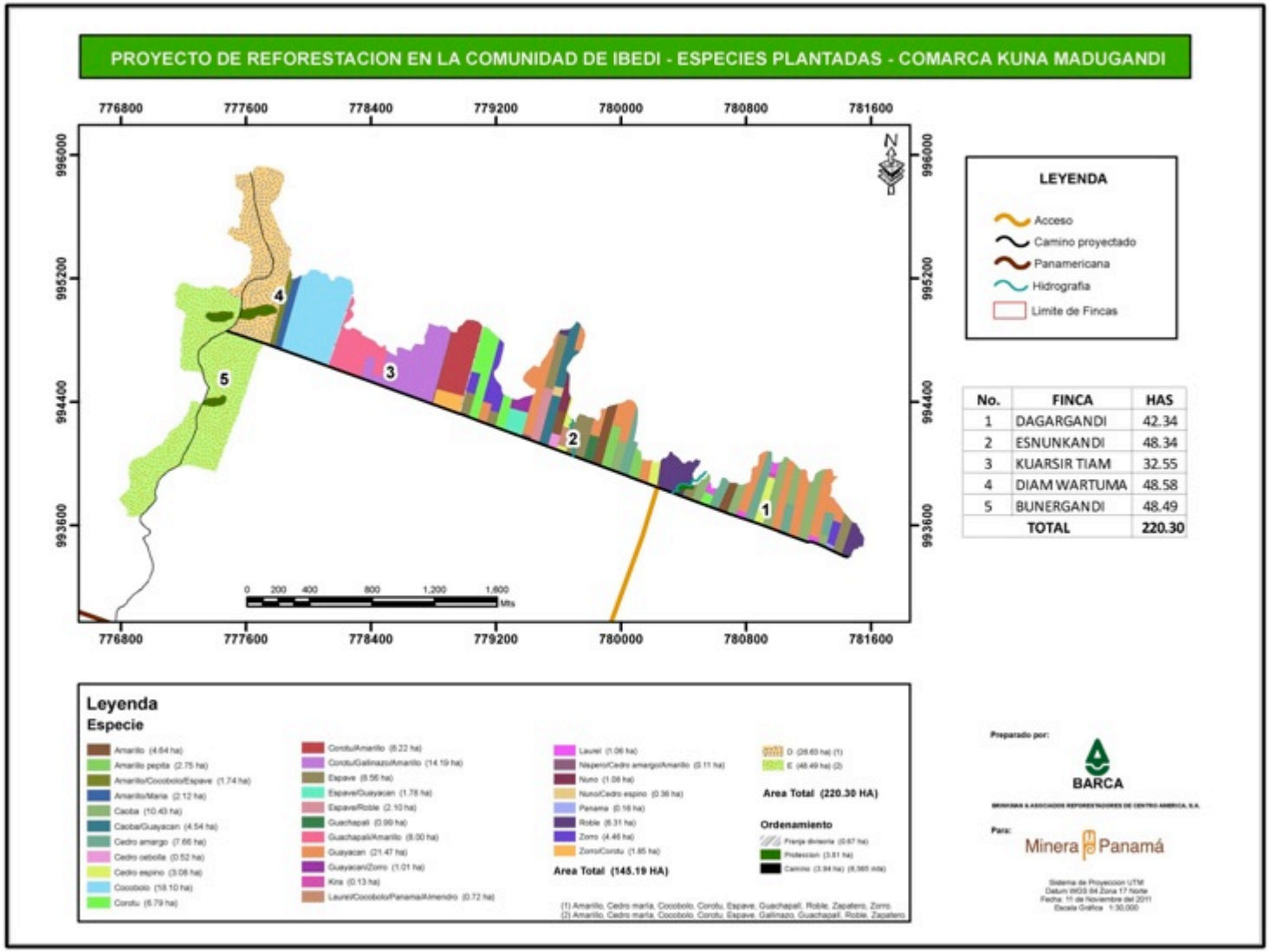
Common Name	Scientific Name	Number of Planted Trees
LORITO	Cojoba arborea	1600
PILON	Hyeronima alchorneoides	3000
MANGLILLO	Aspidosperma grandiflorum	2400
CRISTOBAL	Platymiscium pinnatum	3000
TOTAL		10 000

The objetive of this planting was to enhance the biodiversity of existing pure reforestation stands (pochote, teak, amarillón). New areas of the corridor have *Gmelina arborea* pure stands, and the goal is to substitute them with mixed native species stands.

