

Forest biosecurity surveillance in NSW

Angus Carnegie

Matt Nagel, Dave Sargeant

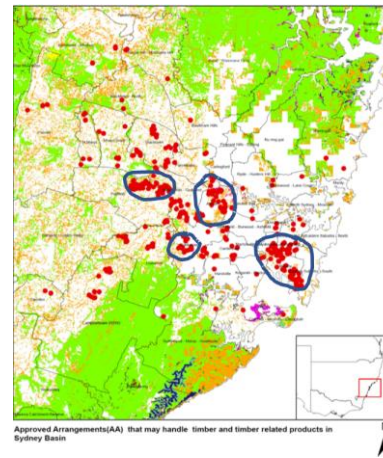
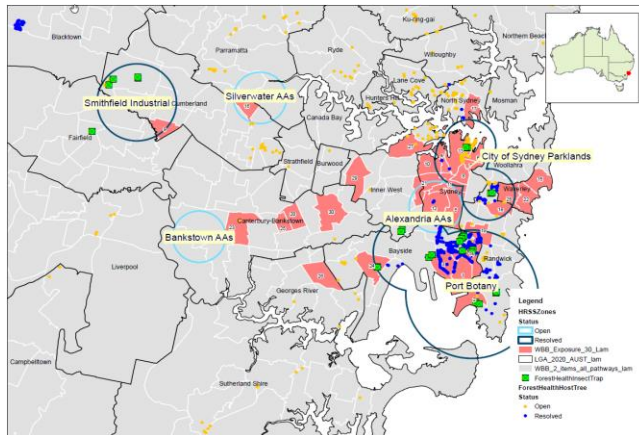
Forest Science

NSW Department of Primary Industries

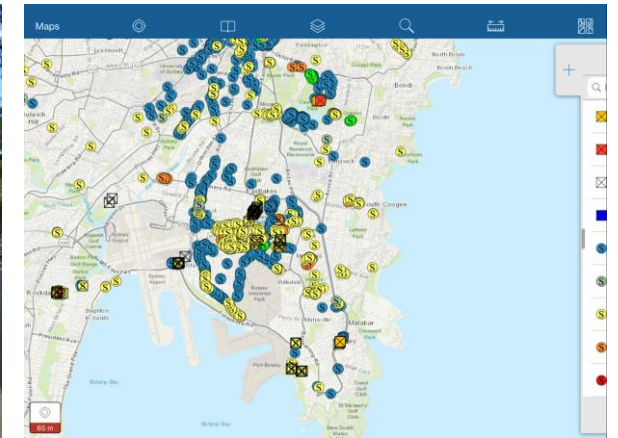
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Forest biosecurity surveillance program

