

FOREST RESTORATION EFFORTS IN SINGAPORE

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INTRODUCTION

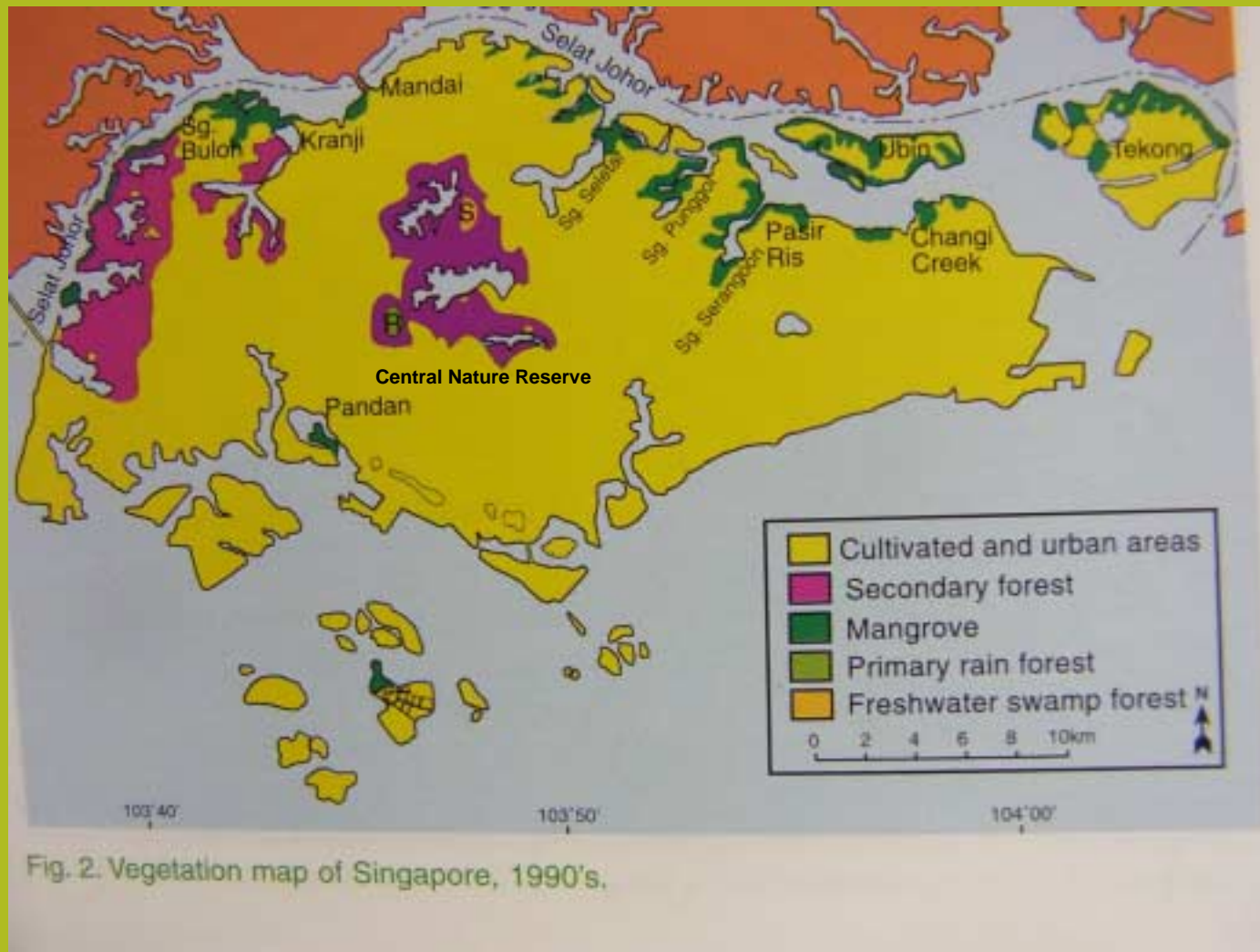


Fig. 2. Vegetation map of Singapore, 1990's.

