

# Science Saving Rainforests:

Practical considerations for restoring genetic diversity to 60 tree species of the critically endangered Big Scrub Rainforest



By Renée Borrow



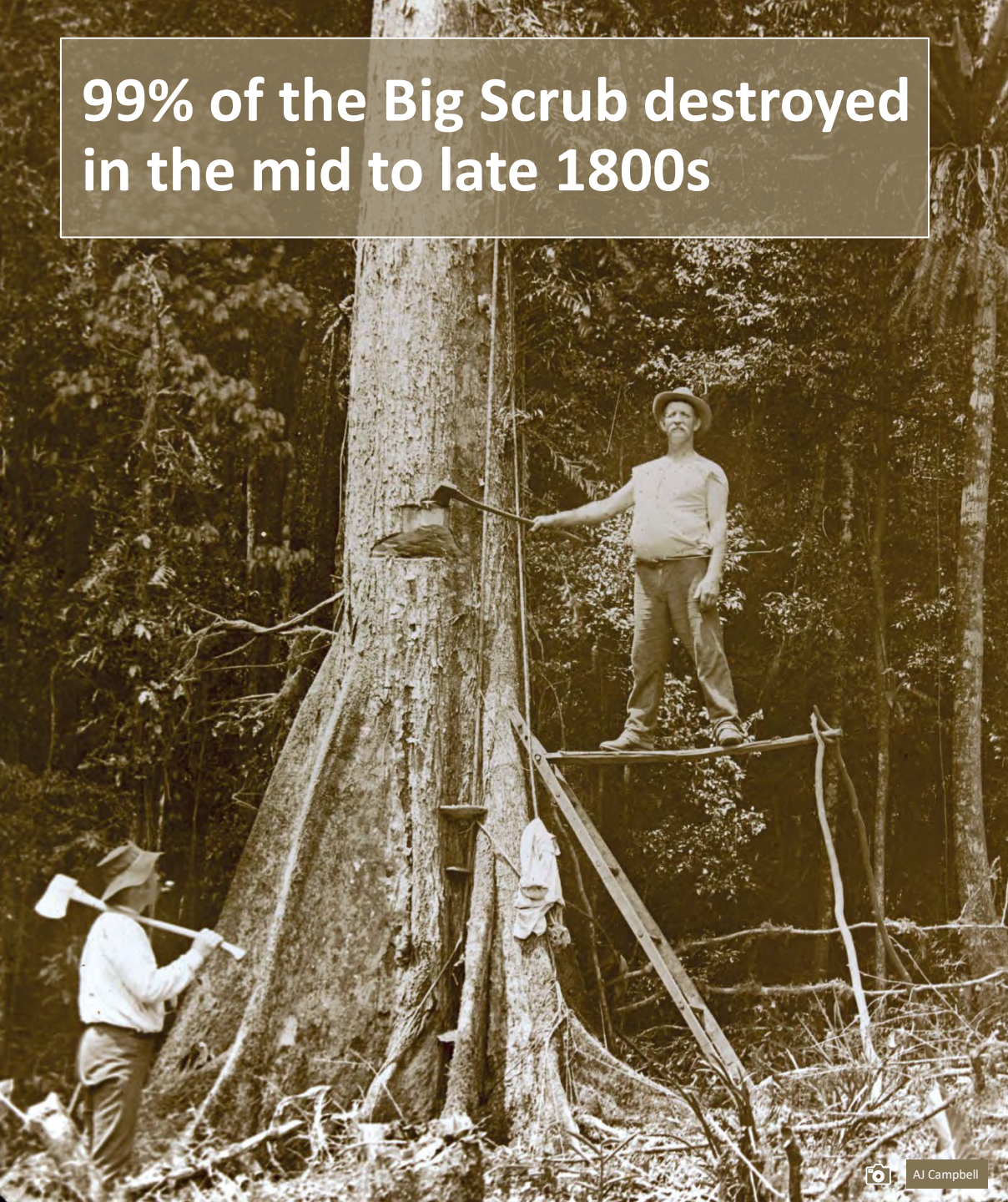
Big Scrub  
Rainforest  
Conservancy

# The Big Scrub

Gondwana-descended and the most biodiverse ecosystem in NSW



