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THE FRAMEWORK SPECIES METHOD

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The Framework Species Method of Forest Restoration

Planting 20-30 **indigenous** forest tree species, which enhance natural forest regeneration and accelerate biodiversity recovery. 3,125 trees/ha = 1.8 m apart.

Nigel Tucker, 1 yr old plot, Queensland, 1996



First conceived in Queensland, Australia, now FORRU-CMU is adapting the method to Thailand and neighbouring countries.

Framework Tree Species: Catalyse Natural Forest Regeneration

Macaranga denticulata

- High survival rates
- Rapid growth rates
- Dense spreading crowns to shade out weeds and “re-capture” the site ... & ...



- Attract seed-dispersing wildlife into planted plots, with fruit, nectar, perching sites etc





Prunus cerasoides burnt 8 months after planting. Original stem died but, 3 months later a new stem sprouted from the root collar.



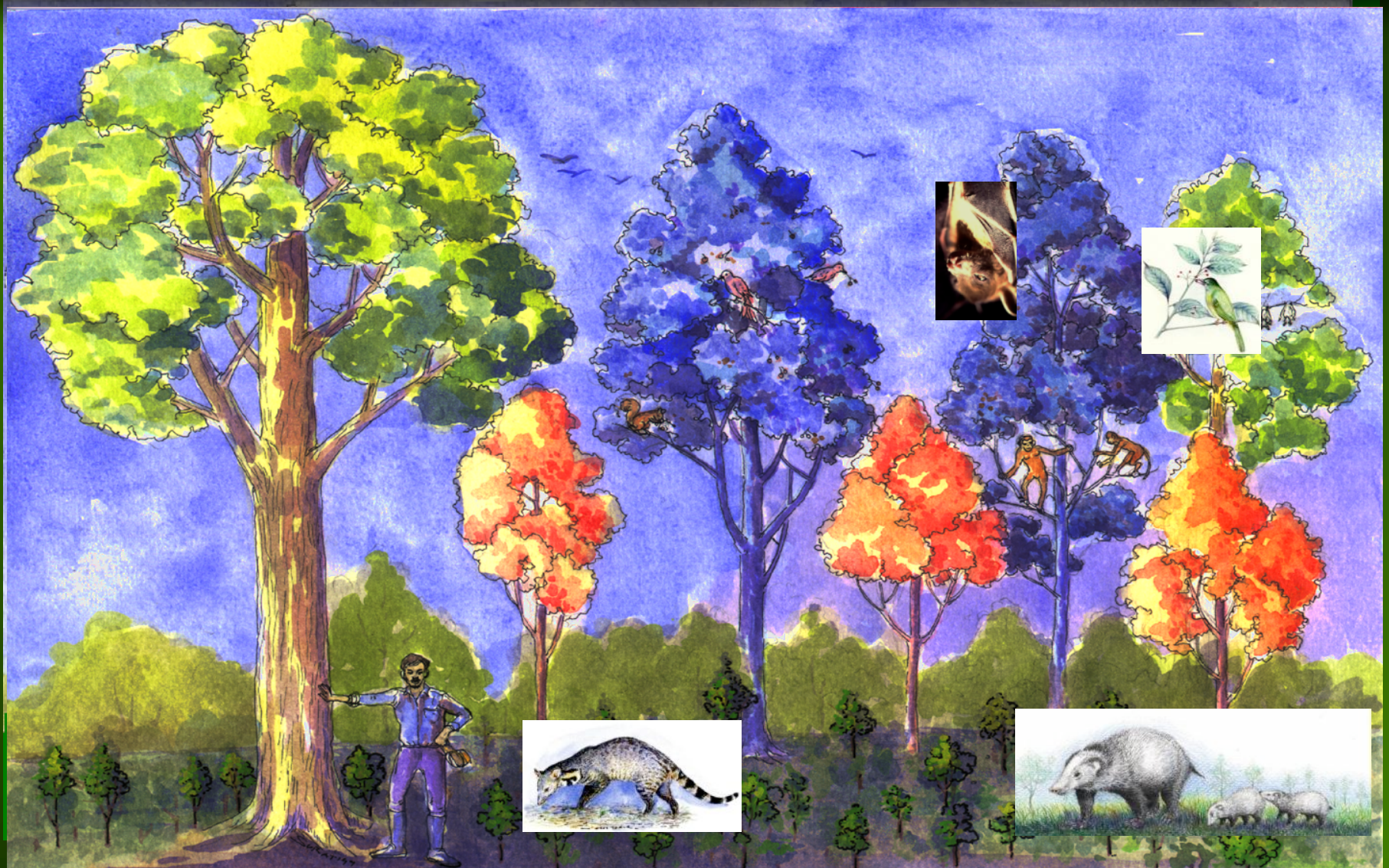
Dead
Original
Stem

New Stem
After Fire

**Easy to
propagate in
nurseries**



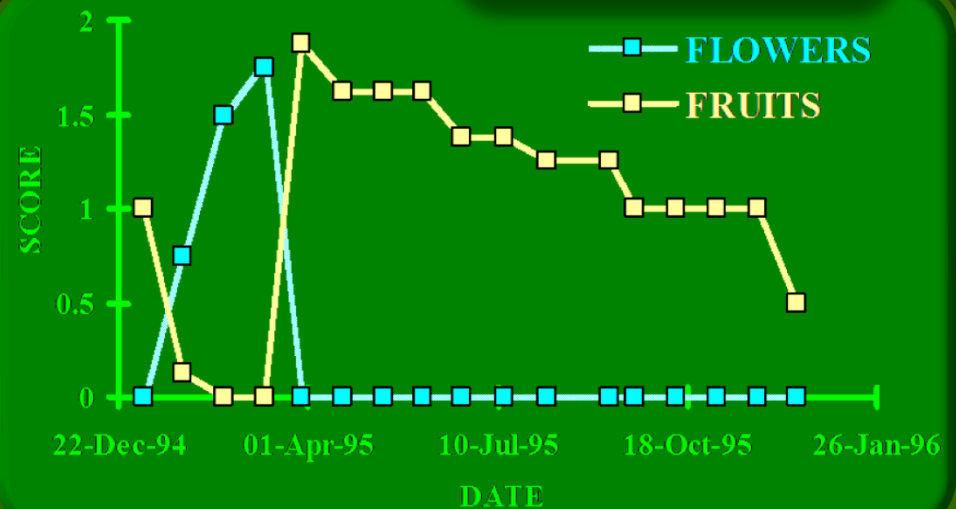
Plant 20-30 pioneer and climax tree species in a single step



Original tree species composition of the forest restored

Research Activities

Natural Forest – phenology trails to study seasonality of seed production



Research on Growing Trees

Seed collection and developing methods to propagate planting stock of candidate framework trees for field trials
- >450 species propagated so far.



Production Schedules – the objective of nursery research

E.g. for *Spondias axillaris*

Rainy Season

Ja Fb Mr Ap My Jn Jl Ag Sp Oc Nv Dc

Seed dispersal

Collect seeds.
Soak and dry.

Store

Sow

Prick out

Grow on

Ja Fb Mr Ap My Jn Jl Ag Sp Oc Nv Dc

Grow on. (Apply
fertilizer)

Harden

Plant

Field Trials – with Ban Mae Sa Mai

Compare performance among tree species

Test silvicultural methods to enhance tree performance



Field Trials - biodiversity recovery

- Attractiveness of trees to wildlife.
- Re-colonization by birds and mammals, particularly seed dispersers.



Community Involvement

- Planning
- Seed collection and growing trees in community tree nursery
