Risk assessment approaches for log exports

S. Pawson, C. Romo, N. Meurisse, M. Bader, E. Brockerhoff

O. Woodberry and A. Nicholson

Key funding agencies

- Stakeholders in Methyl Bromide Reduction – Ian Gear (Funding $550K p.a.)
- Ministry for Business, Innovation, and Employment ($1.3 m p.a.)
- Scion (Core funding $210k p.a.)

Collaborators

- Plant and Food Research – Don Brash
- University of Canterbury – EPECentre
- Bayesian Intelligence – Ann Nicholson/Owen Woodberry

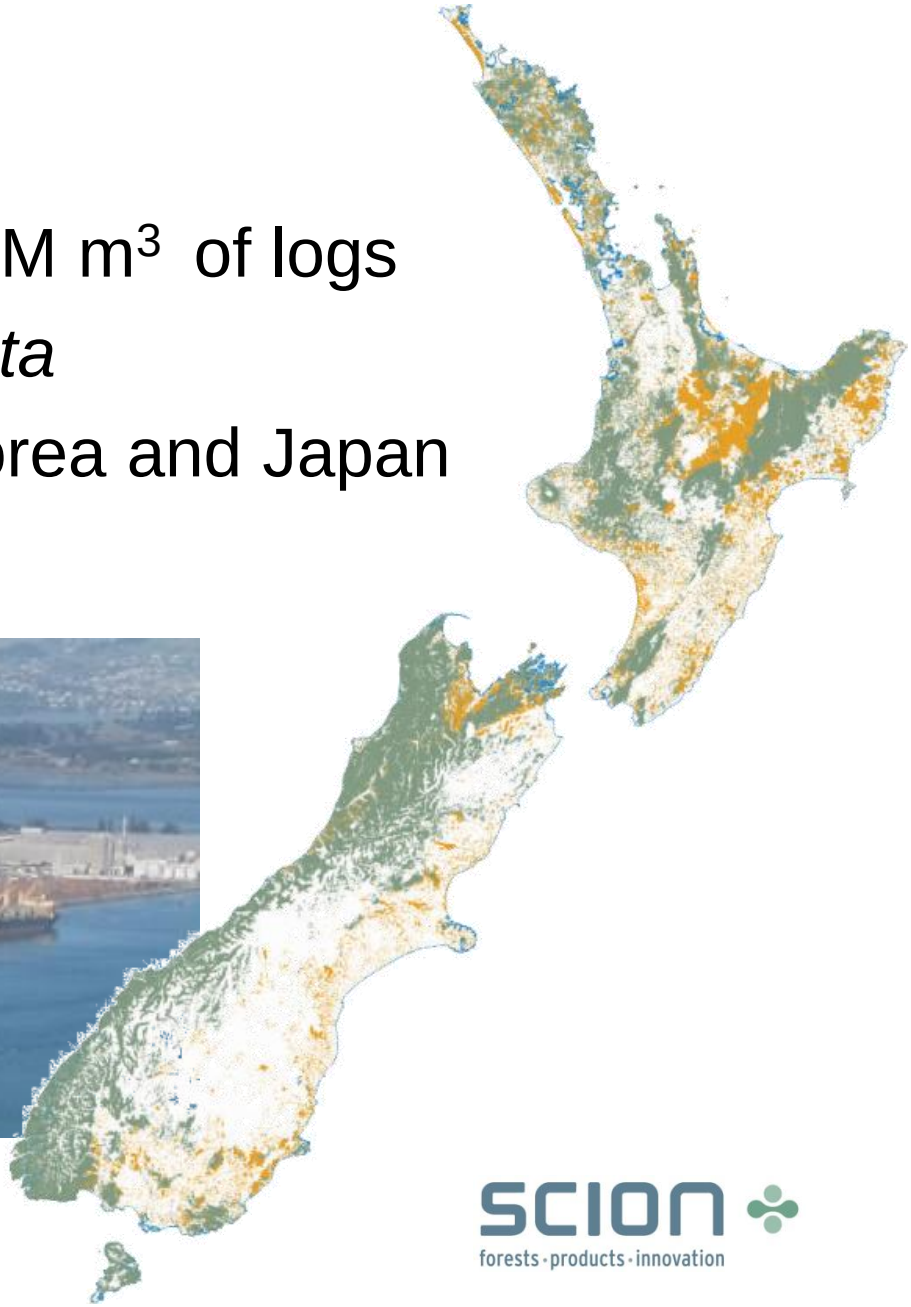
Acknowledgements

- Forest Owners Association – Glen Mackie
- Ministry for Primary Industries – Ivan Velkjovic

SCION
forests · products · innovation

What is the situation?

- New Zealand exports > 12M m^3 of logs
- Predominantly *Pinus radiata*
- Largely to China, India, Korea and Japan

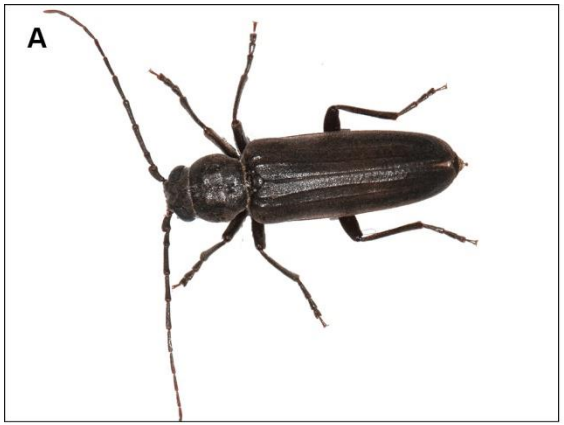


SCION
forests · products · innovation

What is the problem?