99% of the Big Scrub destroyed  
in the mid to late 1800s



Approx 80 small isolated  
rainforest remnants remain

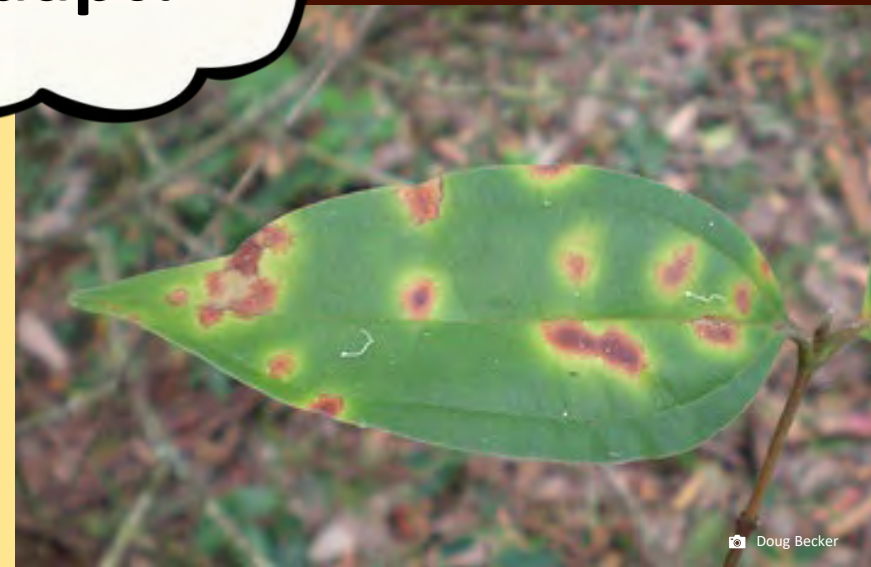
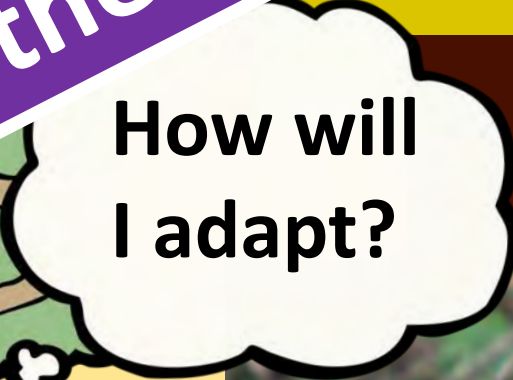
# Reduced genetic diversity = reduced adaptive potential



Climate change



New pests and diseases



Genetic rescue to the rescue!

How will I adapt?