- Planting, caring, monitoring trees



**Does it
work?**

8½ YEARS



Provision of Wildlife Resources



Prunus cerasoides, fruiting and bird's nests within 3 years after planting.

Biodiversity Recovery

Within 3 years after planting, mammals begin to return: Pangolin, Hog Badger, Barking Deer, Large Indian Civet and Wild Pigs.



Hog Badger breeds in the plots 3 years old or older.



**Large Indian Civet -
major seed disperser
across fragmented
landscapes over long
distances.**



Aquilaria crassna



Biodiversity Recovery

Bird species in the landscape increased from 30 species (before tree planting) to 87 (6 years after planting).

This represents 63% of the bird community of the nearest natural forest.



Biodiversity Recovery

Planting framework tree species fostered the recruitment of an additional (non-planted) 72 tree species within 8-9 years (Sinhaseni, 2008).

Dipterocarpus costatus



Biodiversity Recovery, N. Thailand, Evergreen Forest Zone, 6 years after planting 29 FW tree species

- Mycorrhizal fungi 6 >> 21 species (higher than natural forest)³
- Lichen species richness double that of natural forest⁴

³Nandakwang, ⁴Phongchiewboon

Identification of Framework Tree Species – upland evergreen forest in N. Thailand

All aged 11 months

Ficus hispida



Spondias axillaris



Acrocarpus fraxinifolius



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Modifying the FWS method to generate more income.

- Most FW Spp already have economic value e.g. *Gmelina arborea* (wood), *Sapindus rarak* (soap) etc.
- More can be mixed in, as needed, but they should be diverse mixtures of native species.
- So **Rainforestation** is an extension of the FWS method, with added economic value.

	RAINFORESTATION	FRAMEWORK SPECIES METHOD
SPECIES DIVERSITY	HIGH	HIGH
USE OF NATIVE SPECIES	YES	YES
NATURAL FOREST STRUCTURE	COMPLEX	COMPLEX
ENVIRONMENTAL PROTECTION	HIGH	HIGH
WILDLIFE CONSERVATION	SLIGHTLY LOWER	HIGHER
ECONOMIC YIELD	HIGHER	LOWER
MOST SUITABLE SITES	FORESTS ON FARMS	PROTECTED AREAS
SPECIES USED	HIGH OVERLAP AMONGST TREE SPECIES USED FOR BOTH	

Genera of Rainforestation trees that also function as FW Spp

- **Trema, Afzelia, Albizia, Melia, Terminalia, Lithocarpus, Castanopsis**