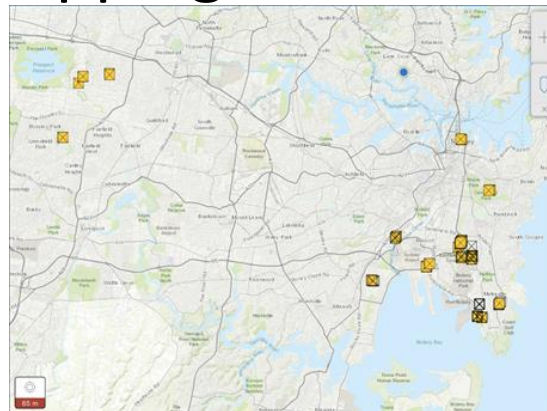
1. Identify risk zones



3. Sentinel tree surveillance



2. Insect trapping



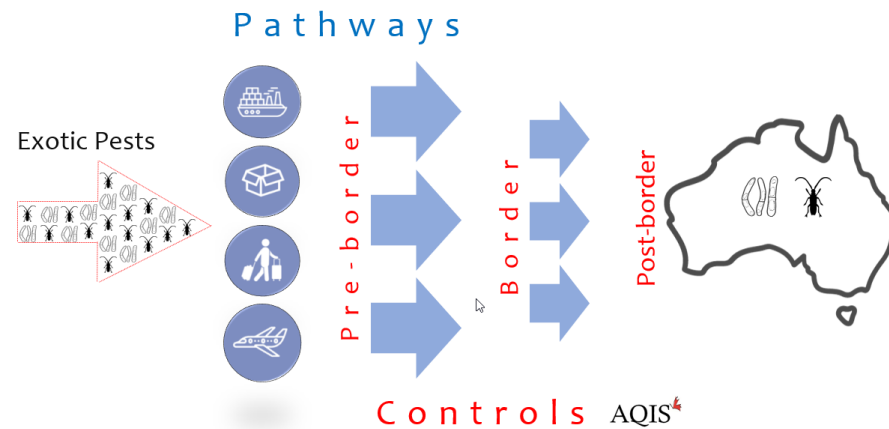
4. Diagnostics



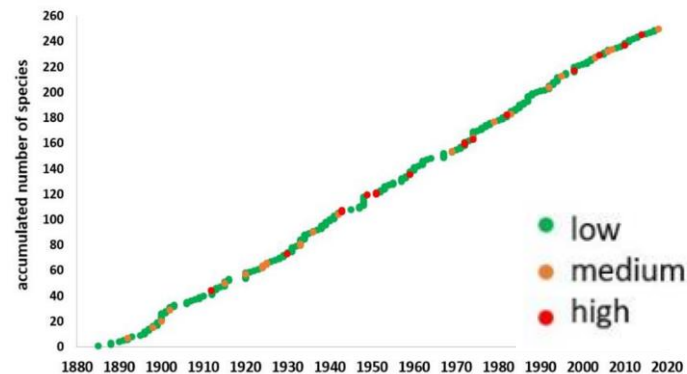
5. Stakeholder engagement...

Stakeholder engagement: why?

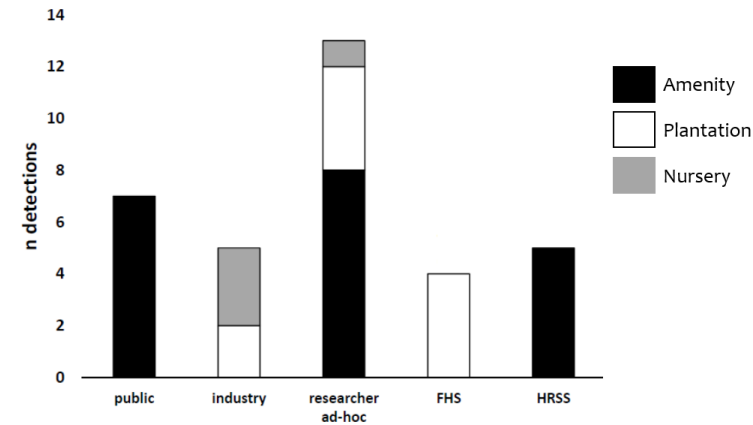
- Risk of pest entry...



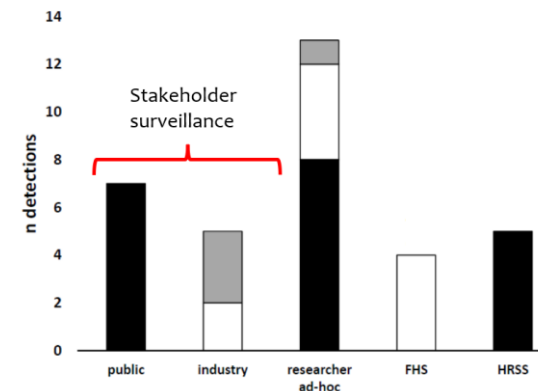
- ...and establishment



- Pests detected on amenity trees...



- ...by public, industry



Stakeholder engagement: how?

- Workshops...





