



Manaaki Whenua
Landcare Research

Possums & Pines



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Relevant Research

Theses

- M. Clout. 1977: Ecology of the possum in *P. radiata* plantations (Kinleith) PhD.
- A. Keber, 1988: An enquiry into the economic significance of possum damage in an exotic forest (Tauhara) PhD.
- B. Warburton. 1977: Ecology of the brushtail possum in an exotic forest (Ashley) MSc.

Papers:

- Warburton, B. 1978: Foods of the Australian brush-tailed possum in an exotic forest (pine pollen cones major component of diet in late winter)

Relevant Research

Reports:

Griffiths, A. 1985: Economics of wild animal control/management in production forests.

Spurr, E.B., Coleman, J.D. 2002: Long-term trends in bird populations under existing forest management practices Landcare Research contract report for Fletcher Challenge Forests.

Warburton, B., Poutu, N. 2002: Development of a kill-trap system for maintenance control of possums in exotic production forests. Landcare Research contract report for Fletcher Challenge Forests.

Coleman, M. Coleman, J.D. 2003: Fate of possums following clear-felling of exotic forest. Landcare Research contract report for AHB.

Payton, I., Frampton, C. 2003: Canopy indicator assessment: A method for monitoring brushtail possum damage to pine plantations (contract to the Forest Health Research Collective)

Various forest health reports.



Predicting damage

Clout: Damage primarily in young stands in winter and spring
– response to poor nutrition.

Keber: Damage associated with slash disposal.

Damage includes:

- Crown barking
- Basal barking
- Broken leaders
- Broken laterals

**Damage is patchy both in
space and over time
– therefore difficult to
predict**

Forest Health reports – current problem ????

Predicting damage

What is needed?

Actual

Need for
control

No need for
control

Need for
control

No need for
control

Survey



Predicting damage

Actual

Need for
control

No need for
control

Need for
control

Carry out control
when necessary

Carry out control when
not necessary

P

P

No need
for control

Do not carry out
control when
necessary

Do not carry out
control when not
necessary

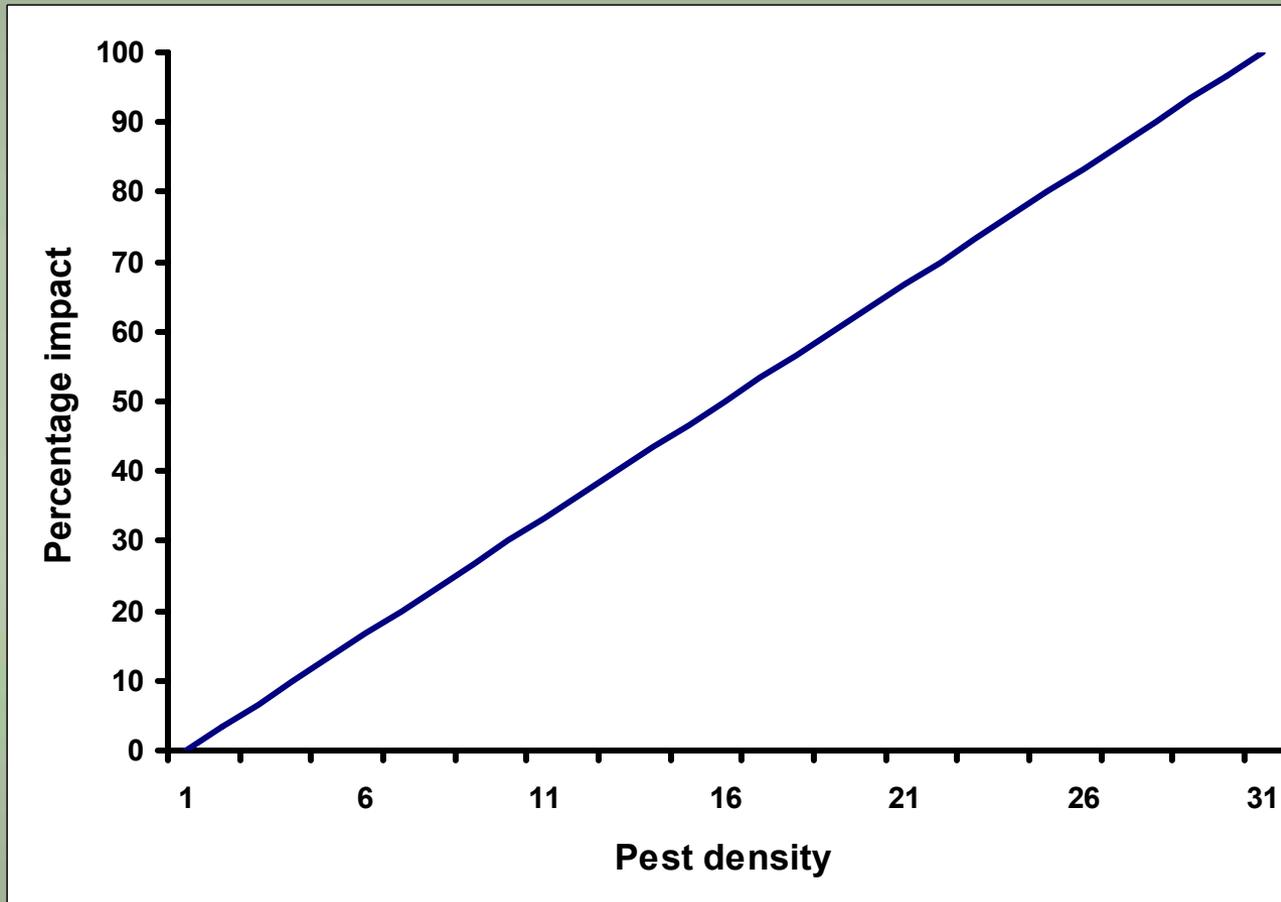
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**Survey
or
knowledge**