Restoration in the **Comarca Kuna de Madugandí** (autonomous indigenous territory)



Detail of the “Mosaic Planting” with native forest species in the Kuna-Madugnadí Comarca



Planted Species Kuna-Madugandí Restoration ("Social Responsability") Project

N°	Common Name ("Panamenian")	Scientific name	# Planted Trees
1	Amarillo pepita	Lafoensia punicifolia	3,000
2	Cedro Amargo	Cedrela odorata	2,400
3	Cedro espino	Bombacopsis quinata	3,048
4	Roble	Tabebuia rosea	10,900
5	Almendro	Dipterix panamensis	8,075
6	Níspero	Manilkara Achras	240
7	Gallinazo o Tinecu	Schizolobium parahybum	21,000
8	Zorro	Astronium graveolens	8,800
9	Cocobolo	Dalbergia retusa	35,100
10	Caoba	Swietenia macrophylla	8,800
11	Guachapalí	Samanea saman	11,060
12	Guayacán	Tabebuia guayacan	20,900
13	Maria	Calophyllum brasilensis	2,500
14	Corotu	Enterolobium cyclocarpum	20,440
15	Quira	Platymiscium pinnatum	200
16	Laurel	Cordia alliodora	3,060
17	Panama	Sterculia apetala	200
18	Zapatero	Hieronyma alchorneoides	20,000
20	Amarillo guayaquil	Centrolobium yavizanum	100
21	Amarillo	Terminalia amazonia	64,000
22	Espavé	Anacardium excelsum	14,196
TOTALES			258,019


Saccharum spontaneum


"Colonos"
REGIDURIA DE POLICIA


PROYECTO IBEDI
COMARCA KUNA
DE MADUGANDI
REFORESTACION DE
220 HECTAREAS,
CON ESPECIES NATIVAS

The Comarca People need to:

Protect their territory against “colono” invasions,

Produce food, medicine and ornamentals,

Produce construction materials (roofing, wooden boards and round logs, fuel for cooking)

Non-timber products:
"Guagara" (*Sabal allenii*) for roofing.

“Polycyclic Management”

Natural regeneration of trees found in project area

Common Name	Scientific Name	Family
Jobo	Spondias mombin	Anacardiaceae
Chirimoya	Annona pittieri	Annonaceae
Palma Guagara	Sabal allieni	Palmaceae
Balo	Gliricidia sepium	Papilionaceae
Bongo	Ceiba pentandra	Bombacaceae
Espavé	Anacardium excelsum	Anacardiaceae
Periquillo	Muntingia calabura	Malvaceae
Higuerón	Ficus sp	Moraceae
Tachuelo, Alcabú	Zanhtoxylum setulosum	Rutaceae
Guarumo	Cecropia peltata	Urticaceae
Jobo lagarto	Sciadodendron excelsum	Araliaceae
Membrillo	Gustavia superba	Lecythidaceae
Cuipo	Cabanillesia pyramidale	Bombacaceae
Coco Olla de mono	Lecythis sp	Lecythidaceae

Initial proposed thinning regime of planted trees

Thinnings	Age of Plantation (years)	Thinning Intensity %	No. of thinned trees per ha.
1º (First)	5-7	45 -50	500 -600
2º (Second)	10-12	25 -30	150 -155
3º (Third)	14 -16	25 -30	110 -115
4º (Fourth)	18 -20	20 -25	60 -70
5° (Fifth)	25 -27	20 -25	50 -55
6° (Sixth)	30 - 33	20 -25	40 -45
Final Cut of Original planted trees	35	100	170 -180

Key Aspects for Restoration:

- Best available genetic stock for reproduction,
- Good Site and Micro-site/Species Correlations, and knowledge of forest species, tolerances.
- Excellent Management (silviculture and human resources)
- Incorporation of non-timber species/products,
- Work at grass-roots level, understanding local laws and traditions,
- Search for “buffer zones”, communal areas, if possible incorporate “environmental service payments” concepts
- Understand and work with natural regeneration.