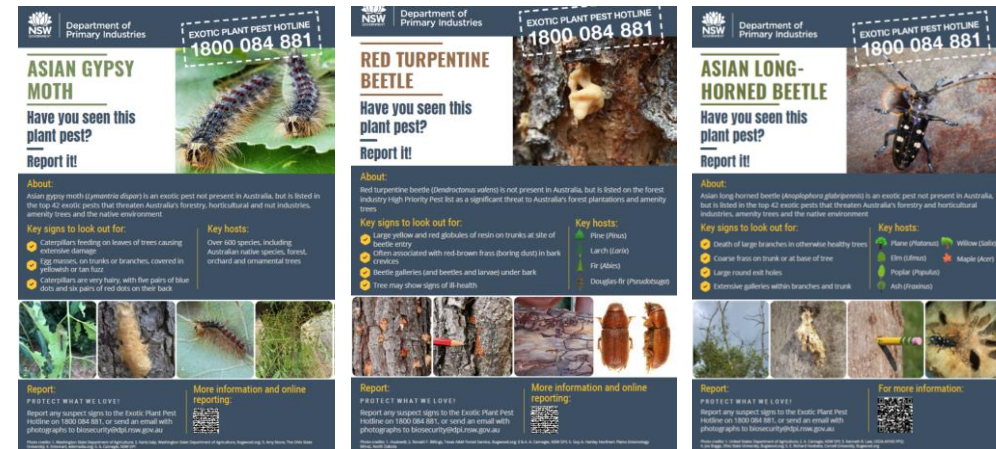

Exotic forest pest surveillance: amenity trees

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- ... and field days



- Forest Pest Factsheets



ASIAN GYPSY MOTH
 Have you seen this plant pest?
 Report it!
 EXOTIC PLANT PEST HOTLINE 1800 084 881

RED TURPENTINE BEETLE
 Have you seen this plant pest?
 Report it!
 EXOTIC PLANT PEST HOTLINE 1800 084 881

ASIAN LONG-HORNED BEETLE
 Have you seen this plant pest?
 Report it!
 EXOTIC PLANT PEST HOTLINE 1800 084 881

- Newsletter, webpages

www.dpi.nsw.gov.au/biosecurity/plant

www.dpi.nsw.gov.au/forestry/science/forest-health

<https://courses.tocal.nsw.edu.au/programs/gatewaypestsnsw>



Gateway Pests of NSW
 Started Sep 30, 2021
ENROL
 Courses available in this program:
 Gateway Pests of NSW Module 1 & 2
 Gateway Pests of NSW Module 3
 Gateway Pests of NSW Module 4
 Gateway Pests of NSW Module 5
 Gateway Pests of NSW Module 6

Stakeholder engagement: who?

Local Councils



Parks & Gardens, Cemeteries



Golf Courses

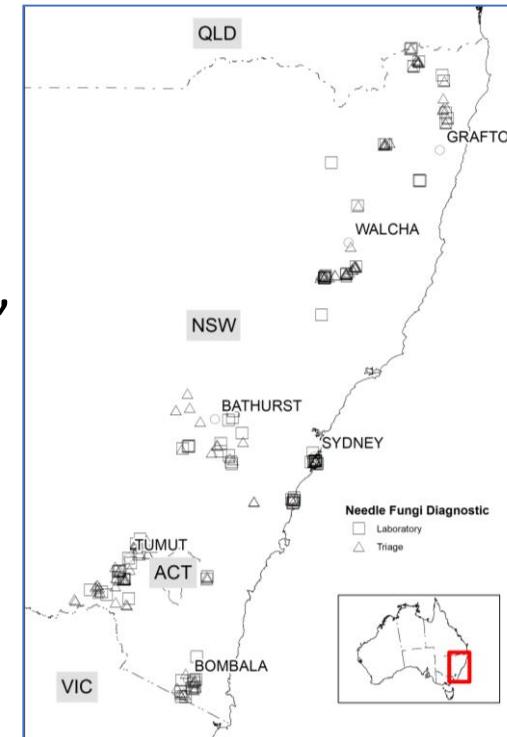


Government & industry bodies etc.



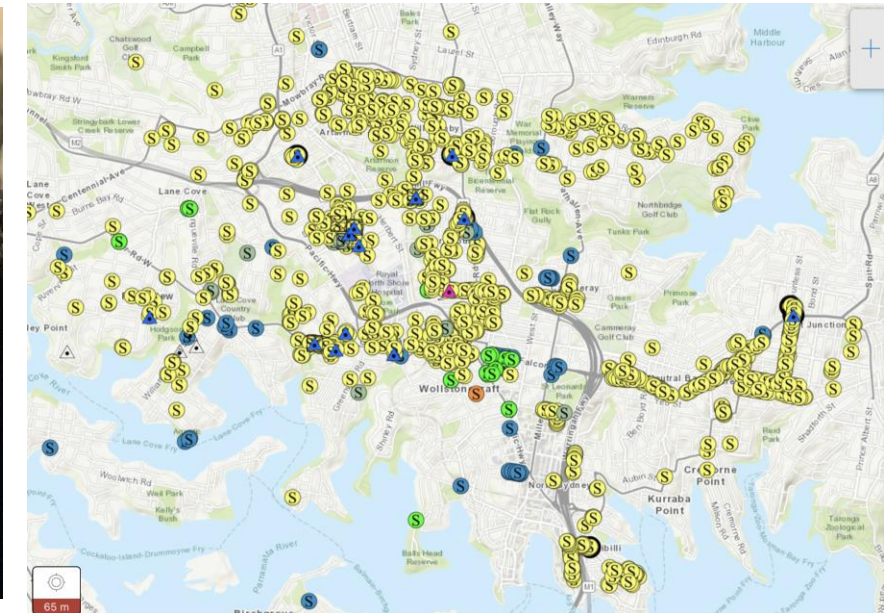
Forest **health** surveillance: *holistic* approach

