Increasing the salty feet canopy in the Lower Hawkesbury through a multidisciplinary partnership

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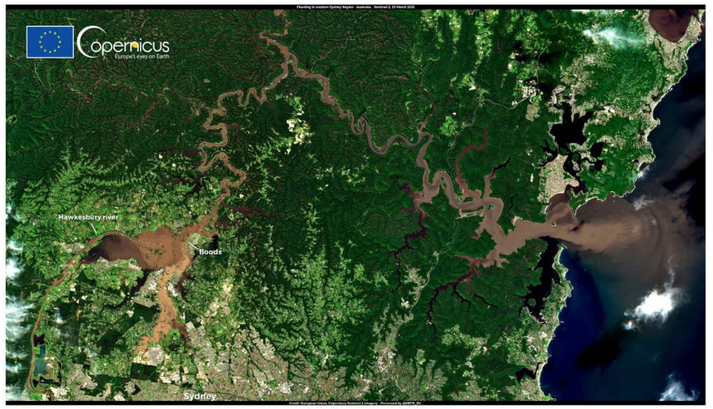
AIM OF OUR PROJECT

Learn how to propagate mangroves to increase canopy where needed

WHY?

- Increased boat wash/wake, undercutting
- localized hailstorms
- floods, dam releases
- coastal development, infringements of coastal vegetation protection, seawalls
- future threats from global warning (i.e. increased temperatures)

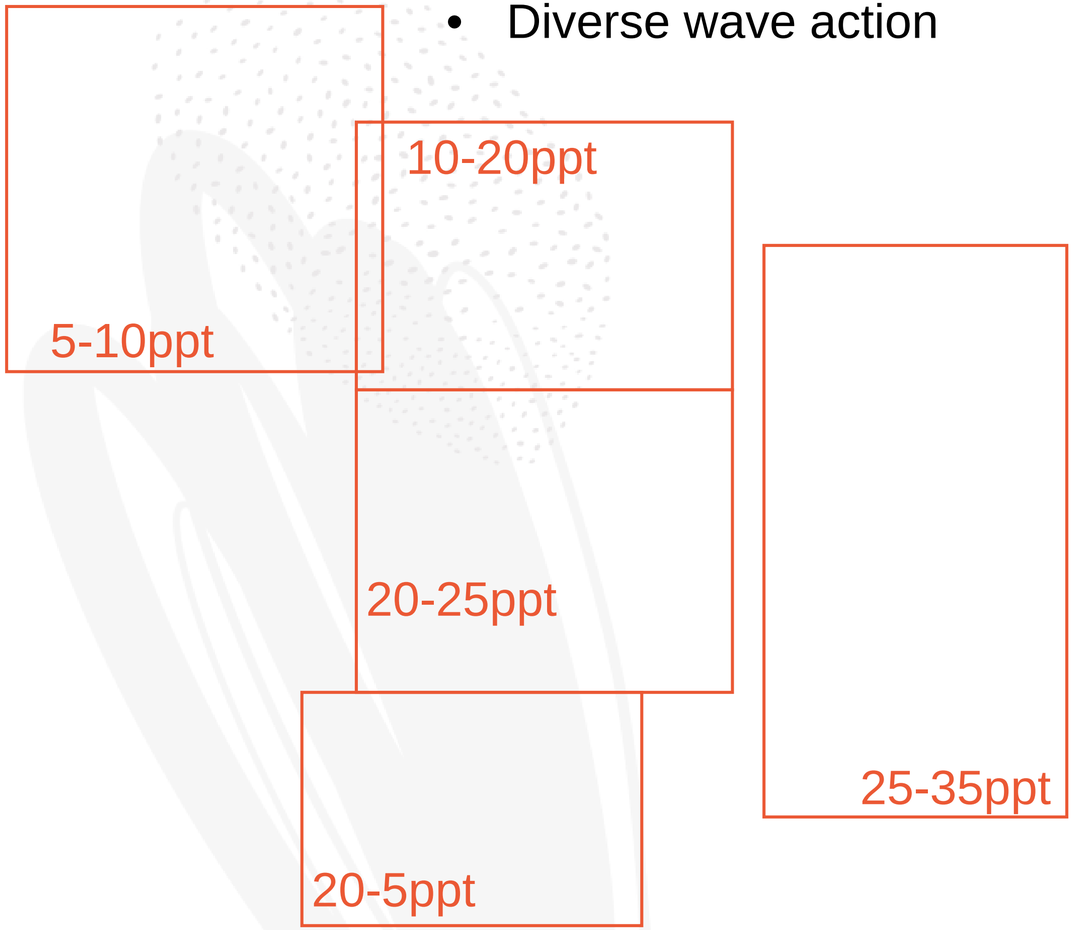







MANGROVE CANOPY IN THE HAWKESBURY

- Total area of mangroves 983 Ha
- Diverse salinity levels
- Diverse soil types
- Diverse wave action