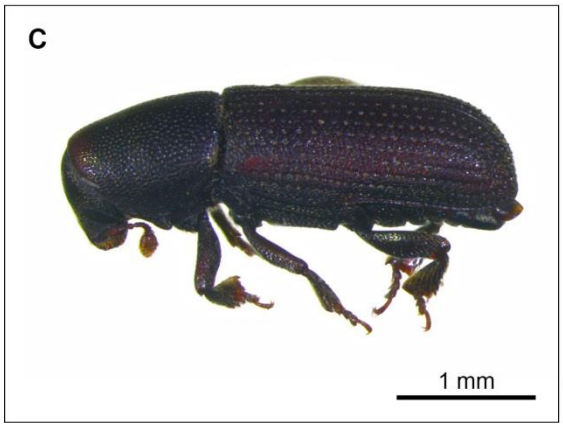
- Four key high risk phytosanitary pests in NZ.

Arhopalus ferus



Prionoplus recticularis

Hylastes ater



Hylurgus ligniperda

Sirex noctilio is considered a low risk pest, however it is of concern to trading partners.

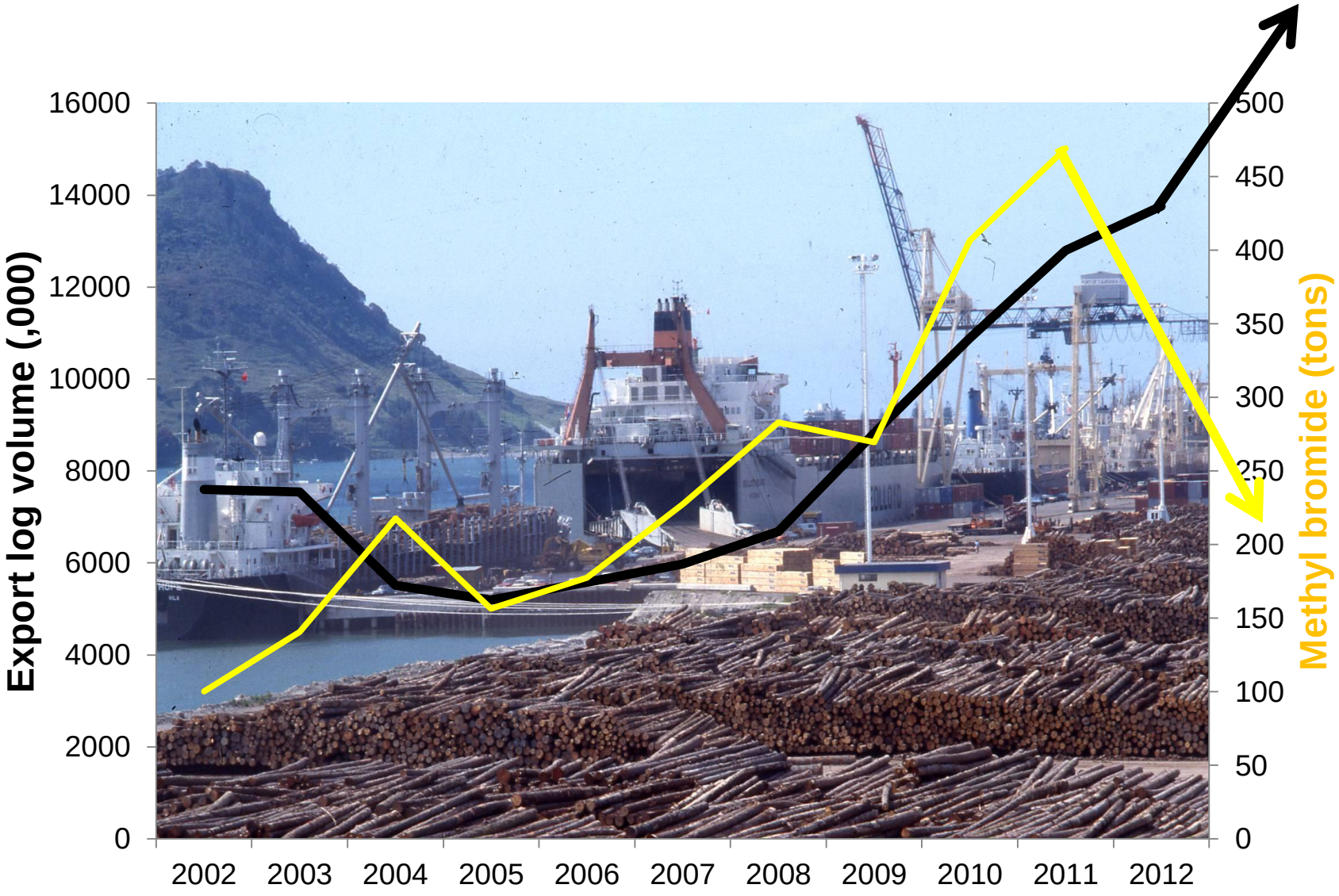
SCION
forests · products · innovation

How do we currently mitigate the risk?

- Our trading partners require us to treat logs prior to export:
  - Methyl bromide is an accepted treatment
  - Debarking and heat are accepted in some markets, but current methods are not cost effective.
  - Phosphine is allowed for the Chinese market under an experimental use permit.

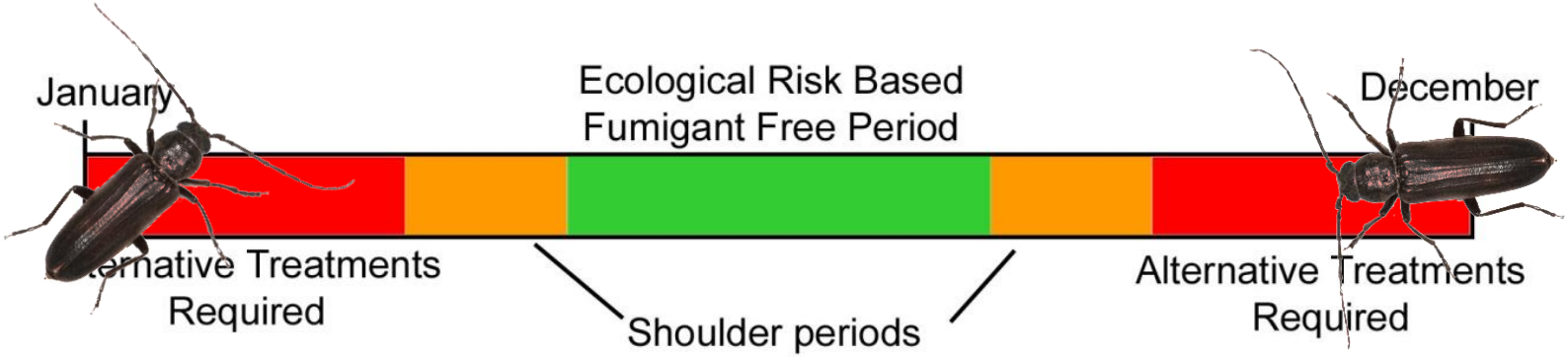
SCION
forests · products · innovation

How to reverse the trend in MeBr use?