INTRODUCTION

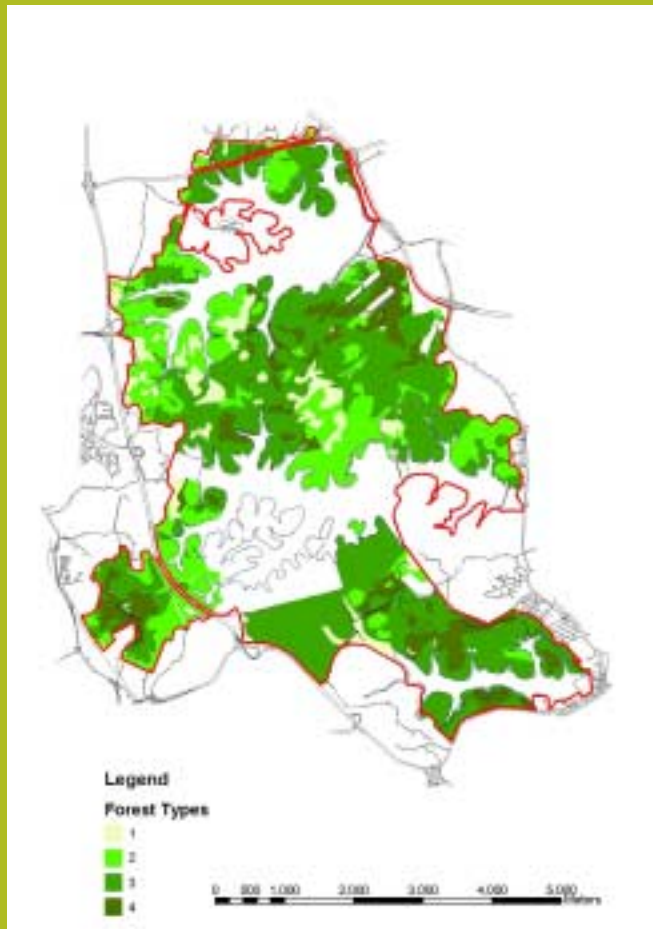


- Reforestation since 1991
- 100 000 trees planted to date
- First reforestation site at Central Nature Reserve

OBJECTIVES

- To restore 'non forest' type vegetation sites back to its former state
- To establish a viable habitat for native flora and fauna
- To establish green connectors and buffer zones

SITE ASSESSMENT



Forest Types in Bukit Timah Nature Reserve and Central Catchment Nature Reserve

- Determine habitat type
- Carry out a baseline survey to identify tree species in and surrounding the site. Size and maturity of both exotic and native tree species are noted
- Identify factors impeding natural regeneration

WEEDS



Resam Patch

- Site dominance by aggressive weeds impede natural succession and regeneration of forest
- Success of the reforestation is largely dependent on initial clearance of weed and management of weed from re-establishing