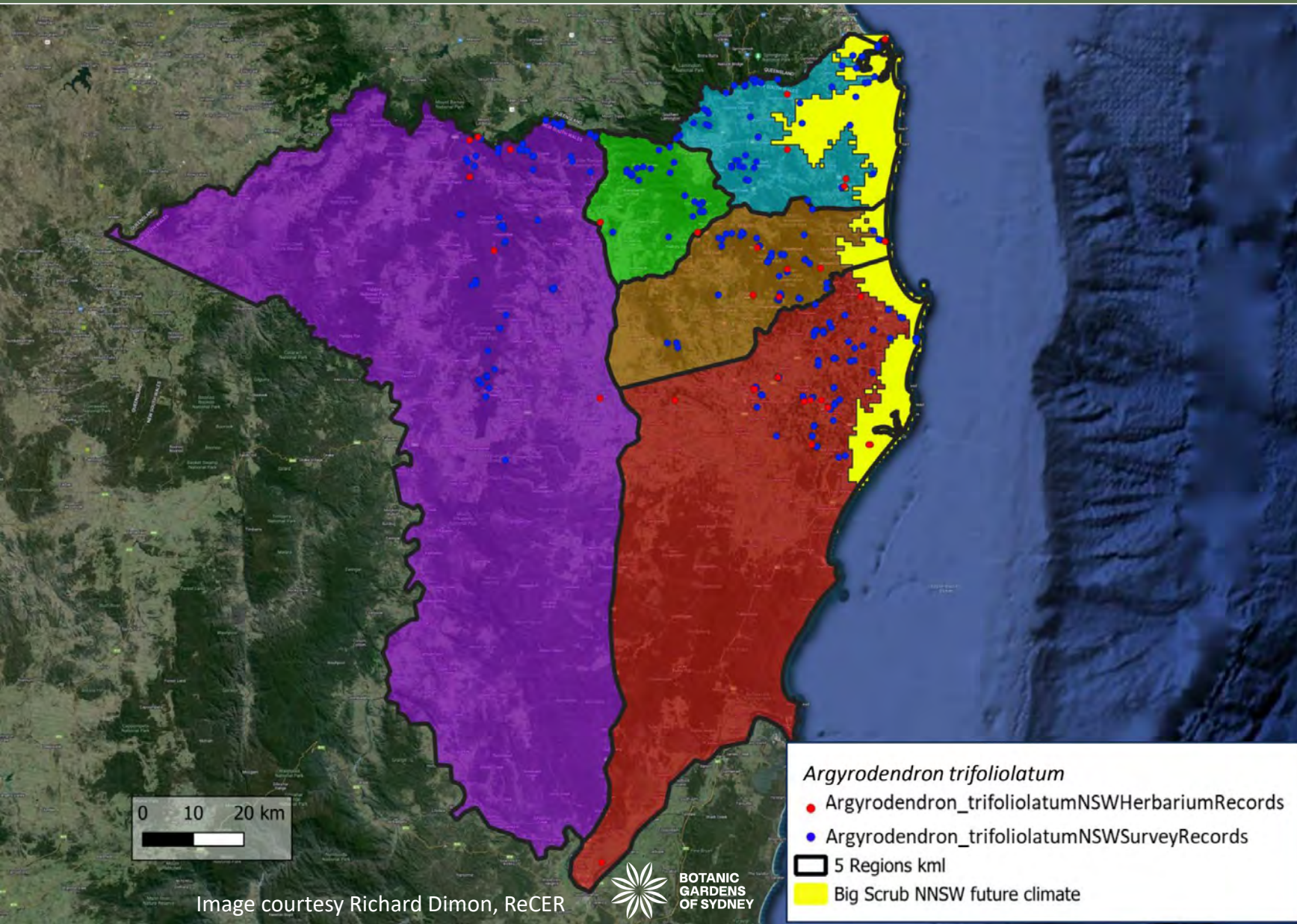
CSIRO

Doug Becker

Almost 10,000 leaf samples collected and undergoing DNA/genome analyses



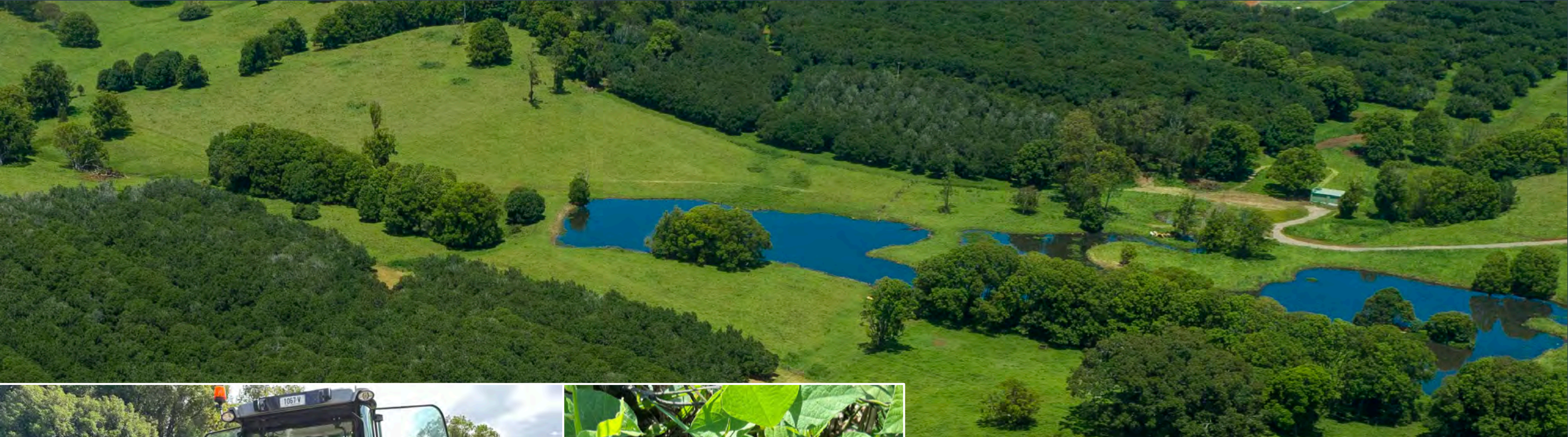
# Sampling guidelines: *Argyrodendron trifoliolatum* (White Booyong)