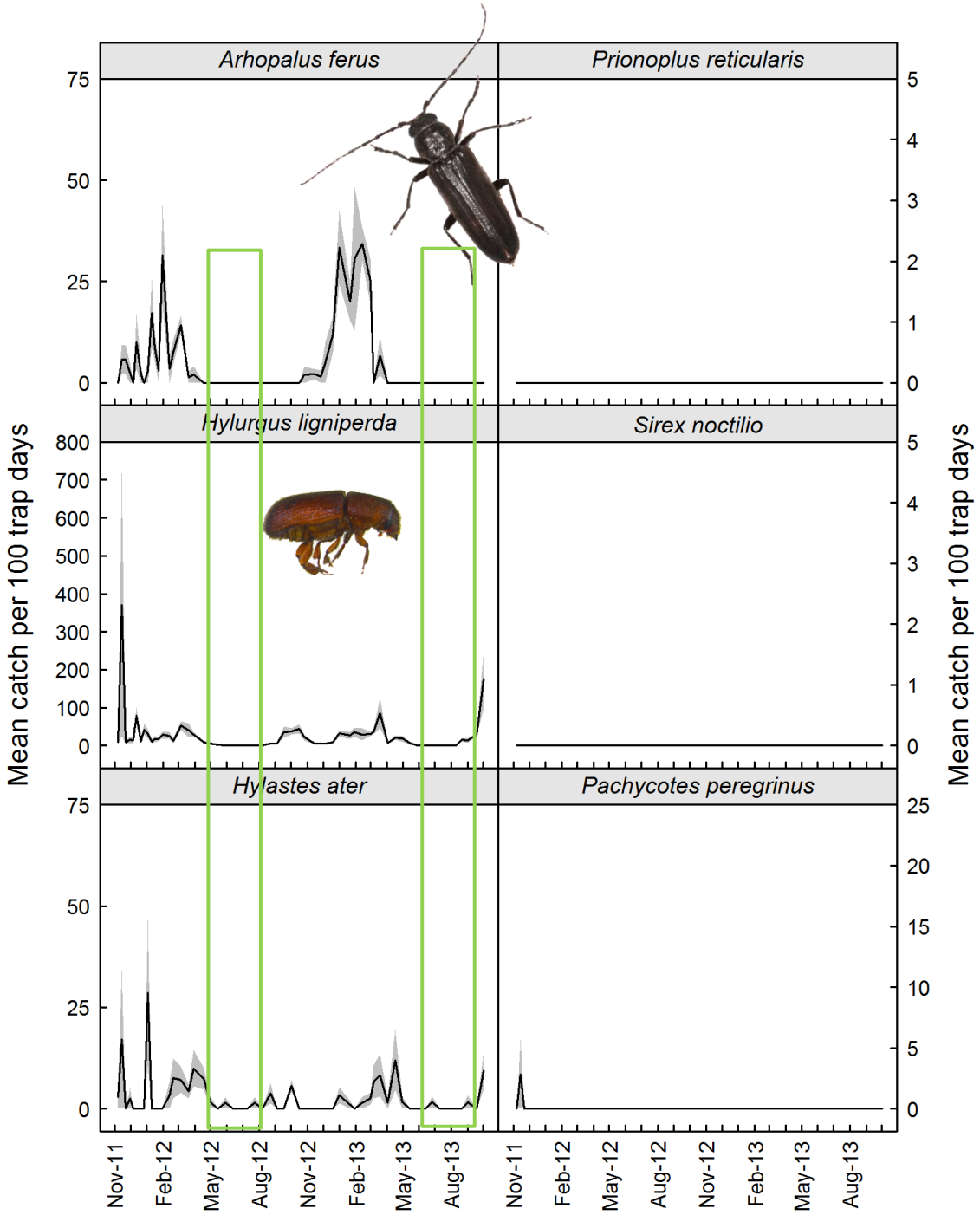
Our proposed new paradigm

Only treat commodities when a phytosanitary risk is present



Integrated Phytosanitary Pest Management

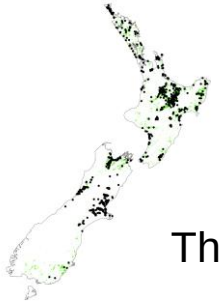
SCION
forests · products · innovation



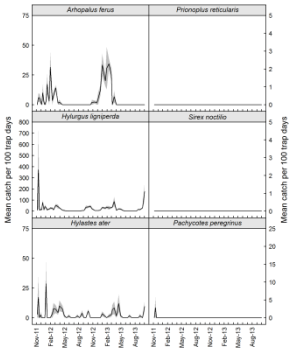
SCION
forests · products · innovation

Integrated Phytosanitary Pest Management (IPPM)