Upstream creeks / low salinity

Downstream/ oceanic / high salinity

GM
RM

GM = Grey Mangroves, *Avicennia marina*
RM = River mangroves, *Aegiceras corniculatum*

ECOLOGY/BIOLOGY OF OUR MANGROVES

Grey **Mangroves** - *Avicennia marina*

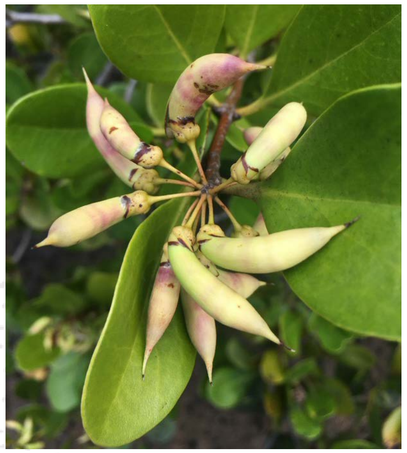




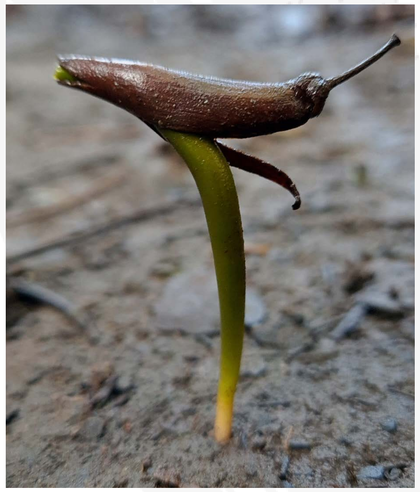

- Seeds abundant October-December
- Seeds covered by a buoyant outer husk
- Seeds large in size, high energy content
- Quick root development and cotyledon leaves
- Buoyant – movement with tides, widespread
- Larger size overall- more commonly known
- Pioneer species, likes disturbed areas

ECOLOGY/BIOLOGY OF OUR MANGROVES

Grey Mangroves - *Avicennia marina*






- Seeds abundant January- April
- Crypto-viviparous
- Seeds small in size, fall off tree easily before ready to germinate
- Slow development: root development with husk still attached
- Not buoyant – sink quickly, little spread
- Low survival of germinating seeds growing to adults
- Prefers undisturbed, sheltered sites for germination