For 90% genetic diversity collect propagules from 5 individual trees in populations located in each of 5 sub-regions

**= Total 25 trees**

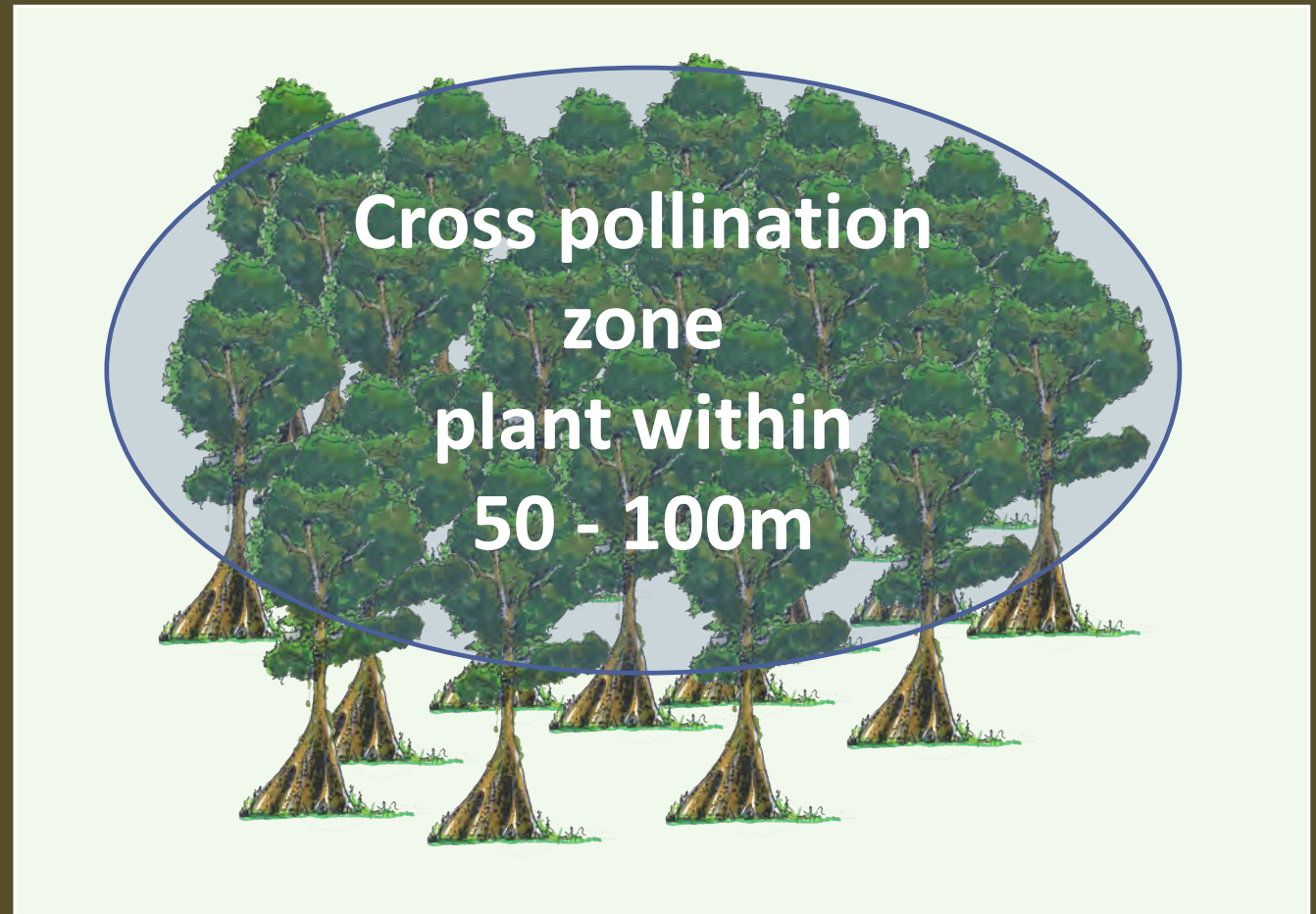
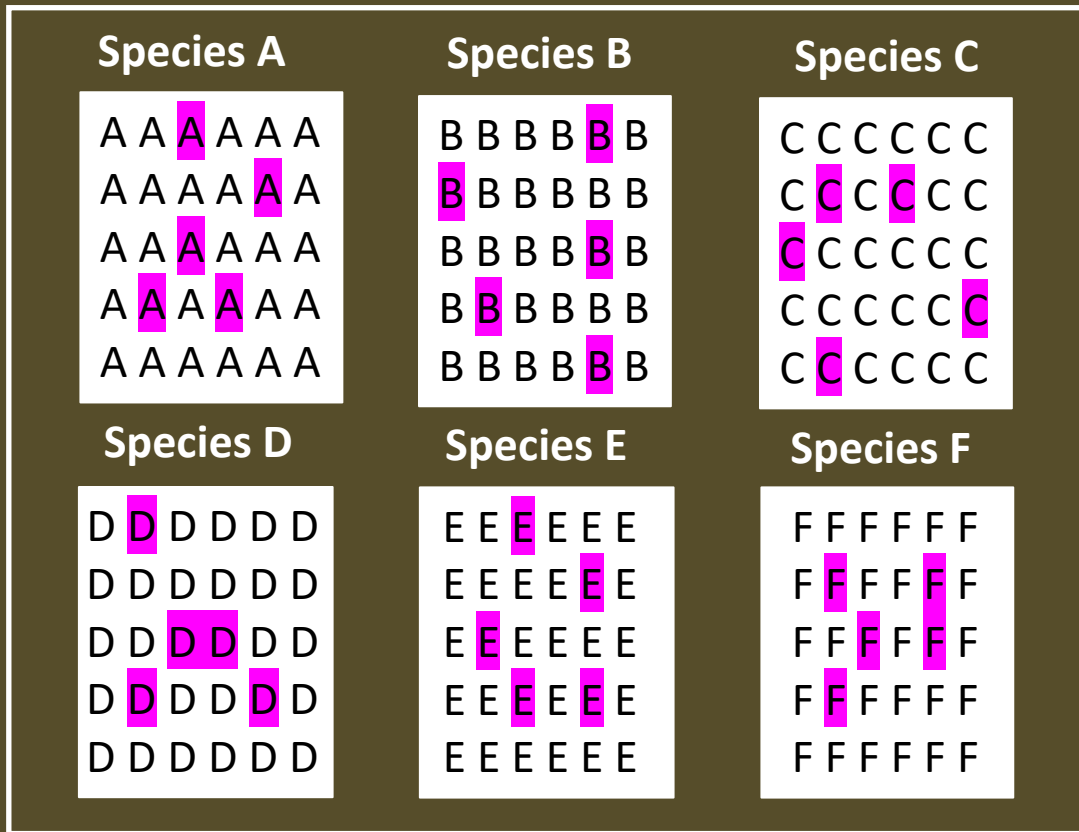
# Plantation site selection and preparation