Pest complex and its distribution



Thermal development models



Landscape context
-Amount of plantation
-Age of source material

Dispersal
- How far they fly
- Conditions required for flight
- Time of day

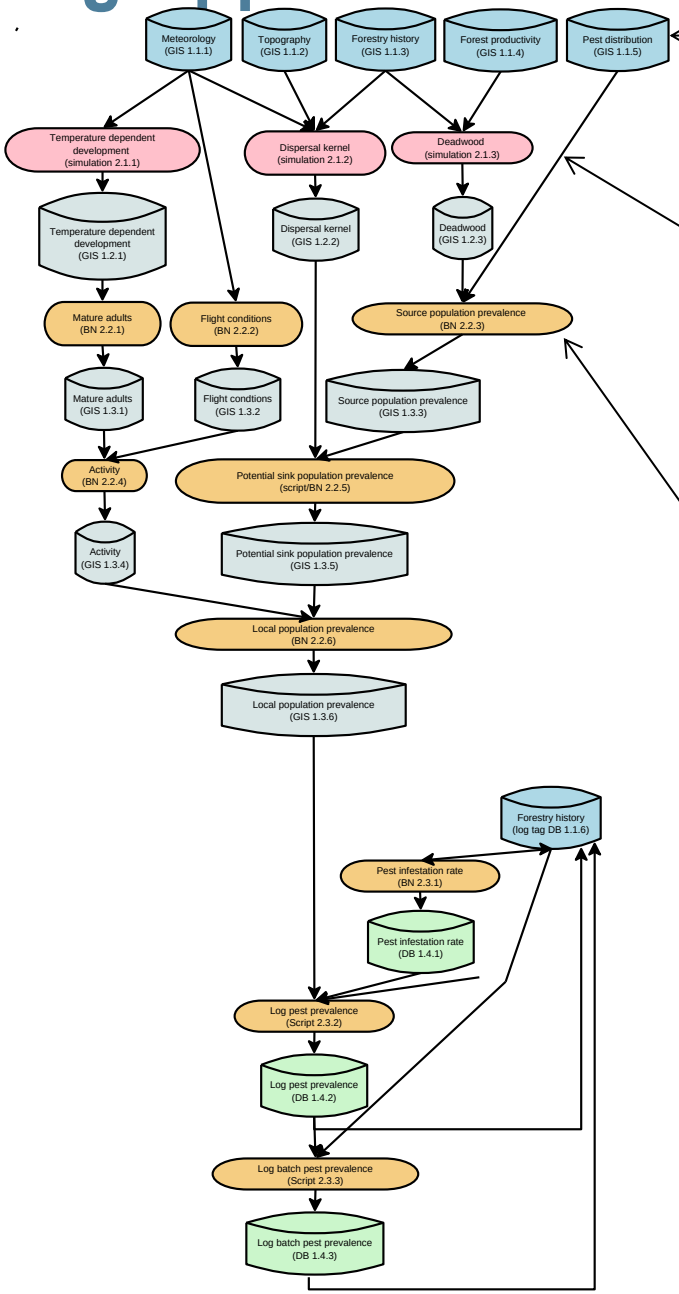
Pest Pressure at a given time and at a given place, e.g., Harvest area