Select “Plus Trees”

15 year old *Astronium graveolens*. BIRD Farm

15 years old *Platymiscium pinnatum,* Bird Farms

***P. pinnatum* 15 cm dbh**

***P. Pinnatum* 22 cm dbh**

15 years old *Platymiscium pinnatum*, dhb > 30 cm, Bird Farm.

Phenotype Selection:

a) Associated to Volume (less heredability)
b) Associated to Quality (greater heredability)

Circular Plots (10 to 20 m radius) and select best, 4-8 trees around the “plus potential one”.

Superior Tree (%)=((plus tree – neighbor tree)÷(neighbor tree))*100


Hieronyma alchorneoides "plus tree colection"

Site/Species Selection

Greater range of sites:

- *Tabebuia rosea, Terminalia amazonia, Vochysia* (acid soils)…

Wetter Areas:

- *Anacardium excelsum, Pterocarpus officinalis*,…

Benefits with some shade:

- *Platymiscium pinnatum, Calophyllum brasiliense*…

Drier shallower soils:

- *Dalbergia retusa, Byrsonima crassifolia…*

Below Canopy:

- *Minquartia guianensis, Pouteria sp, Bromsimum sp*,…

Soil and Soil History

Inceptisols

Ultisols

Also will greatly affect natural regeneration along with closeness to forests or forest patches.

Management and Human Resources

The Rainforest Alliance

BRINKMAN & ASOCIADOS REFORESTADORES DE CENTRO AMÉRICA, S.A. (BARCA, S.A.)
APARTADO 46-60502, PALMAR NORTE DE OSA, PUNTARENAS, COSTA RICA

IS CERTIFIED FOR FOREST STEWARDSHIP COUNCIL FOREST MANAGEMENT AND CHAIN-OF-CUSTODY

Certificate Scope

Certificate Type: Group Forest Management and Chain-of-Custody
Standard(s): Rainforest Alliance/SmartWood Interim Standard for Costa Rica, November 2008, Version Number 11-08
Product group(s): Logs
Valid from July 5, 2011 to July 4, 2016
Certificate Registration Code: SW-FM/COC-000152
FSC License Code: FSC-C021353
Certificate Issue Number: IN-2011-1

As a group certificate, the activities and products included in the scope of this certificate are performed by a network of participating group members. Additional details regarding the scope, including a full list of products, species, and participating group members, are available at info.fsc.org.

Jon Jickling, Director
SmartWood Program of the Rainforest Alliance
65 Millet Street, Suite 201, Richmond, Vermont, USA 05477

RAINFOREST ALLIANCE IS AN ACCREDITED FSC CERTIFICATION BODY

The validity of this certificate shall be verified on info.fsc.org. This certificate does not constitute evidence that a particular product supplied by the certificate holder is FSC certified and/or FSC Controlled Wood. Products offered, shipped or sold by the certificate holder can only be considered covered by the scope of this certificate when the required FSC claim is clearly stated on invoices and shipping documents.

This certificate is the property of the SmartWood Program of the Rainforest Alliance. This certificate and all copies or reproductions of this certificate shall be returned or destroyed if requested by SmartWood.

ACCREDITED
FSC-ACC-004

FSC

Systems
Protocols
Crew size
Training
Auditing
Ocup. Health
Fair Wages
Motivation
Know-How

Non-Timber Forest Products

Zamia skinneri

- **Vines and Palms:** for handicrafts (baskets, ornamentas..)
- **Medicinal**s: (*Psychotira ipecacuanha, Smilax*(s), *Quassia amara*..)
- **Ornamentals:** (*Zamia sp., Philodrendron sp., Heliconia sp*...)
- **Food:** (beans, corn, heart of palm, ginger..)
- **Roofs** (guagara..)
- **Fuel**

Community: work at grass-root level

Indigenous traditions and laws
National laws and requirements
Work ethics and group organization
Social/Ecological Restoration Sustainability
Jobs, products,.

Restoration Areas Where?

- Comarca/Indigenous areas
- Communal Areas
- "Protection Areas"
- Government Areas
- Private Sector "social responsability "

"Environmental service payments"

(carbon footprint, water, soil conservation, biodiversity, landscape)

The land use capability, the soil fertility and actual forest cover, along with social or community needs and actual goverment politics, laws, and legal security, will affect the modality and sustainability of the restoration of forests in the tropical countries.


Thank you!