FIELD TRIALS

Propagating from seed

√ keep the seed husk on

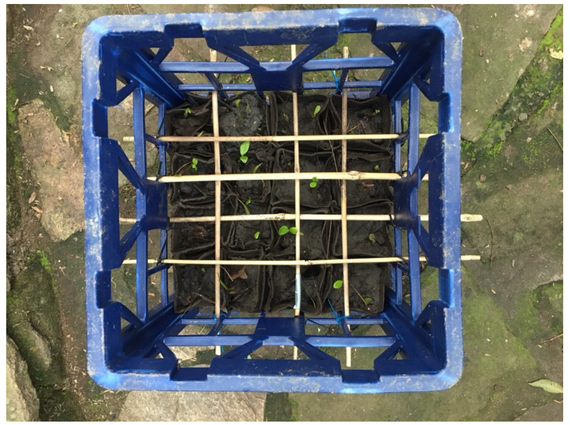
►do not bury germinating seed

√ leave seed on surface of potting soil

√ need sunlight for better development

√ likes estuary black thick mud

► use tubes that will hold mud

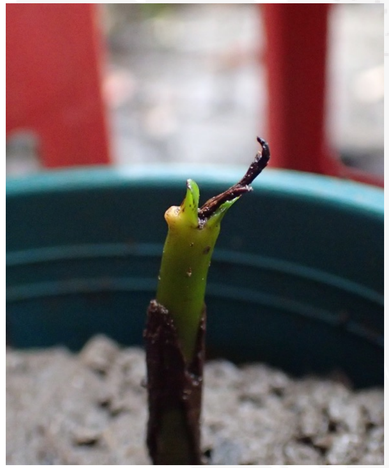


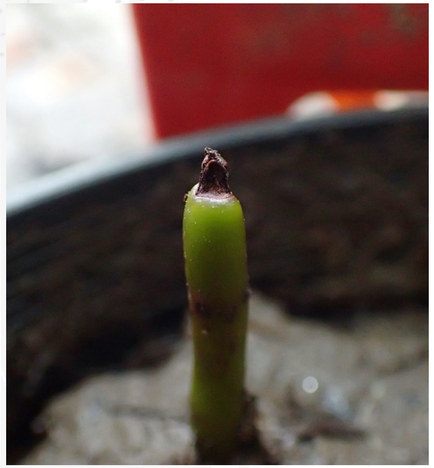
► secured small pots

√ medium-size pots are better

FIELD TRIALS
Issues

Crabs – love living among our seedlings!





Something finds mangrove seedlings tasty!

All forms of seeds across a year could be found at the same time in the same spot

Filamentous macroalgae blooms

TRIALS AT THE NURSERY

The main aim was to use readily available facilities to grow the mangroves i.e. fresh water irrigation, prop tunnels, growing procedures for seedlings at the nursery.

PROPOGATION BY SEED

- The best time to collect the seed is in April when ripe, on the ground, and root starting to sprout.
- Seed growing mix of 50/50 river sand and coco peat plus native slow release fertiliser.
- Different types of covers. Vermiculite, perlite and no covering.

TRIALS AT THE NURSERY

- Existing propagation tunnel with overhead misters, heated benches, controlled humidity and lighting.

- Direct sowing into tubes vs. potting on. This was also testing root disturbance.

TRIALS AT THE NURSERY

PROPOGATION BY CUTTING

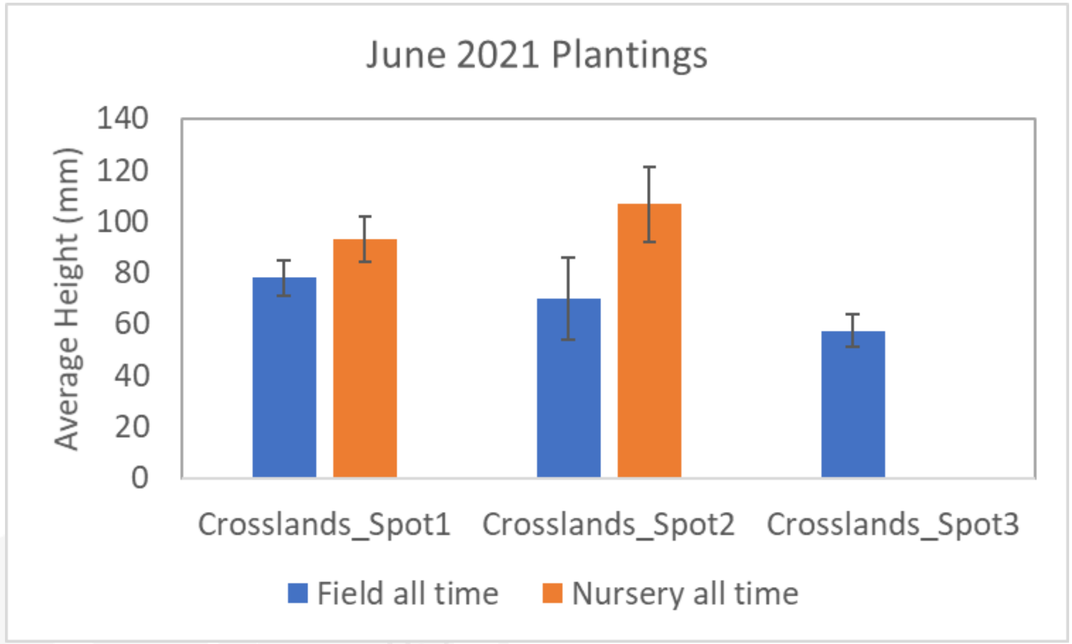
- Cuttings collected in the cooler months
- Cuttings strike best when old growth is included in cutting
- Cuttings treated with root growth hormones and inserted into Jiffy plugs on heated benches.
- Can take 3 months to strike (see roots). White small roots needed to be present to pot on. Must keep newly potted on cuttings in propagation tunnel