**Cover cropping was shown to improve %C and %N in soil**

**What about microbial biomass?**

# Plantation layout



- Plant in blocks rather than long rows to maximise cross-pollination
- Randomise layout of individual trees in each species block
- Leave room for Qld future climate-matched propagule material to be added at a later date (see pink highlights in block layout above)



# Develop Propagule Collection Protocols



## Best practice protocols for propagule collection for Science Saving Rainforests Program



### Glossary:

|            |   |
|------------|---|
| RBGS:      | Royal Botanic Garden Sydney   |
| ReCER:     | Research Centre for Ecosystem Resilience (Royal Botanic Garden Sydney)                      |
| ReCER App: | Collection app that you can download to your phone/device to help capture relevant metadata |
| Wildling:  | Small young plant growing in wild population  |

### 1. Metadata

#### 1.1 Metadata to be captured at each site using ReCER App (app instructions – see item 4.):

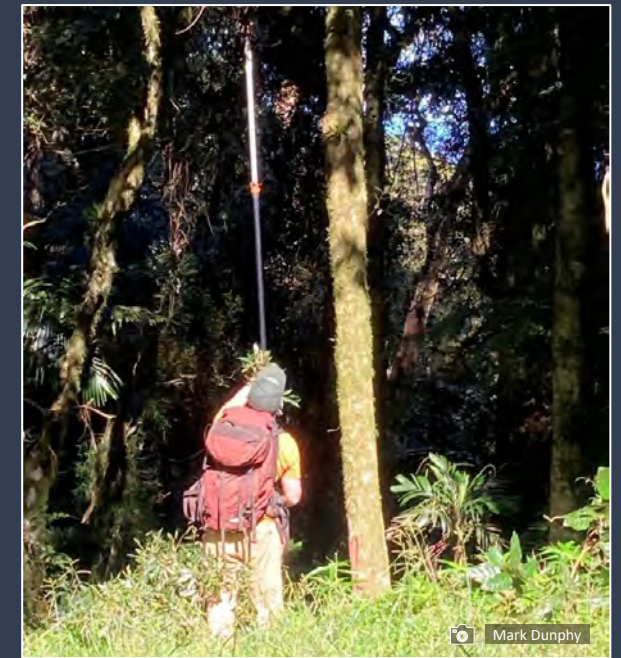
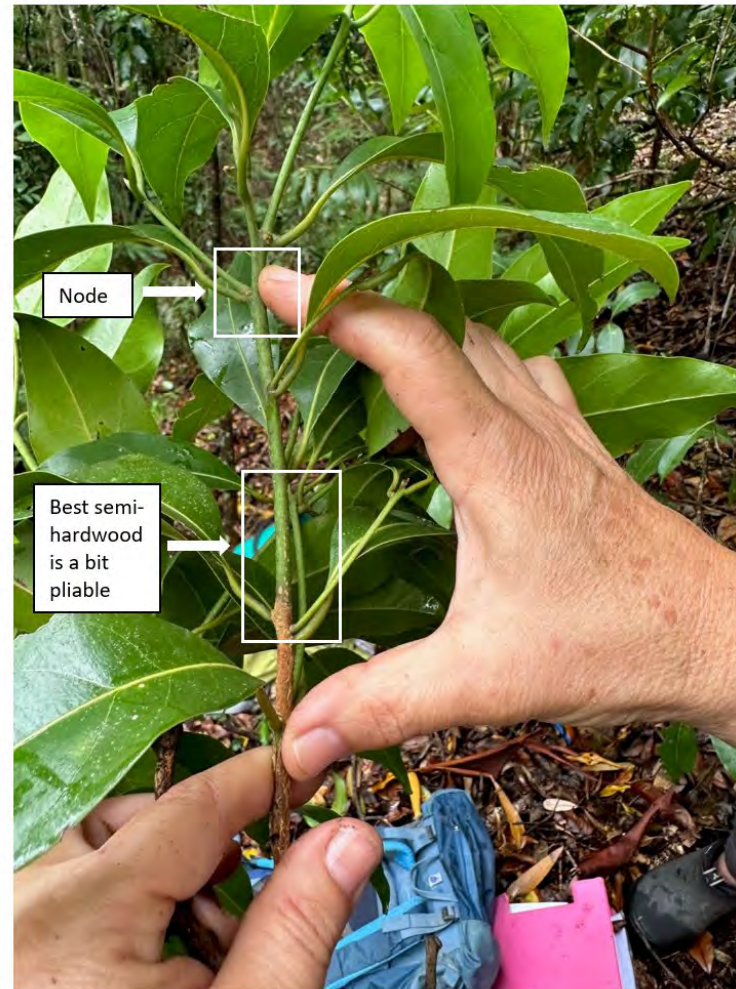
All propagation material will need to be clearly tracked throughout each propagule's entire lifecycle (ie, from wild population, through nursery, living seedbank plantation and beyond). The following details will be required to ensure we have necessary metadata for future use. Please capture as much detail with every propagule collection. Most important metadata to capture:

- GPS coordinates of propagule collection (Latitude/Longitude)
- Name of collector(s)
- Time/Date collected
- Species name
- Cuttings or seed or wildlings taken as propagation material

### 6. Tips for Collectors

#### 6.1 Tips for cuttings collections:

- The following image provides an example of **good** material for cuttings from *Endiandra floydii*. It includes a soft to hard transition and includes a node:



Mark Dunphy



Mark Dunphy

# Project Partners



**Big Scrub  
Rainforest  
Conservancy**

The Voice of the Rainforest

Research Centre for Ecosystem Resilience



**BOTANIC  
GARDENS  
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*Firewheel*  
Rainforest Nursery



**Dr Robert Kooyman**



# Grant funders, financial and in-kind supporters



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Big Scrub Foundation



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