Reduce reinfestation

Probability of infestation
Do we treat – fumigate or heat etc

SCION
forests · products · innovation

Modelling Approach

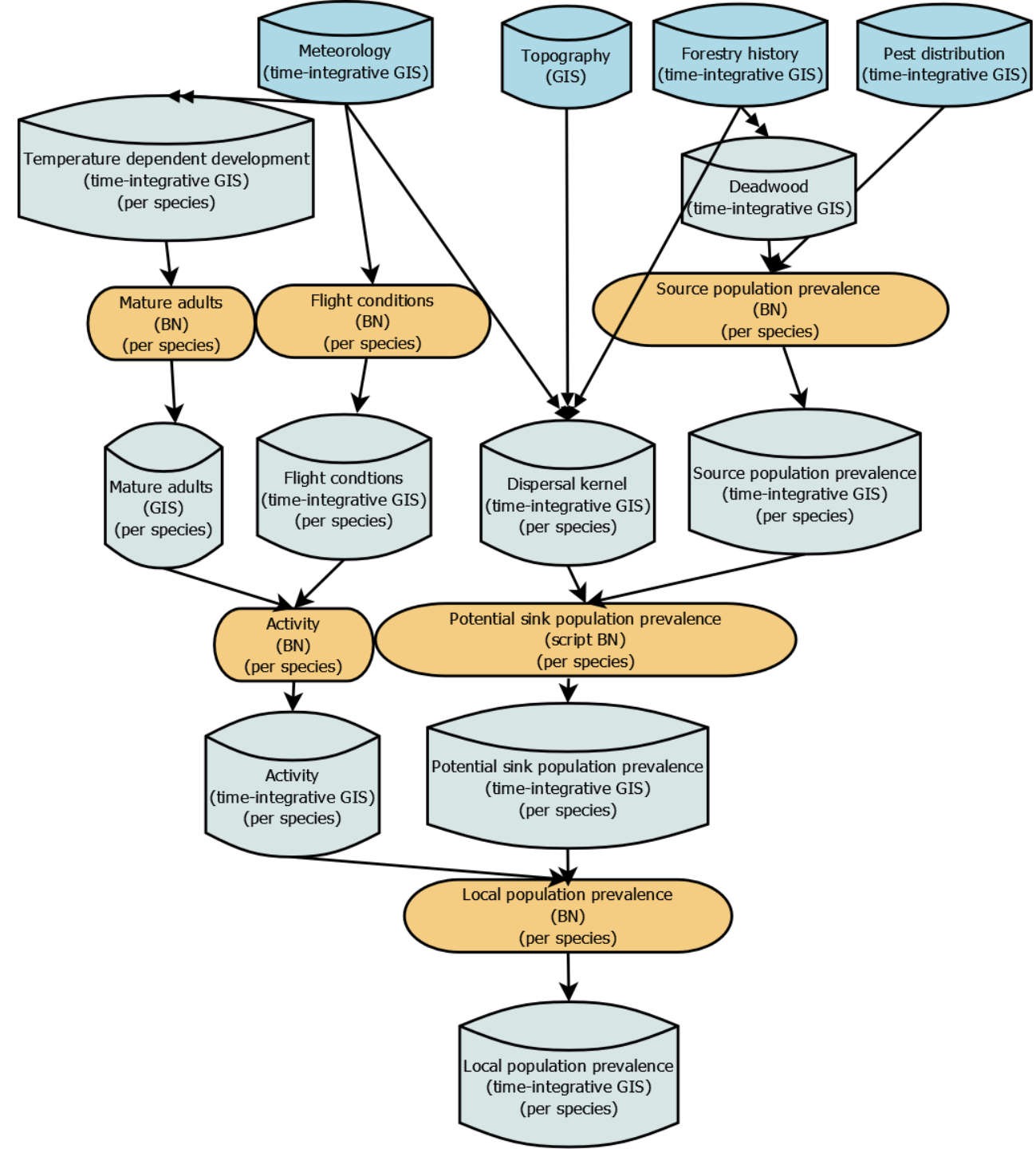


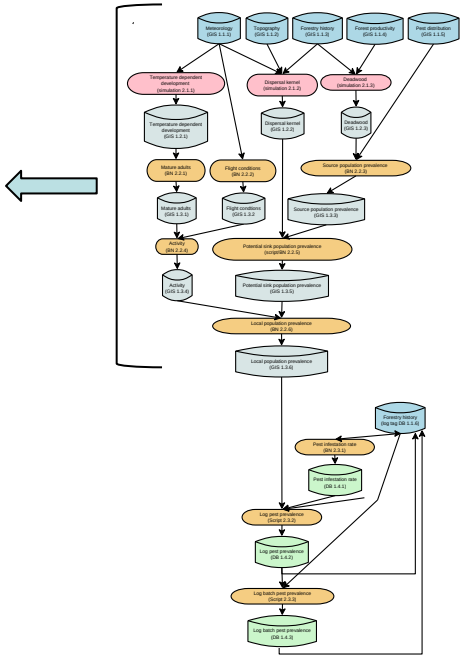
GIS interfaces/databases in blue

Simulations in pink

BNs

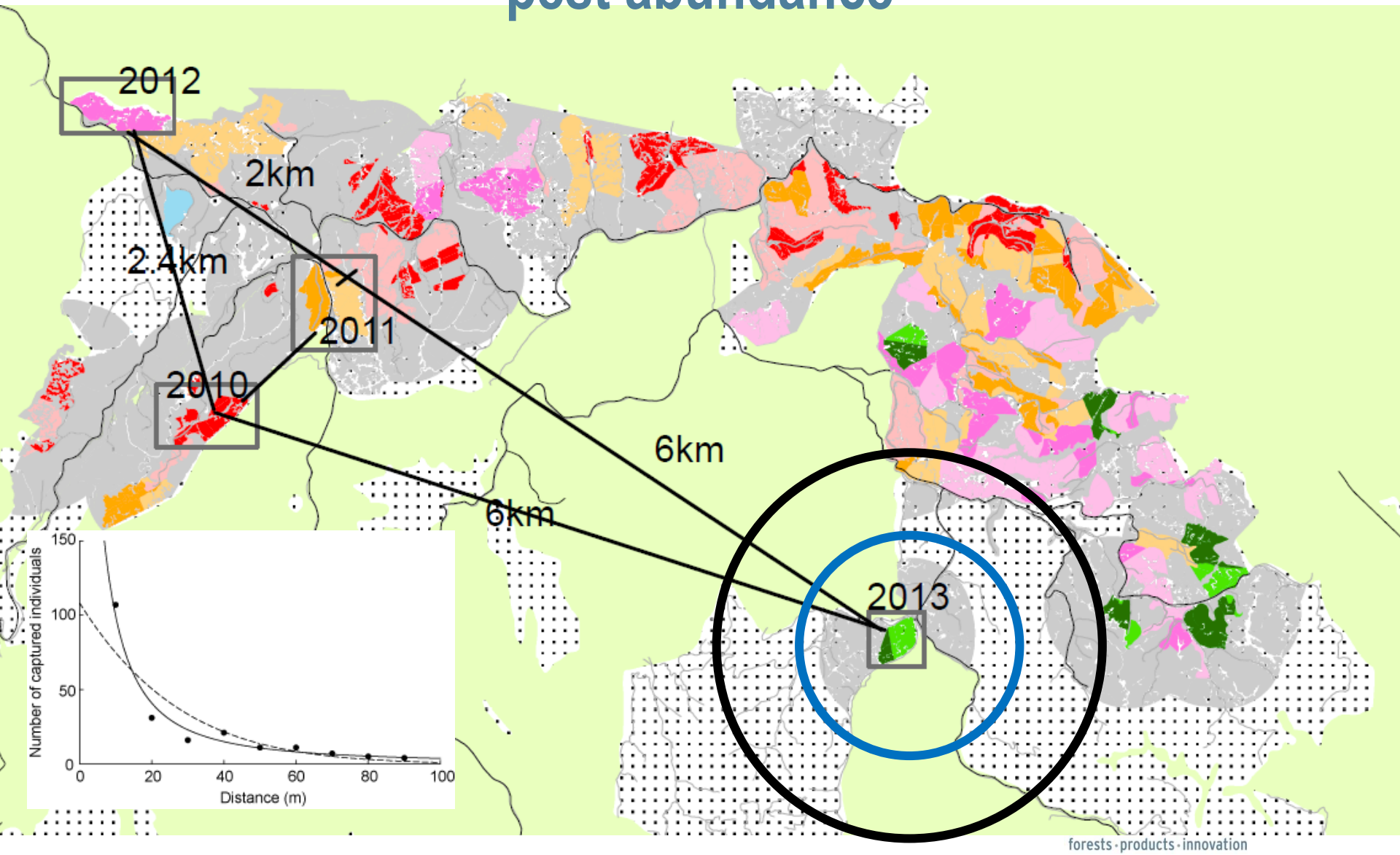
SCION
forests · products · innovation

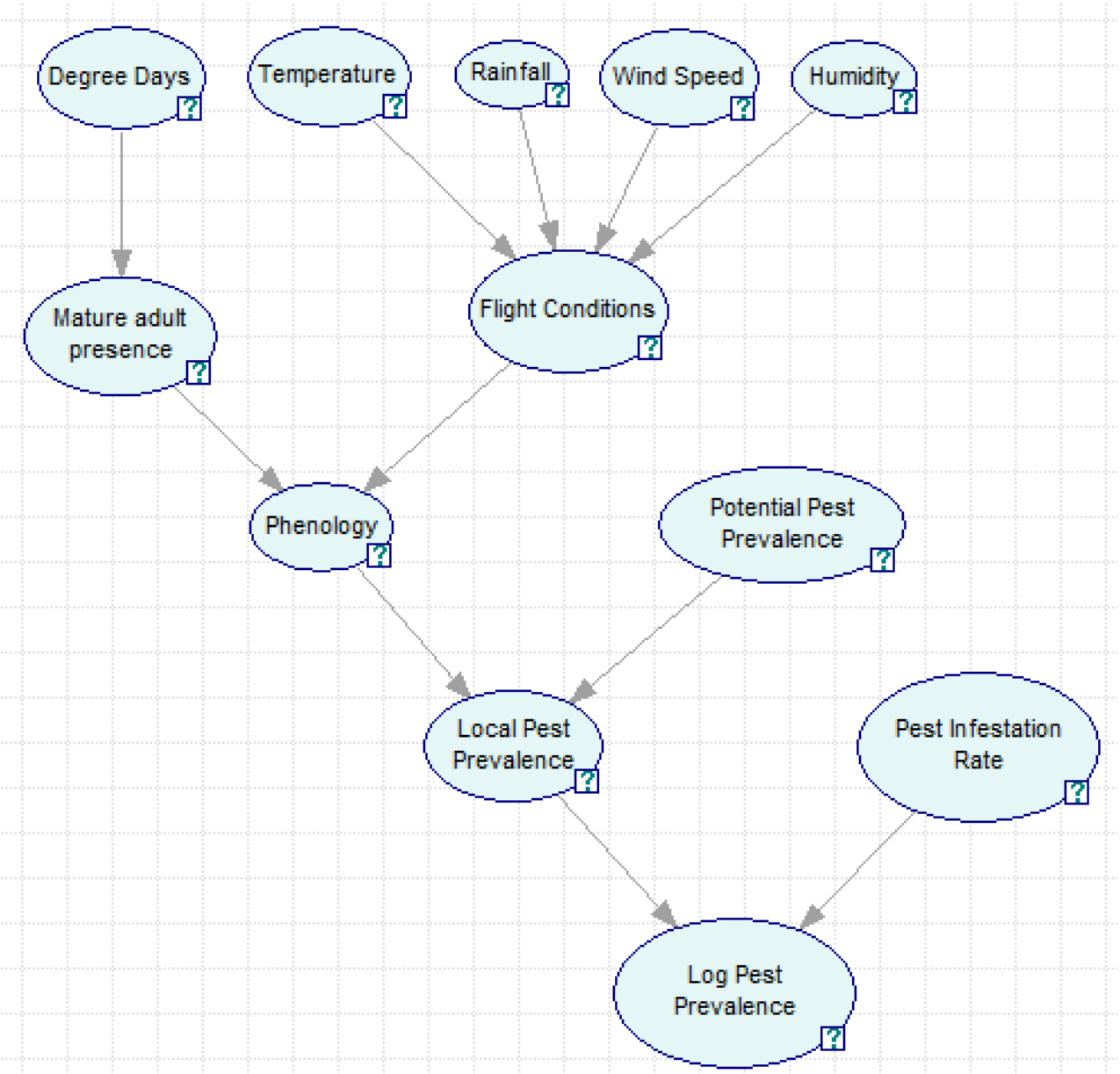




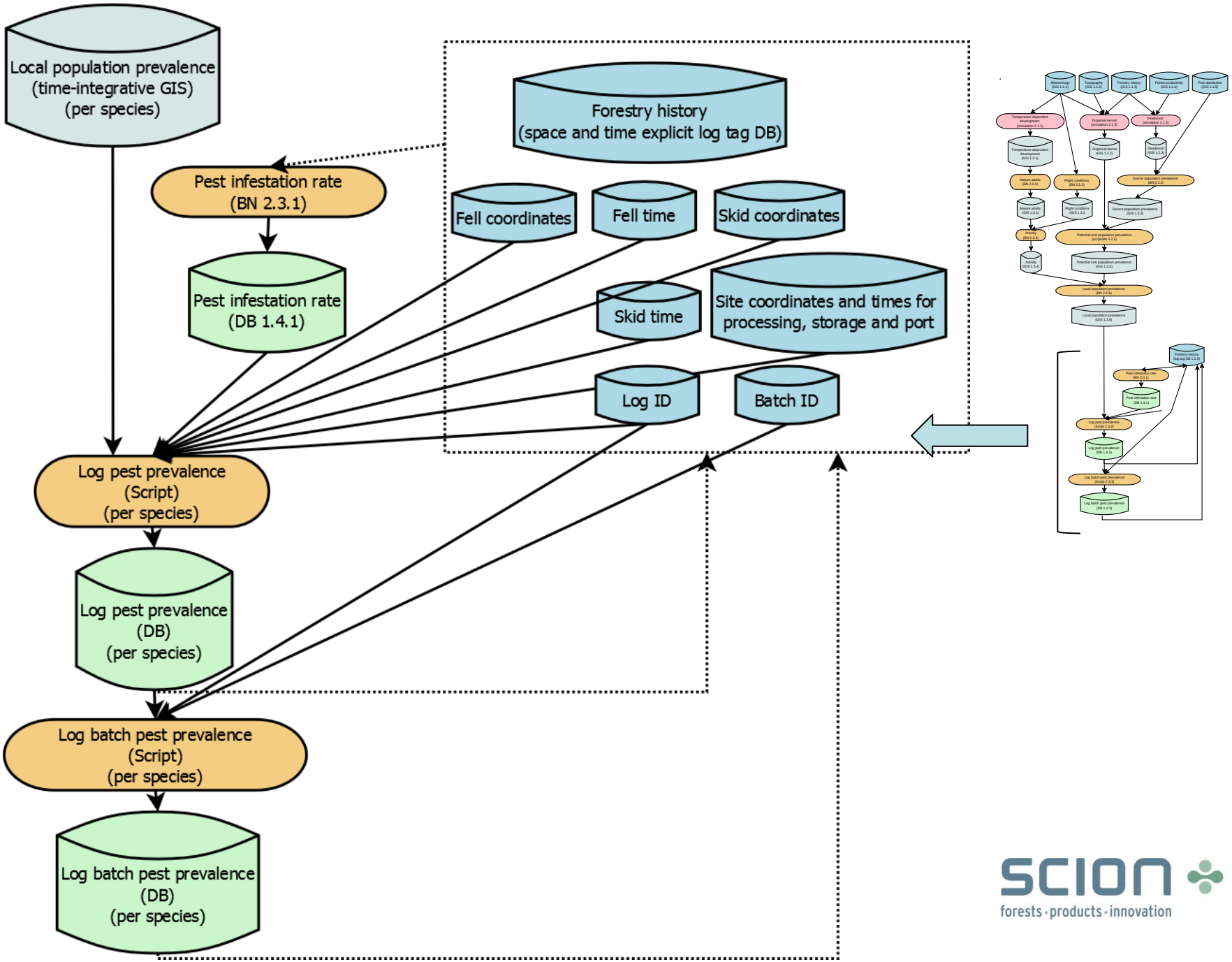