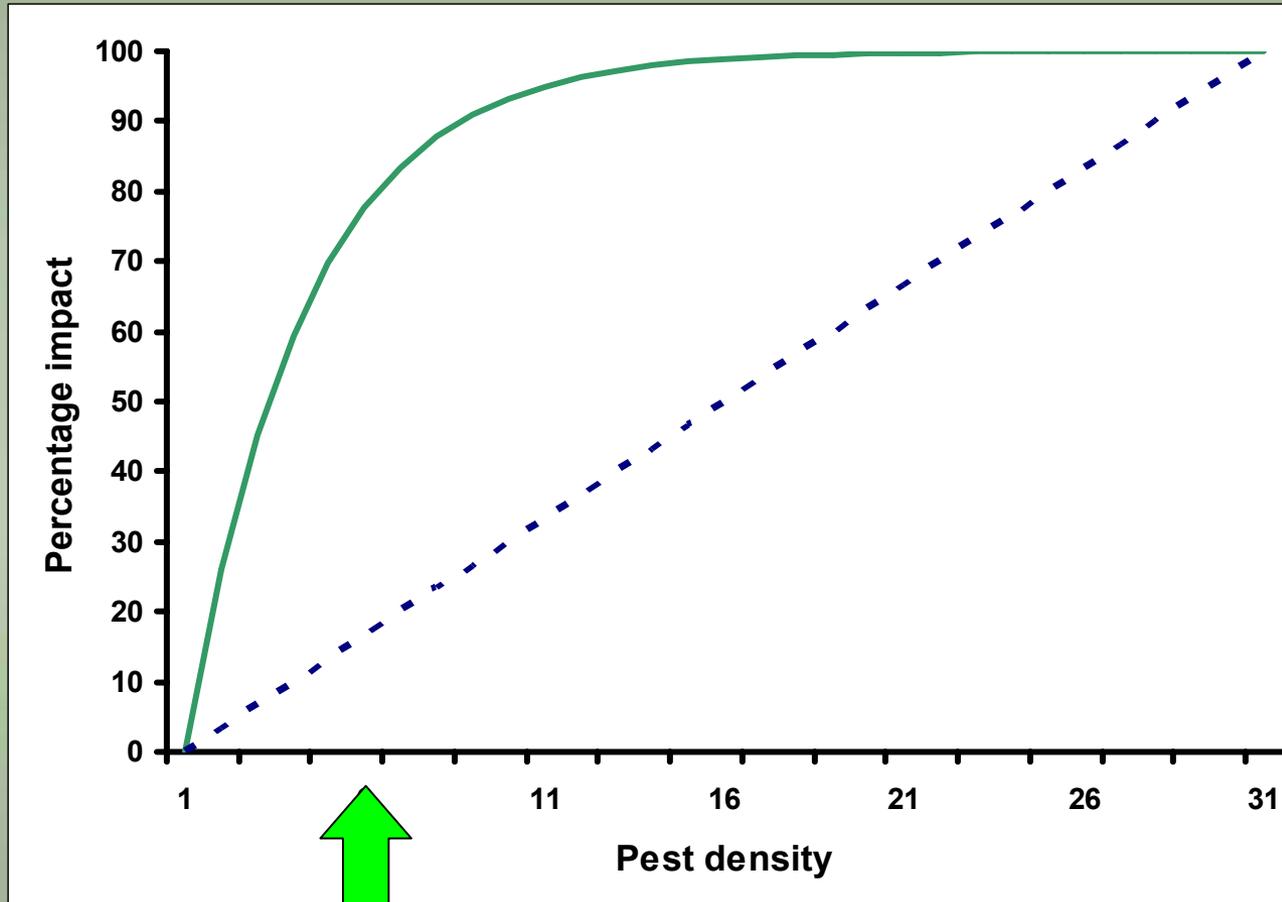


Relationship between Pest Density and Impact



Linear relationship: Less pests means less impact

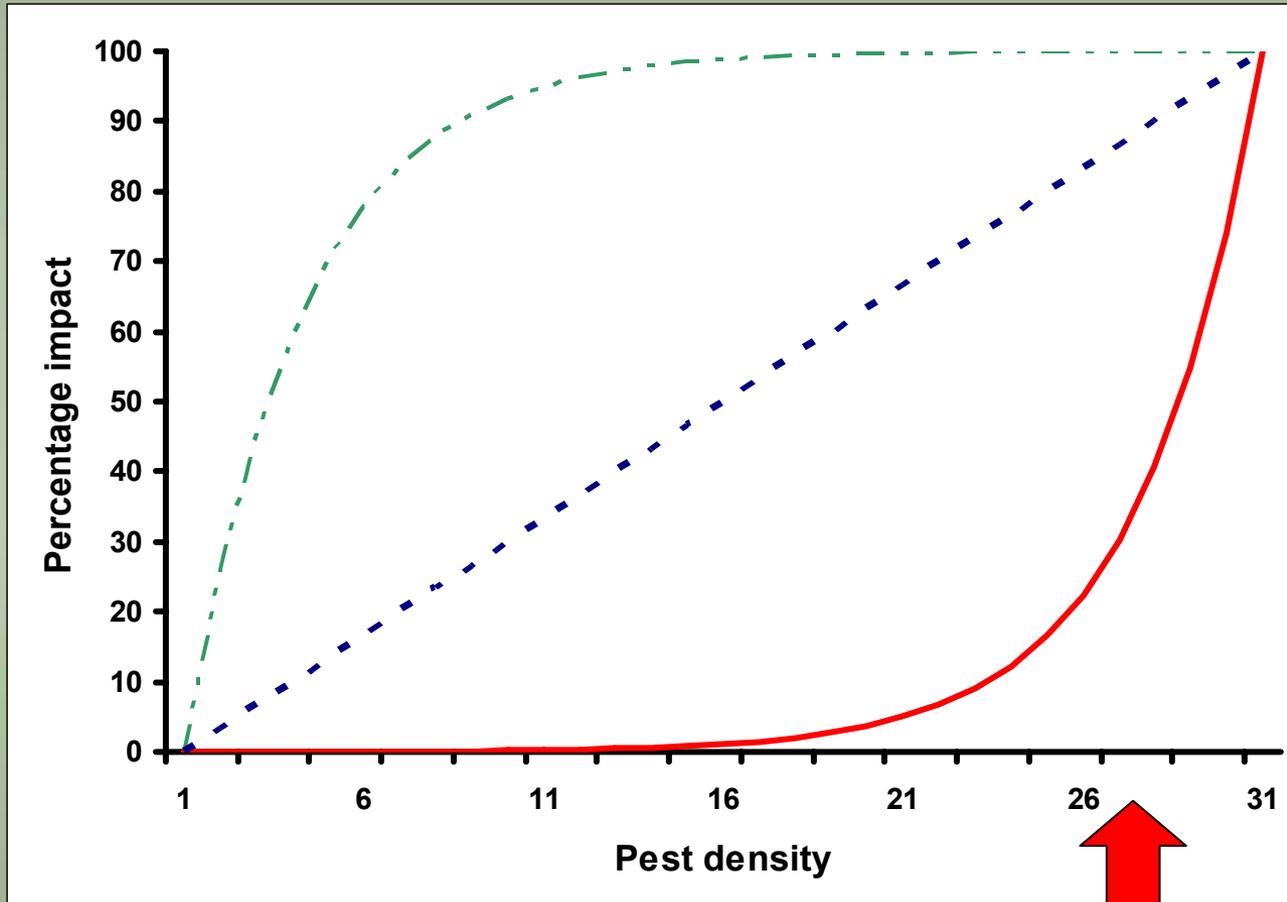
Relationship between Pest Density and Impact



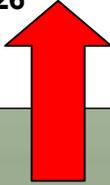
Control \$\$ wasted

Thresholds (e.g. Bovine Tb, fuchsia, kereru)

Relationship between Pest Density and Impact



Control \$\$ wasted



kamahi canopy



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Possum control options

Aerial

- 1080 AHB-funded control related to bovine Tb
- \$50mill spent on Tb-related possum control (includes production forests).
- AHB funded control will decline as approach Tb freedom in 2013



Ground

- Large pool of contractors available
- Feratox (cyanide) products
- Cholecalciferol products
- Anticoagulants
- Traps (leghold and kill)
- Best-practice information at: <http://possumdss.landcareresearch.co.nz>



Forest Stewardship Council

Highly hazardous chemicals

- Sodium cyanide (not potassium cyanide used in Feratox)
- Brodifacoum (can be used for human health reasons)
- Warfarin (can be used to control some exotic animals)

•Temporary exemptions:

- 1080 for control of exotic pest in NZ and Australia

Need to find non-toxic alternatives???

