From "*widespread and common*" to "*critically endangered*" – Managing myrtle rust impacts on Scrub Turpentine and Native Guava.

Conservation in Action – Orange 2022

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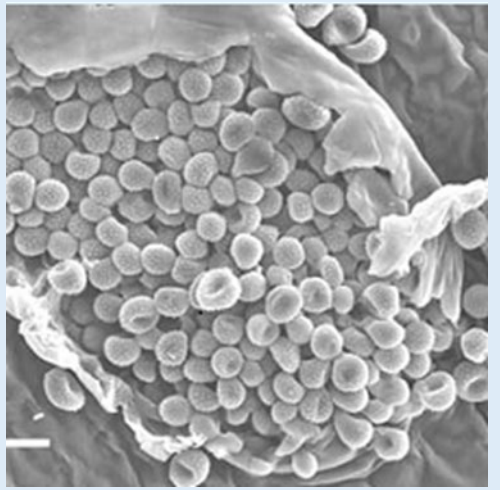
Summary

1. Background on Myrtle Rust
2. Overview of Saving our Species (SoS) projects
3. Update on project progress
4. Future priorities

What is Myrtle Rust?



- Myrtle rust is a disease caused by the exotic fungus *Austropuccinia psidii*
- South American origin
- Arrived in Australia in 2010
- Attacks plants in the Myrtaceae family
  - 480 hosts globally
  - 380 native host species
- Multiple strains exist – only the 'pandemic' strain occurs in Australia – so far…
- Pandemic strain mostly affects species in rainforest, wetland and coastal heath communities.

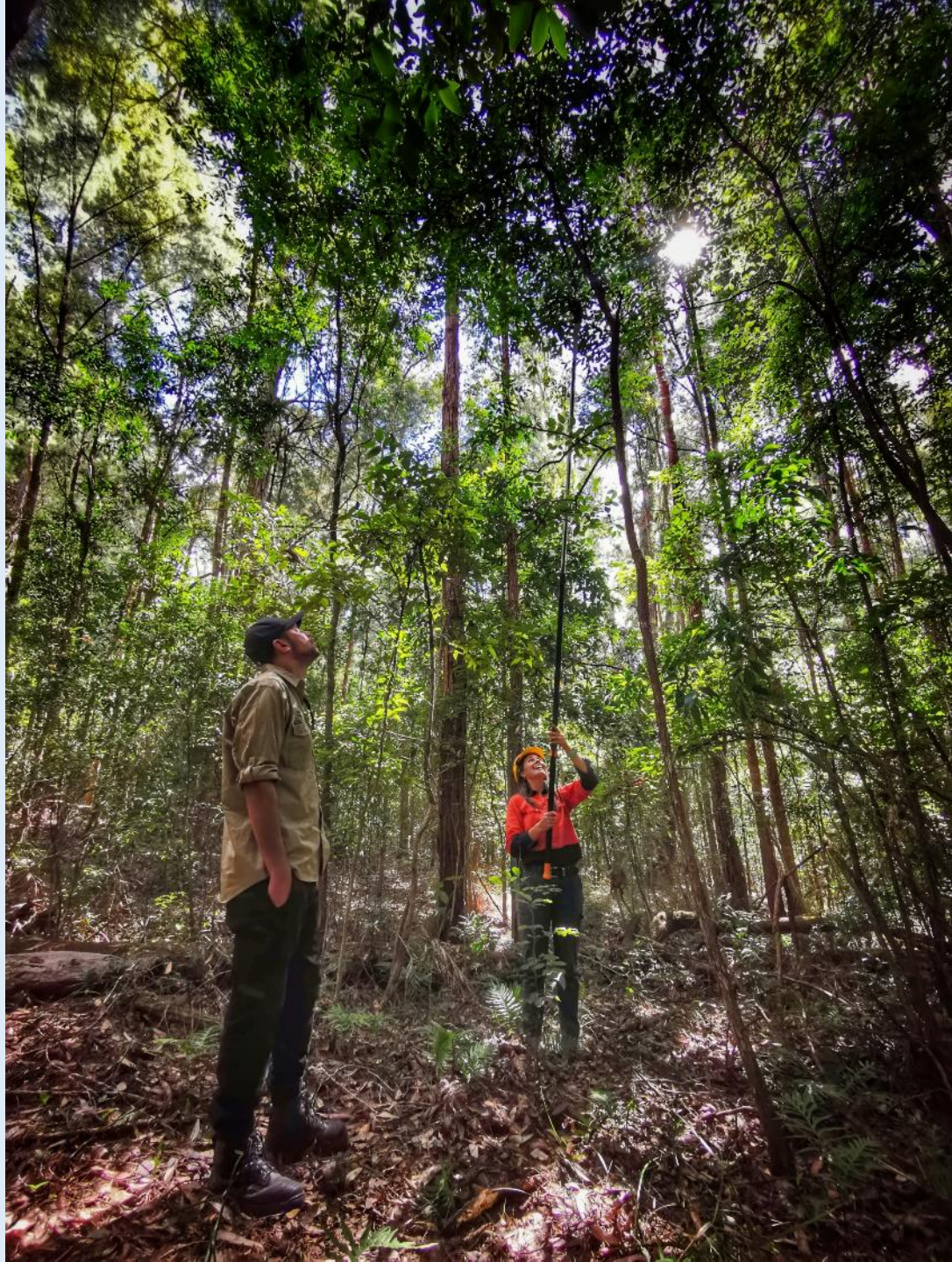
Current NSW SoS funded Myrtle Rust funded projects