scion
forests · products · innovation

Deadwood simulation and dispersal to characterise pest abundance

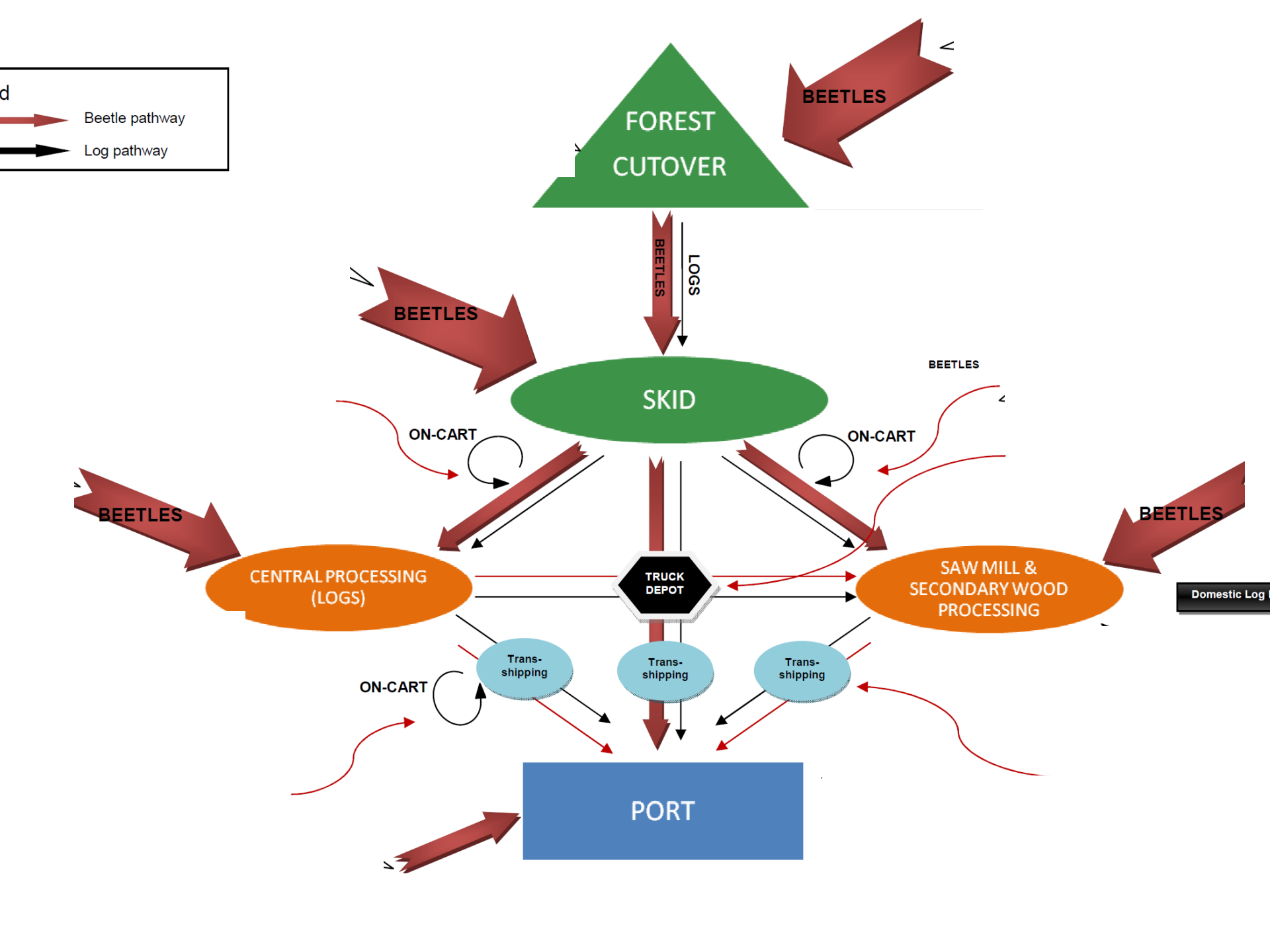




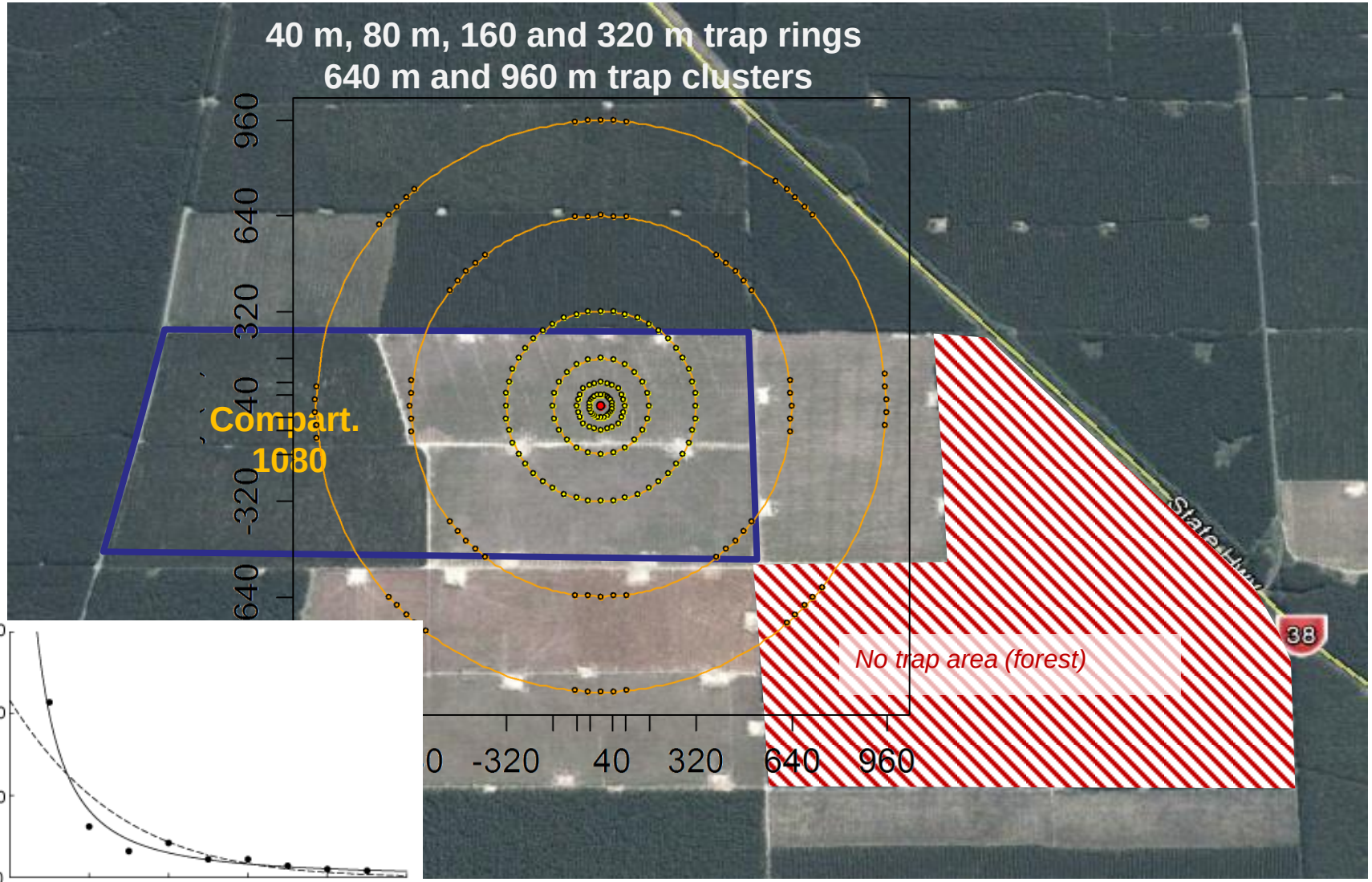
SCION
forests · products · innovation

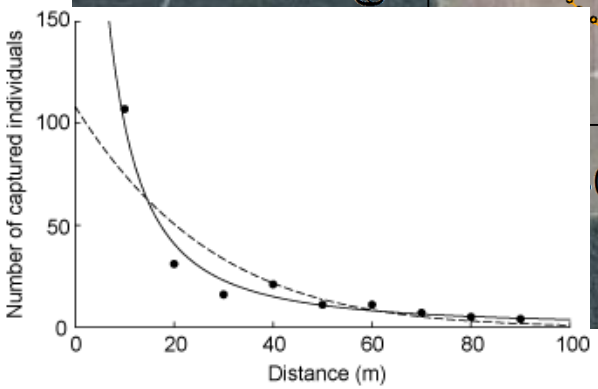


scion
forests · products · innovation


d
Beetle pathway
Log pathway
FOREST
CUTOVER
BEETLES
BEETLES
LOGS
BEETLES
SKID
BEETLES
ON-CART
ON-CART
BEETLES
BEETLES