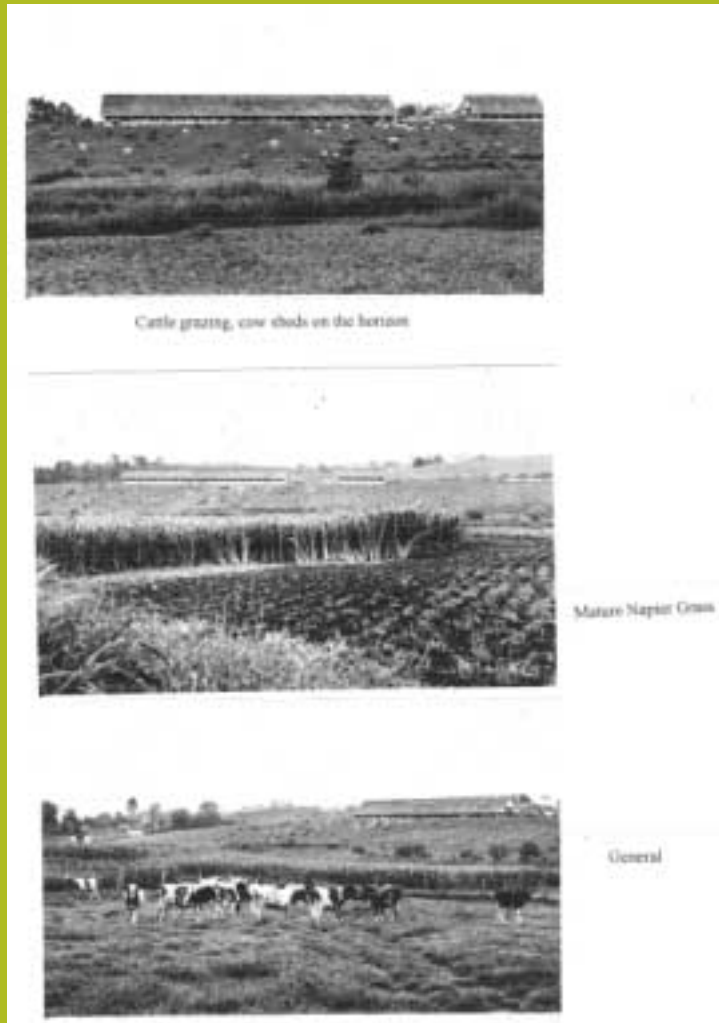
Smilax species



Hevea brasiliensis (Rubber)

SOIL CONDITION

- Past land use activity eg quarrying, farming, grazing and fire affect the soil's natural characteristics and soil fertility



Past agriculture activities – poor soil

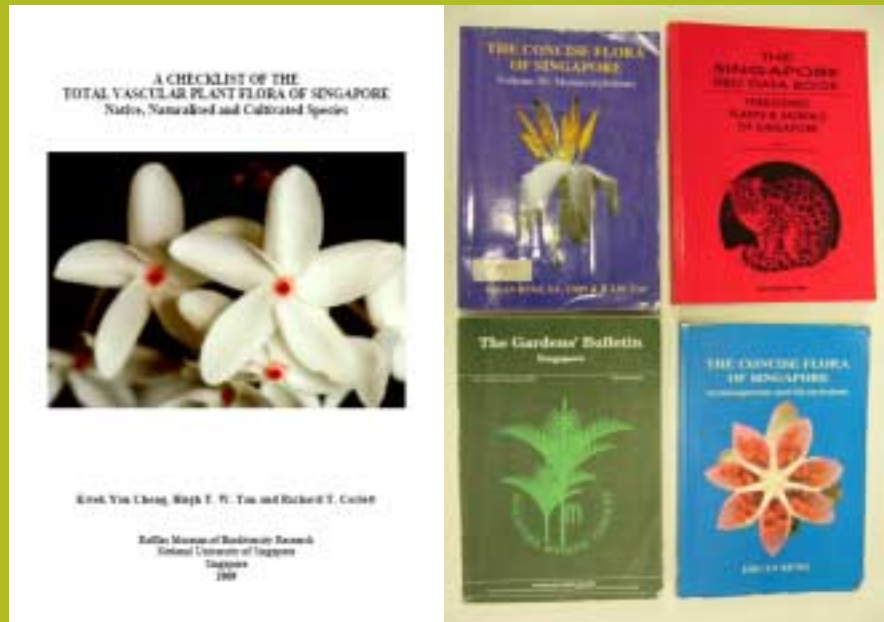


Forest soil profile

METHODS

- **Maximum diversity method (90%)**
 - Planting as many possible species of primary and mature secondary forest species
- **“Framework” method (9%)**
 - Planting of native species under established “framework” of non native species (eg ex-rubber plantation, *Paraserianthes facaltaria*)
- **Natural regeneration method(1%)**
 - Requires the removal of the dominating weed without planting

TREE SPECIES SELECTION



- Native tree guide / reference book to identify correct tree species and the knowledge of suitable trees species for specific site
- Source (Local/Malaysia) of saplings

GROUND PREPARATION



- Remove thick mat formed by Resam
- Cut and remove underground stem thoroughly for Smilax climber
- Retain strips of vegetation to large-scale open clearing of vegetation on slopes to minimise soil erosion
- Keep fallen tree logs and existing desirable tree species to attract wild life