1. **Species projects:**

4 species currently listed under the NSW BC Act (2016) in NSW due to Myrtle Rust impacts.

- ***Rhodomyrtus psidioides***
- ***Rhodamnia rubescens***
- ***Lenwebbia* sp. Main Range**
- ***Rhodamnia maideniana***

2. **Myrtle Rust Key Threatening Process Project:** *Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae*

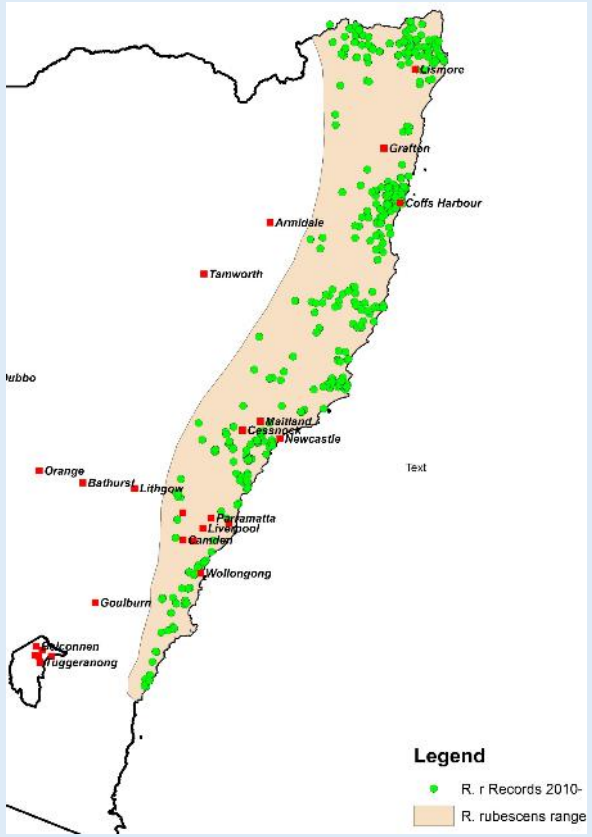


Background – Target Species

Scrub Turpentine (*Rhodamnia rubescens*)

Widespread species - Narooma into SE QLD.

‘Critically endangered’ under the **NSW Biodiversity Conservation Act,** the **QLD Nature Conservation Act** and the **Commonwealth EPBC Act.**