TRIALS AT THE NURSERY

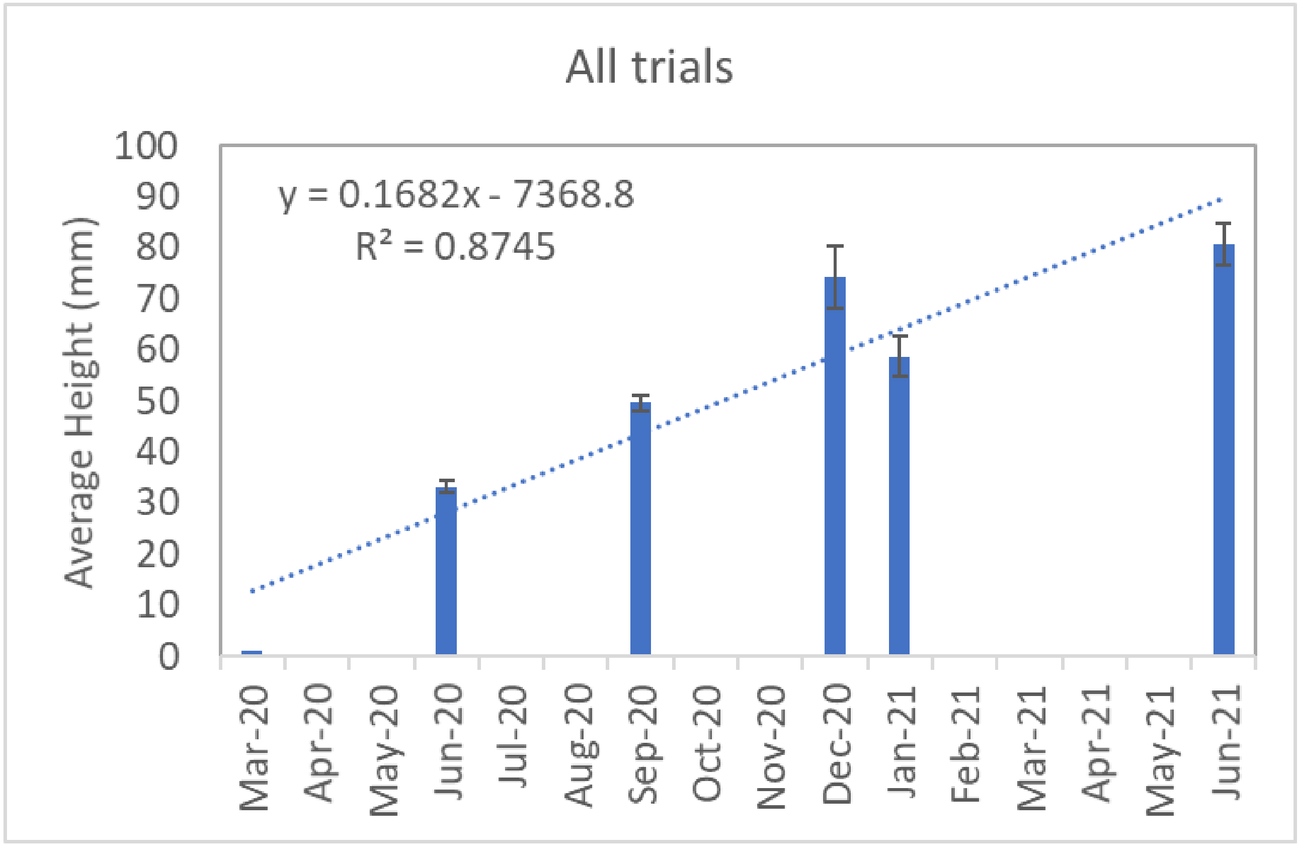
TUBING UP & GROWING ON

- Tubing up seedlings was done when first leaves appeared and roots had developed.
- Best results were seen with a 50/50 mix of estuary mud and nursery native potting mix.
- First potted in 50mm tubes then onto 140mm pots.
- Incredibly slow growing. 1 years growth seen in photos to the side.

LESSONS FROM PLANTING



Nursery plants tend to be larger but showed slight nutrient deficiency



Very slow growth of seedlings
after 1.5yr average height 80±4mm

WHAT'S NEXT

- Hope to grow stock plants to collect more cuttings. Cuttings from the nursery generally have better success.
- Create a manual on how to grow and plant River Mangroves.
- Continue to grow River Mangroves and trial best planting methods for success in the wild.

EDUCATION VIDEOS

Mangroves – Our Smelly Friends
https://youtu.be/Hrb56tFnbDU

A Helping Hand for Mangroves
https://youtu.be/Tuwd65jata0

ACKNOWLEDGEMENTS

- Hornsby Bushcare volunteers and community members
- Hornsby Shire Council's nursery staff
- Shoalhaven Riverwatch

This project received grant funding from the Australian Government's Communities Environment Program

Australian Government

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