CENTRAL PROCESSING
(LOGS)
TRUCK
DEPOT
SAW MILL &
SECONDARY WOOD
PROCESSING
Domestic Log
Trans-
shipping
Trans-
shipping
Trans-
shipping
ON-CART
PORT

How will we define dispersal kernals

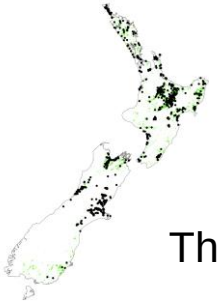




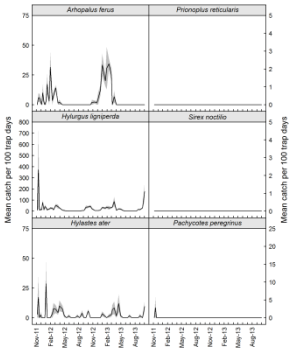
Log logistics, how to track a log?

The Future

Pest complex and its distribution



Thermal development models



Landscape context
-Amount of plantation
-Age of source material

Dispersal
- How far they fly
- Conditions required for flight
- Time of day

Pest Pressure at a given time and at a given place, e.g., Harvest area

Reduce reinfestation

Probability of infestation
Do we treat – fumigate or heat etc

SCION
forests · products · innovation

The future

January
Ecological Risk Based
Fumigant Free Period
December
Alternative Treatments
Required
Shoulder periods
Alternative Treatments
Required