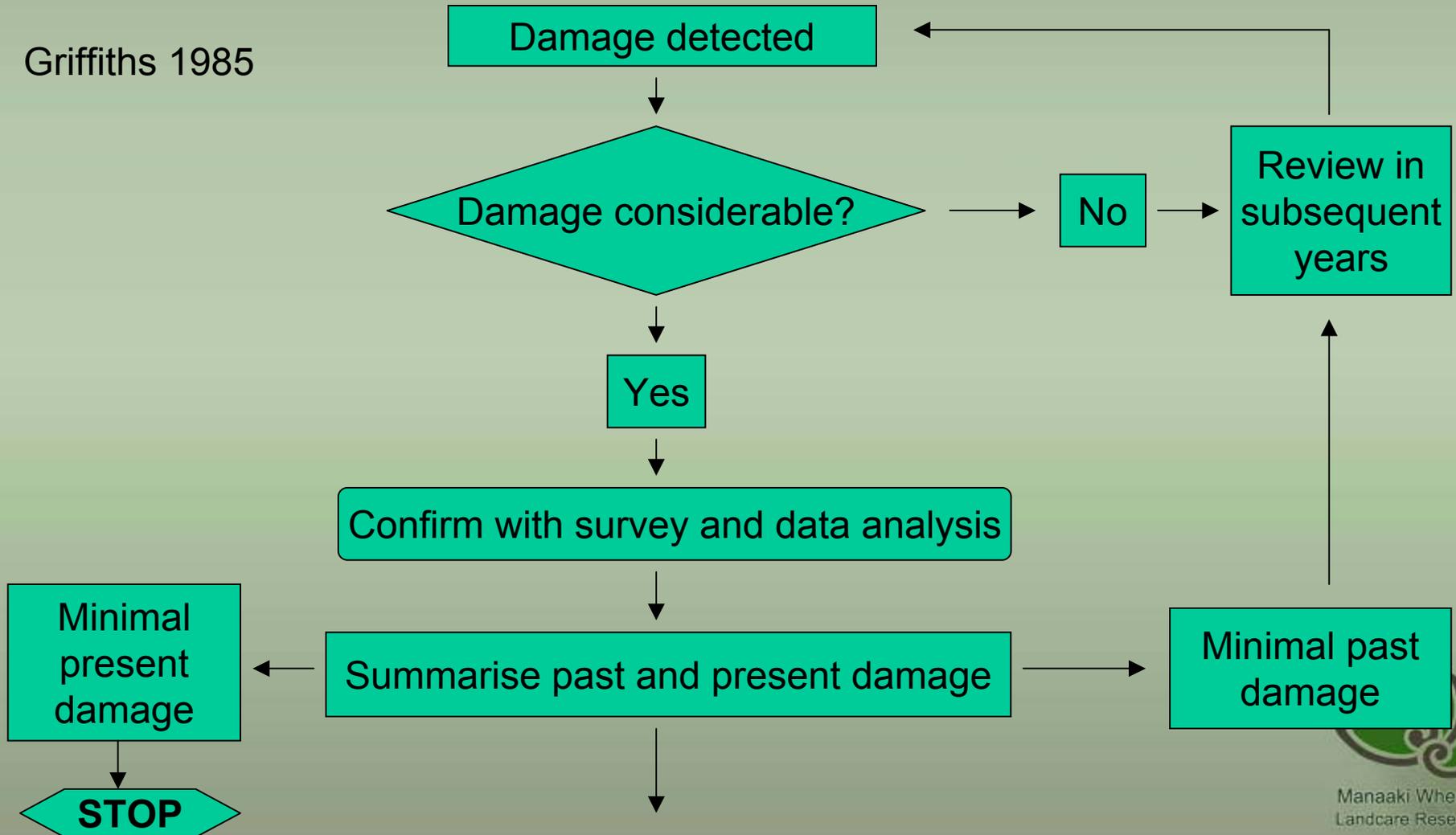
Miscellaneous

- Possum as vectors of fungal diseases ?????
- Alternative management actions might provide greater benefit-to-cost ratios than possum control (e.g. Slash management, herbicides, fertiliser use) ?????
- Stocking rates are much lower now than the 1970 & 80s – less ability to thin out damaged stock.
- Questions????

Economics

Cost-benefits of possum control

Griffiths 1985



Economics

Expected benefit from reducing damage (B)

Cost of possum control (C)

$B > C?$

No

STOP

Yes

Undertake control

Assumptions:

- Damage is proportional to density of possums
- Damage is homogenous
- Next years damage comparable to past years