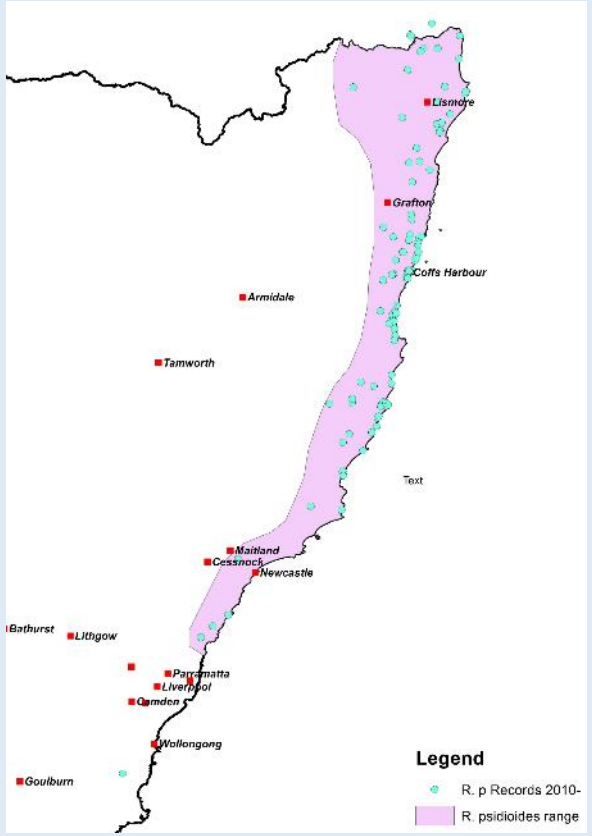


Background – Target Species

Native Guava (*Rhodomyrtus psidioides*)

Widespread species - Gosford to SE QLD.

'Critically endangered' under the **NSW Biodiversity Conservation Act,** the **QLD Nature Conservation Act** and the **Commonwealth EPBC Act.**



Background – Target Species

1. Both species are currently **suffering rapid declines** due to Myrtle Rust.

2. Flowering and seed production are also affected by Myrtle Rust and **seedling recruitment is thought to be non-existent for both species**.