- Forest health surveillance across plantation estate
 - 250,000 ha pine and eucalypt
- Targeted surveillance and diagnostics for cryptic or specific pests
 - Pest-specific diagnostics
- Provides baseline of pest presence
- Enables Pest Area Freedom declarations
 - “NSW free from *Pseudocercospora* Needle Blight”



Response to exotic pest detections

- Tea shot hole borer, Sydney, 2022
 - Detected dieback and frass on box elder
 - Symptoms same as polyphagous shot hole borer (emergency response in Perth)
 - Timely diagnostics determined not exotic beetle or fungus
 - Not necessary or feasible to eradicate



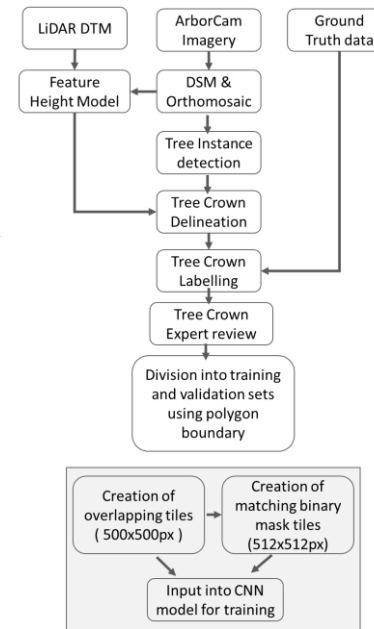
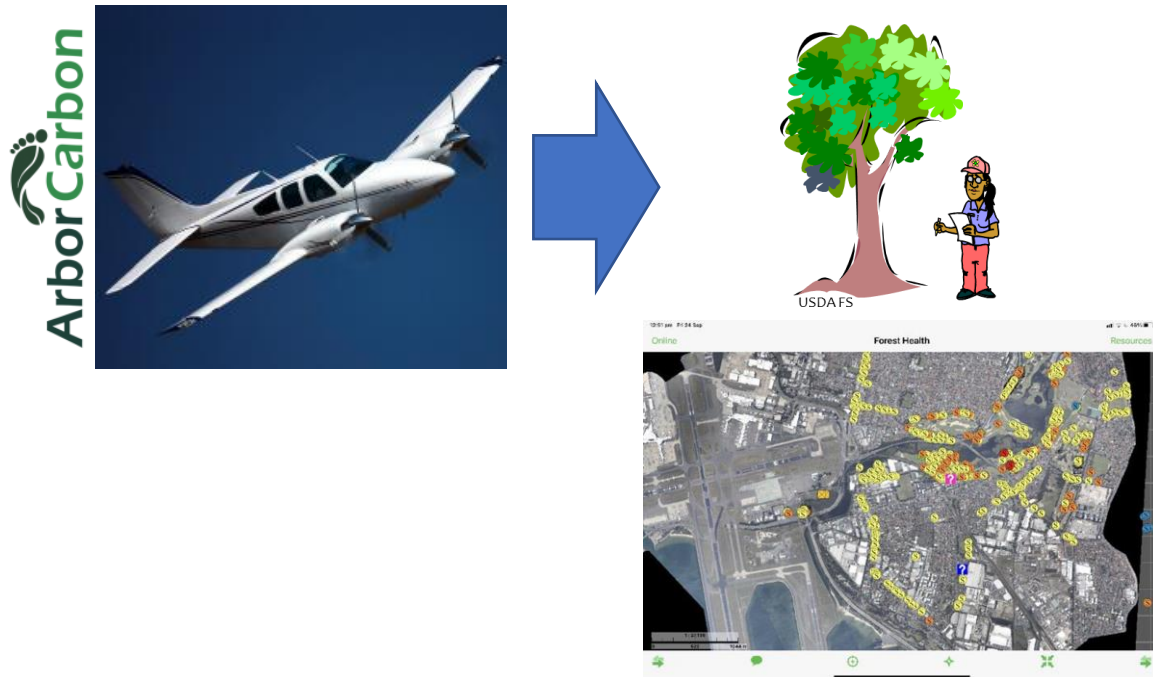
Response to exotic pest detections

