



NIFPI NS033

NIFPI: Innovative Forest Health and Biosecurity for the GT

September 2020 Newsletter

Project Overview

Two key components of this project are:

- Part A: Calibrated Pest spread models for the broader GT
- Part B: Implementation of a cooperative forest health and biosecurity surveillance system

Introducing our Agriculture Victoria team members delivering Part A of the project; Dr John Weiss, Anna Weeks and Dr Kathryn Sheffield. This newsletter provides an introduction/overview to the team, their contribution to the industry and the project.

Project Update

Part A: Calibrated Pest spread models for the broader GT

Agriculture Victoria has developed a spatially explicit species spread model that combines fine meteorological data, host location data, life-cycle models and dispersal/wind models for greater the Melbourne region of Victoria. The model has potential to be used as a decision support tool for forest health managers designing surveillance and monitoring activities.

Part A consists of the following outcomes;

1. Calibrate the Agriculture Victoria model to the broader GT region and further develop it as a decision tool for forest health managers.
2. Document and develop an understanding of the potential for imminent pests (e.g. Asian Gypsy Moth) to spread through the GT under a range of introduction scenarios allowing the quantification of the economic impacts on growers, processors and the broader GT economy.

The industry is very fortunate to have an experienced modelling team delivering the pest species modelling component of this project. The team of researchers previously worked together on Modelling the Incursion and Spread of the Forestry Pest: *Monochamus alternatus* Hope (Coleoptera: Cerambycidae) in Victoria (the baseline model of which this project is an extension).



Photo: John Weiss

Dr John Weiss is a Senior Research Scientist in the Agriculture Victoria Research Division.

John comes to the project with over 30 years of knowledge in invasive species; including integrated management, weed risk analysis and predictive modelling of weed and plant pests.

John is collating key species information of the chosen exotic species selected by industry which include; (Figure 1)

- Asian and European Gypsy moth (*Lymantria dispar*)
- Pine shoot beetle (*Tomicus piniperda*)
- Pine pitch canker (*Fusarium circinatum*)
- Myrtle rust (*Puccinia psidii*)

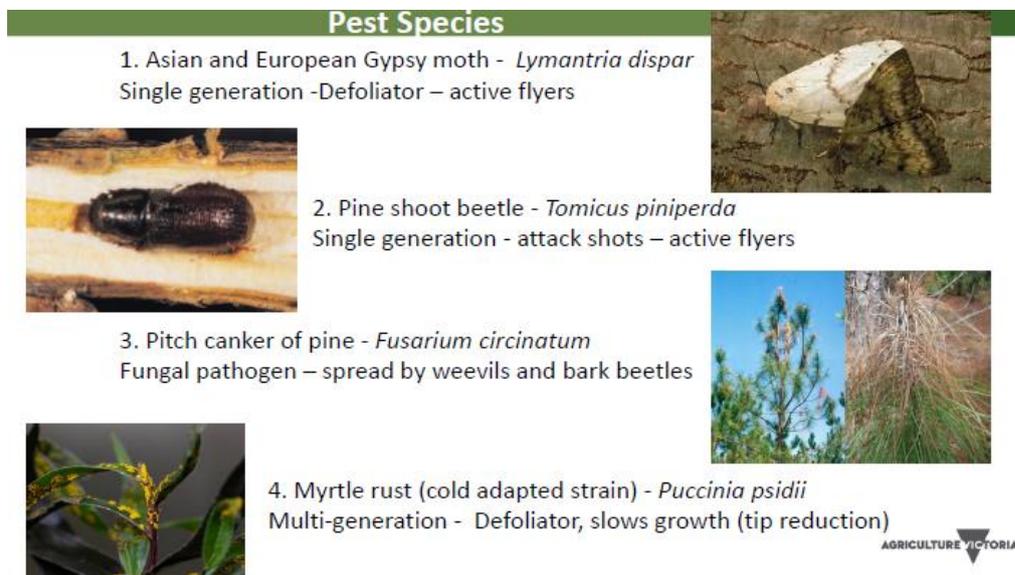


Figure 1: Exotic pest modelling species

Anna Weeks is a Systems modeller within the Agriculture Research and Development Division of Agriculture Victoria.

Anna's is involved in a range of research in Water Science; Streamflow models and Catchment Analysis tools. Environmental Science; Climate change scenario modelling and Land use change and recently together with John Weiss and Kathryn Sheffield in Agriculture Plant Science to model the incursion and spread of a forestry pest within Victoria.

Anna is working on building and developing the model and specifically the Tree health, growth and biomass production and the Dispersal Kernels (Figure 2).



Photo: Anna Weeks

Tree health, growth and biomass production

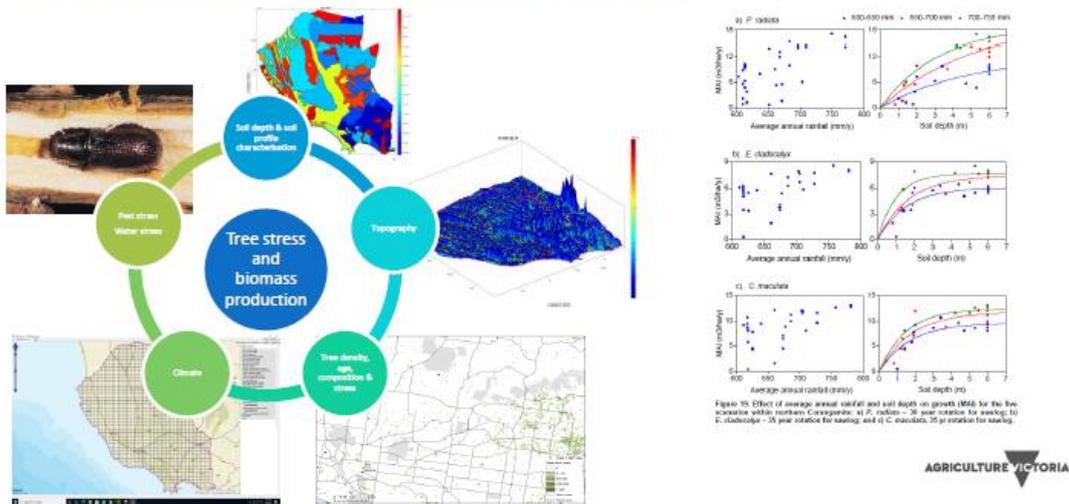


Figure 2: Tree health, growth and biomass production



Photo: Kathryn Sheffield

Kathryn Sheffield is a Research Scientist – Remote Sensing within Agriculture Victoria Research.

Kathryn is skilled in a range of areas across Agriculture using Remote Sensing and Geographical information Systems.

Specialising in Satellite and Aerial imagery, Satellite Remote Sensing, NDVI, Sentinel 2 Imagery datasets to assess Water, Land use, Crops, Irrigation, Evapotranspiration.

Kathryn has been working on collecting and constructing datasets required for the model (Figure 3).

Overview of spatial datasets

- Utilised by a number of project components including modelling and surveillance
- Key datasets:
 - Vegetation characteristics
 - Dispersal vectors
 - Pest entry and sources
 - Ancillary data
- Data at a range of spatial and temporal scales are integrated and manipulated to generate these key datasets
- Scalability of datasets: plantation blocks to regional assessments



Figure 3: Overview of spatial datasets

We look forward to a seminar later this year to hear from the experts themselves on the Pest Species Model. The team will be reporting on modelling outcomes with milestone outcomes scheduled and on track for October 2020.