3. Remaining wild plants are **likely to disappear in the near future (5-15 years).**

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NSW Emergency Response project

Rate of decline has been rapid for both species.

- **Populations declines = loss of genetic diversity**
- **Genetic variation essential for long-term recovery.**

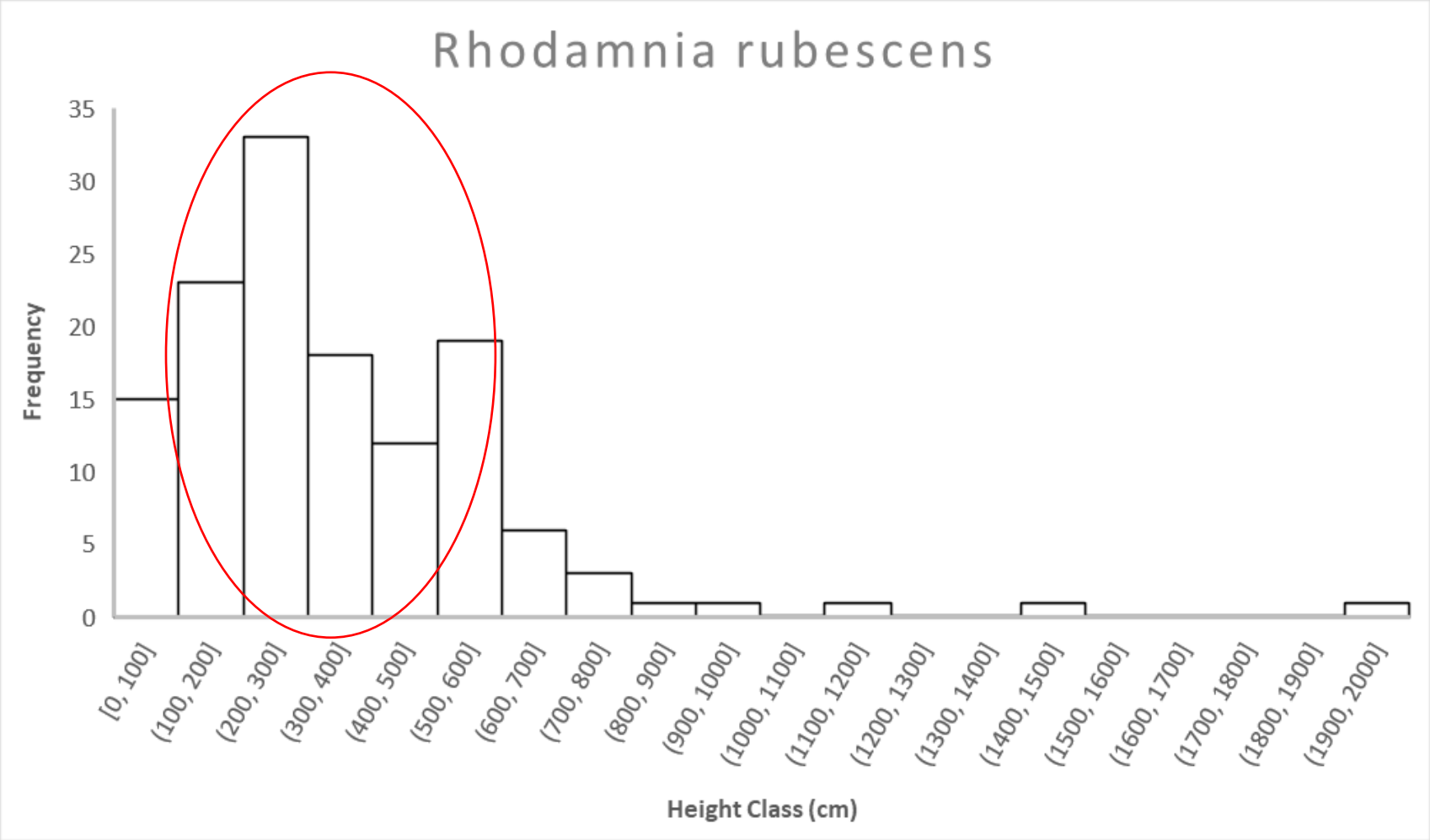
Emergency response has focused on capturing this genetic variation before it is lost.