PLANTING



Maximum diversity method



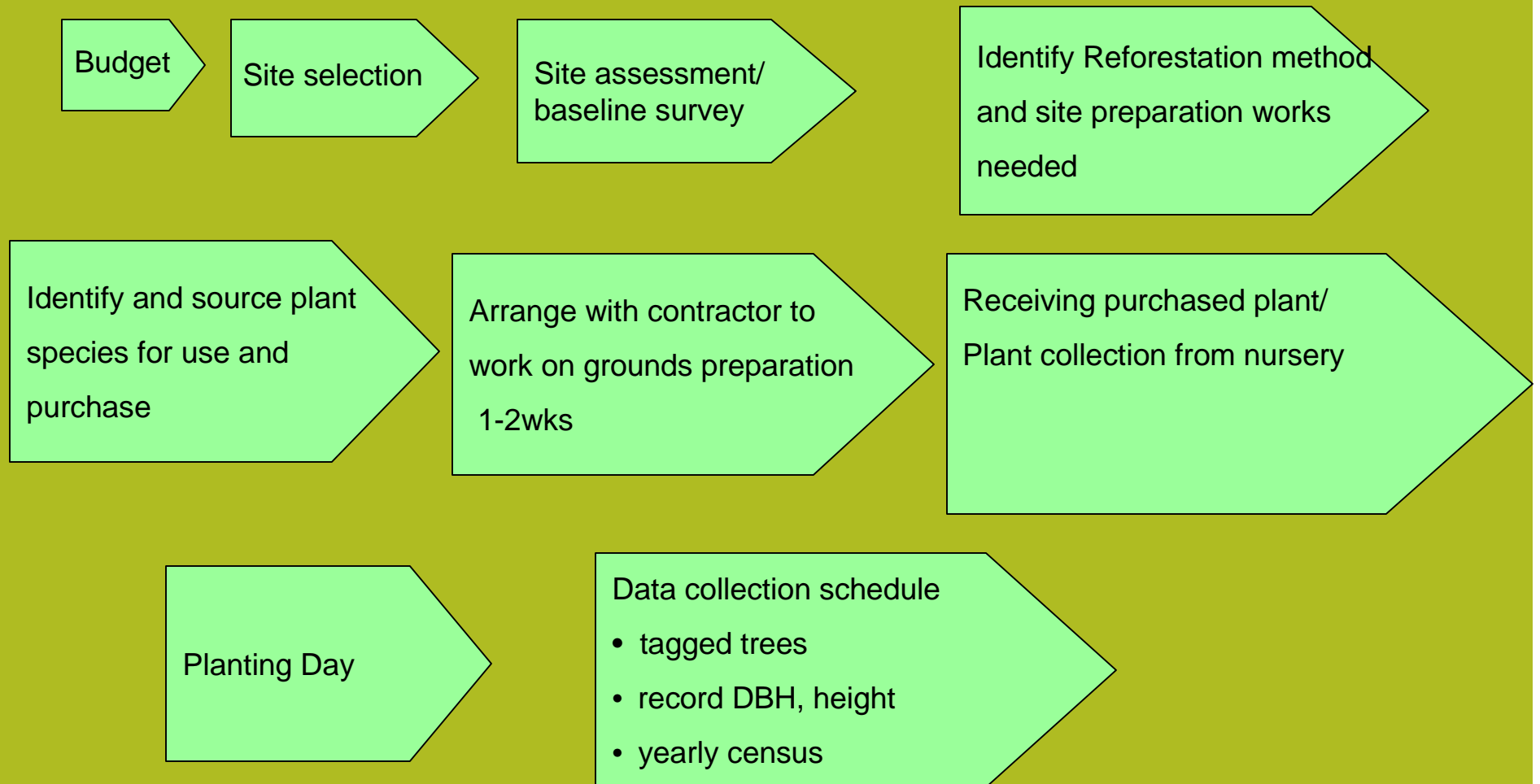
- To ensure proper distribution mix of different tree species
- Planting distance recommended between planting varies 1-3 metres apart according to sapling size, avoiding straight lines
- use original earth as backfill for new planting. This is to encourage new roots to grow out and establish into surrounding soil.

MAINTENANCE SCHEDULE



- Scheduled frequency:
1st month – twice a week for watering
1st - 2nd year – 6 monthly
3rd – 5th years - yearly
- Regular monitoring of planted site will determine the need for more frequent weed control after planting.

WORK FLOW



CHALLENGES

- Limitation of available plants species and numbers that we can propagated to meet local reforestation demand
- To carry out reforestation of degraded sites inaccessible to vehicle/machine
- Limited resource for follow up and long term monitoring of reforested plots

THE END