- Unusual symptoms on pine seedlings in production nursery, Tumut, 2021
 - Tool-box talk on biosecurity
- Quarantined the nursery awaiting diagnostics
 - *Fusarium commune*, new to Australia
- Pathogenicity tests; diagnosis from other nurseries
- Not necessary or feasible to eradicate
- Take home messages:
 - Stakeholder engagement works
 - Need improved communication with industry during responses
 - Review of risks and potential management strategies for key pests



Remote sensing and AI for forest biosecurity

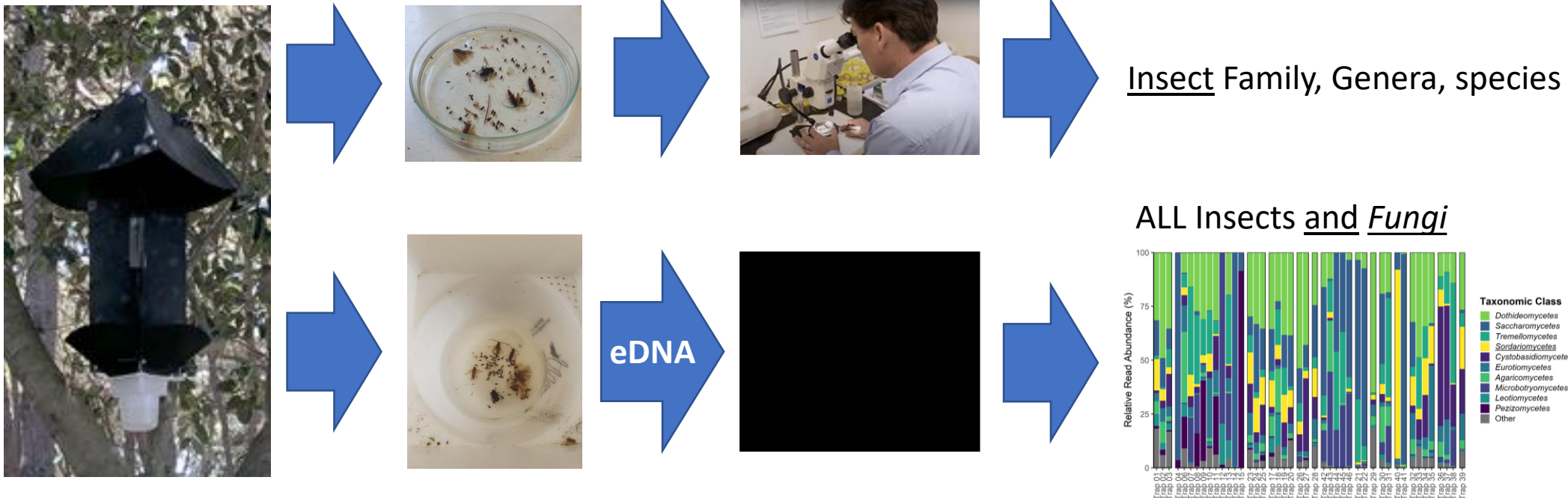
- Sentinel tree surveillance
 - Currently need to do on-ground surveillance to locate trees
- Remote sensing and machine learning



95% accuracy

Transforming diagnostics

- High throughput sequencing and metabarcoding to detect multiple “species” in a single sample of eDNA



Ongoing risks to forests

AUSTRALIAN FORESTRY Volume 85(4)
<https://doi.org/10.1080/00049158.2022.2142373>

Forest health and biosecurity in a changing world

- Changing climate
- Increasing pest risk
 - Nahrung & Carnegie papers
- Declining capacity