NSW Emergency Response project

Over the past 3 years the SoS project has focused on:

1. Undertaking **rapid field assessments of rust impacts.**
2. Collecting leaf samples to allow **conservation genomic studies to investigate population genetics** and **inform ex-situ collections.**
3. **Developing a living ex-situ collection that capture as much genetic variation as possible.**

Rhodamnia rubescens: Field Assessments



Most plants existing as small to medium sized plants (2 – 6m high).

Larger individuals also found (up to 20m).

Common to see individuals with good leaf cover.

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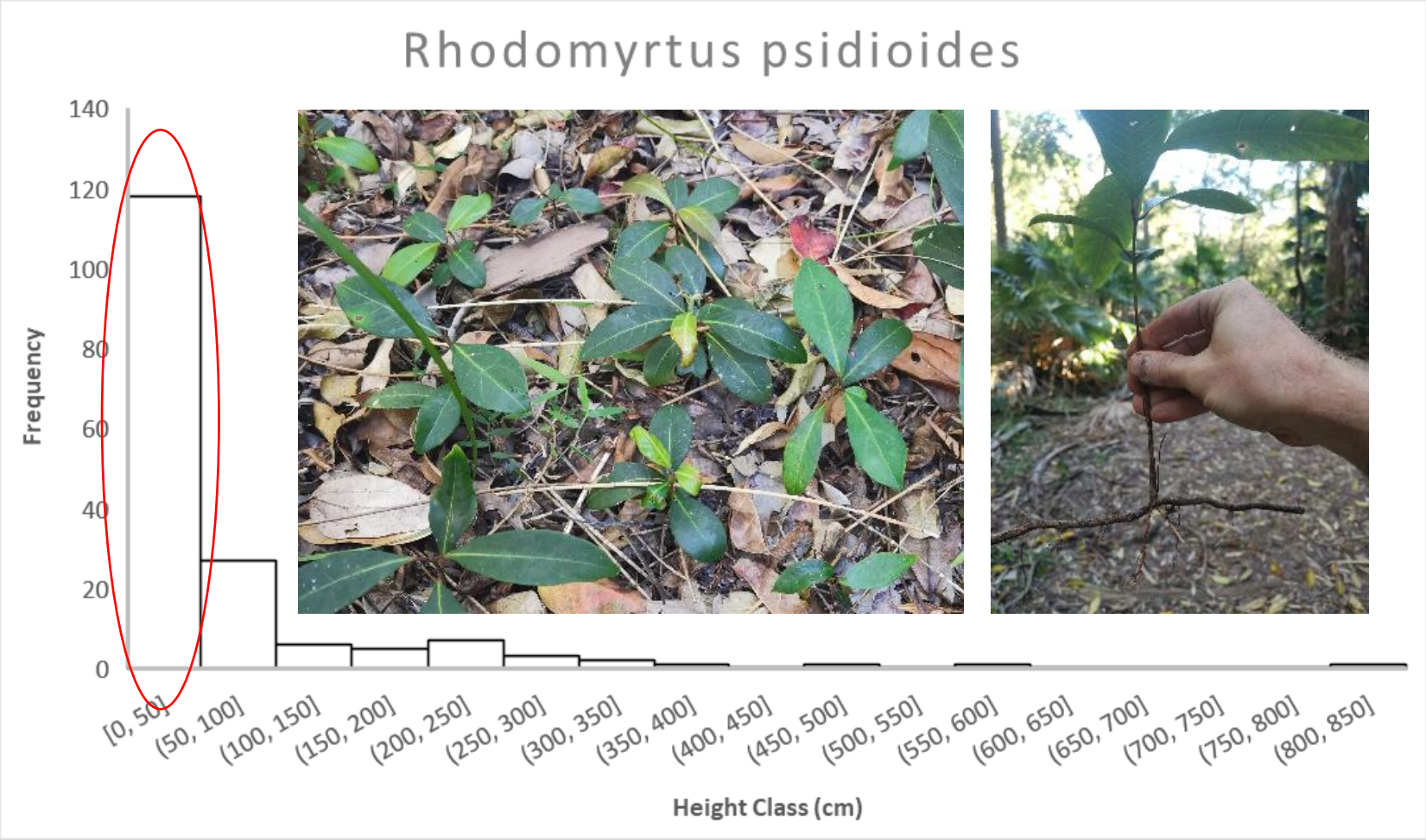
Rhodomyrtus psidioides: Field Assessments



Mostly found as small suckers under 50cm high.

Largest individual found was over 8m tall and healthy!

Larger plants are mostly heavily infected and in poor health.

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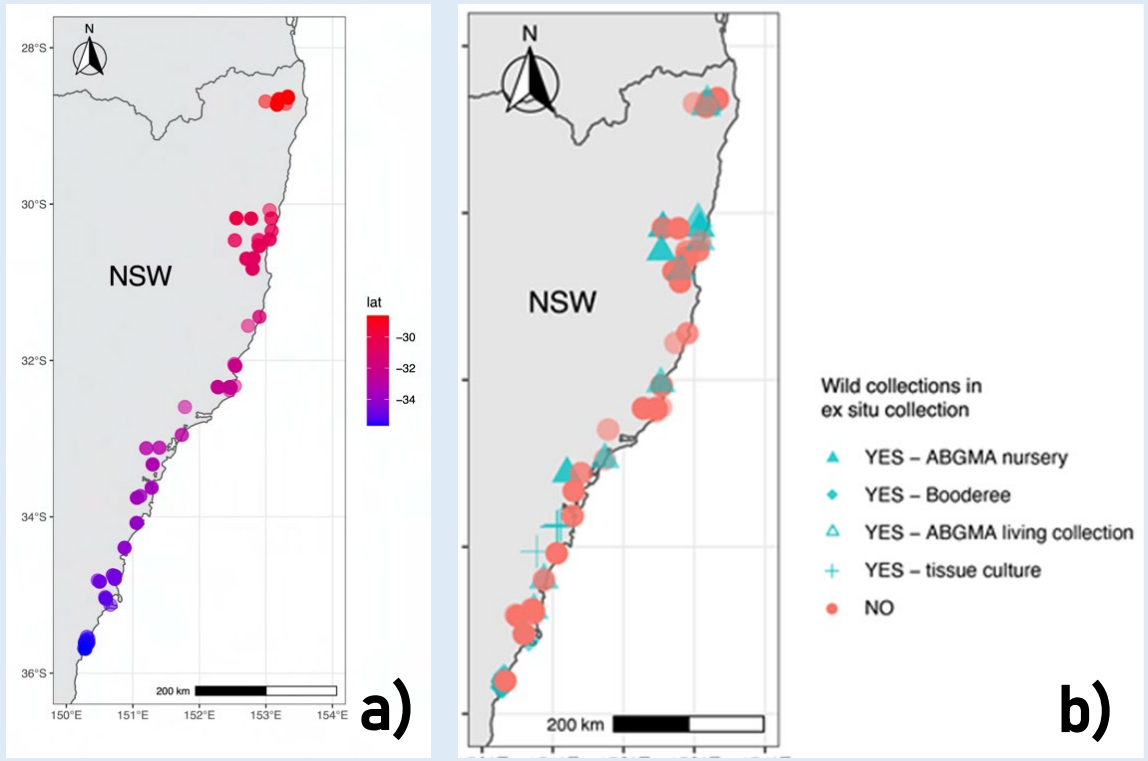
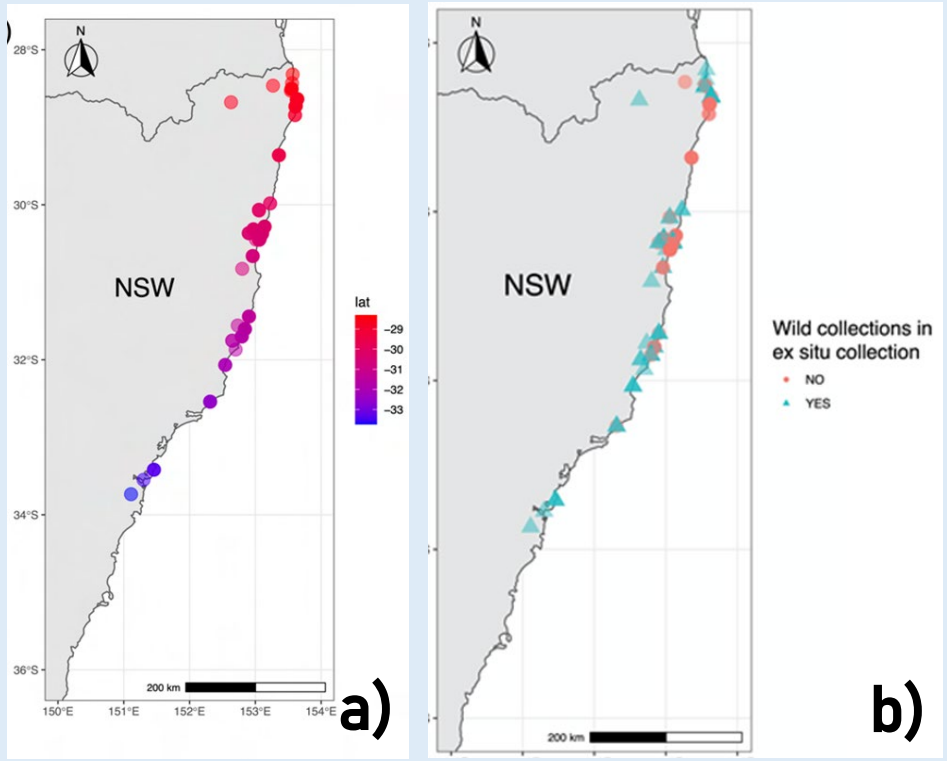
Conservation Genomics - Genetic Diversity

Rhodamnia rubescens: 281 specimens sampled from 43 sites across NSW.

Rhodomyrtus psidioides: 191 specimens sampled from 34 sites across NSW.





Genetic diversity is present in both species, and is distributed along a latitudinal gradient

a) Map of sampled plants (Chen et al. 2022)

b) Map of sampled plants (orange) and plants in ex situ collections (blue)

Future priorities

1. **Targeted germplasm collections and field surveys**
    i. Continue searches for rust resistant plants
2. **Dispersal of ex-situ collection**
    i. Replicate plants held at multiple botanic gardens
3. **Susceptibility trials and seed orcharding**
    i. Susceptibility assays are currently being completed
    ii. Trials of seed orcharding likely to start over the coming 12-18 months

Thanks for listening

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The Australian Botanic Garden Mount Annan

The Royal Botanic Garden Sydney

Australian Network for Plant Conservation Inc