Landcare Research
Manaaki Whenua

Slowing the Spread of Argentine ants in New Zealand:

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www.landcareresearch.co.nz/research/biosecurity/stowaways/index.asp

NZ ants

WARD. 2009. The diversity, community composition and seasonality of native and introduced ants (Hymenoptera: Formicidae) in northern New Zealand. Myrmecological News 12: 195-200

- very few endemic species = 10
- worker density very low

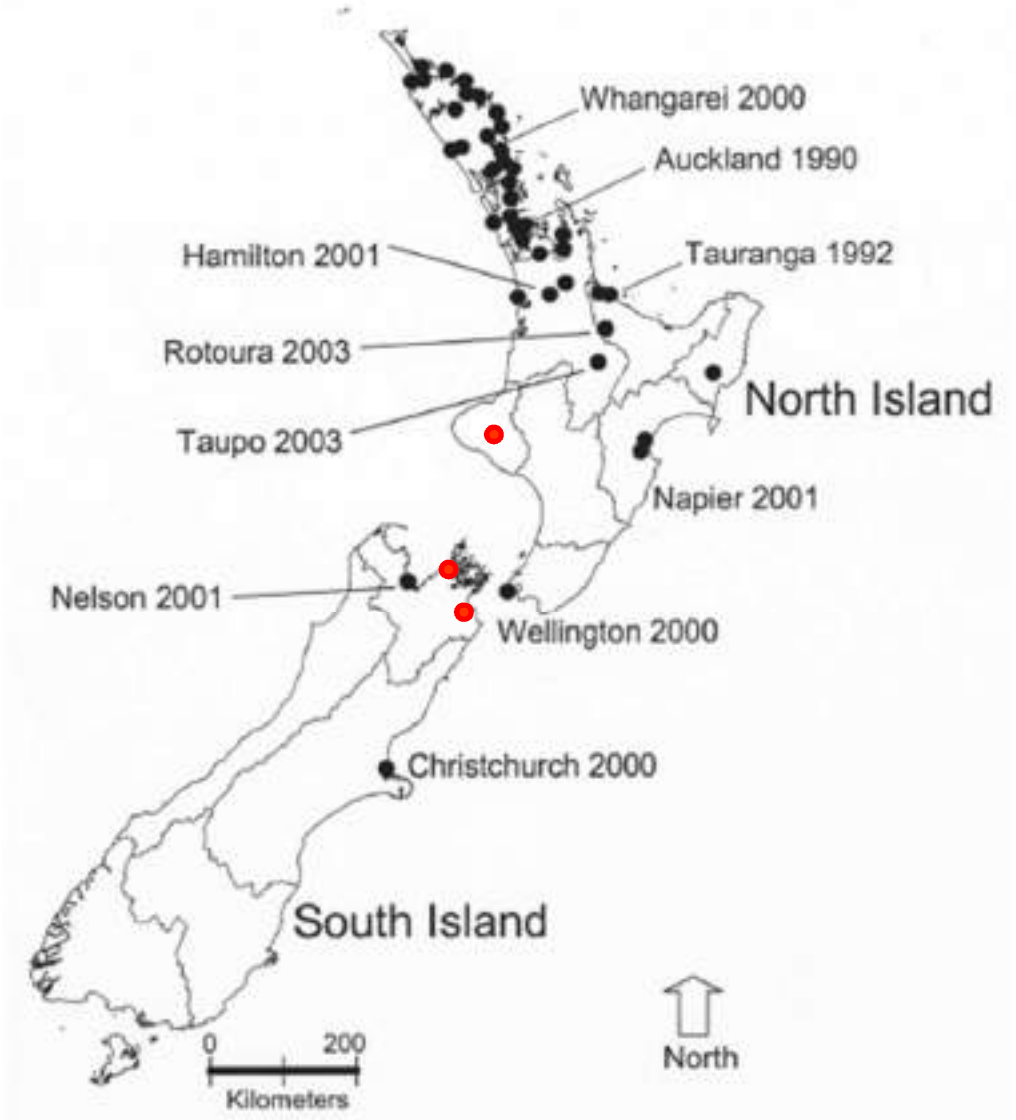
  0.215 ants per pitfall trap per day (1 ant every 5 days!)

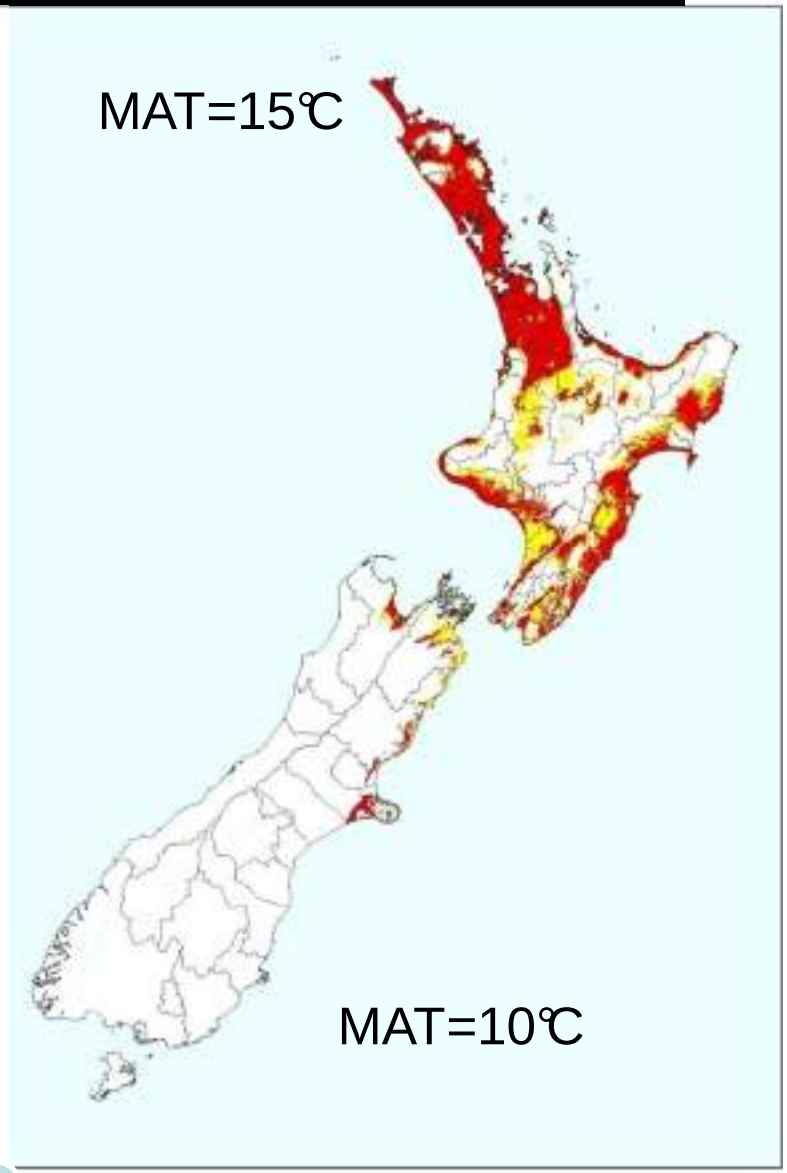
- Introduced species: 30 species, 65% native to Australia
- not “common invasive species”

<u>Absent:</u>

- Fire ants - *Solenopsis invicta, S. geminata*,
- Crazy ants - *Paratrechina vaga, P. longicornis, P. bourbonica*
- Yellow crazy ant – *Anoplolepis gracilipes*
- Little fire ant – *Wasmannia auropunctata*

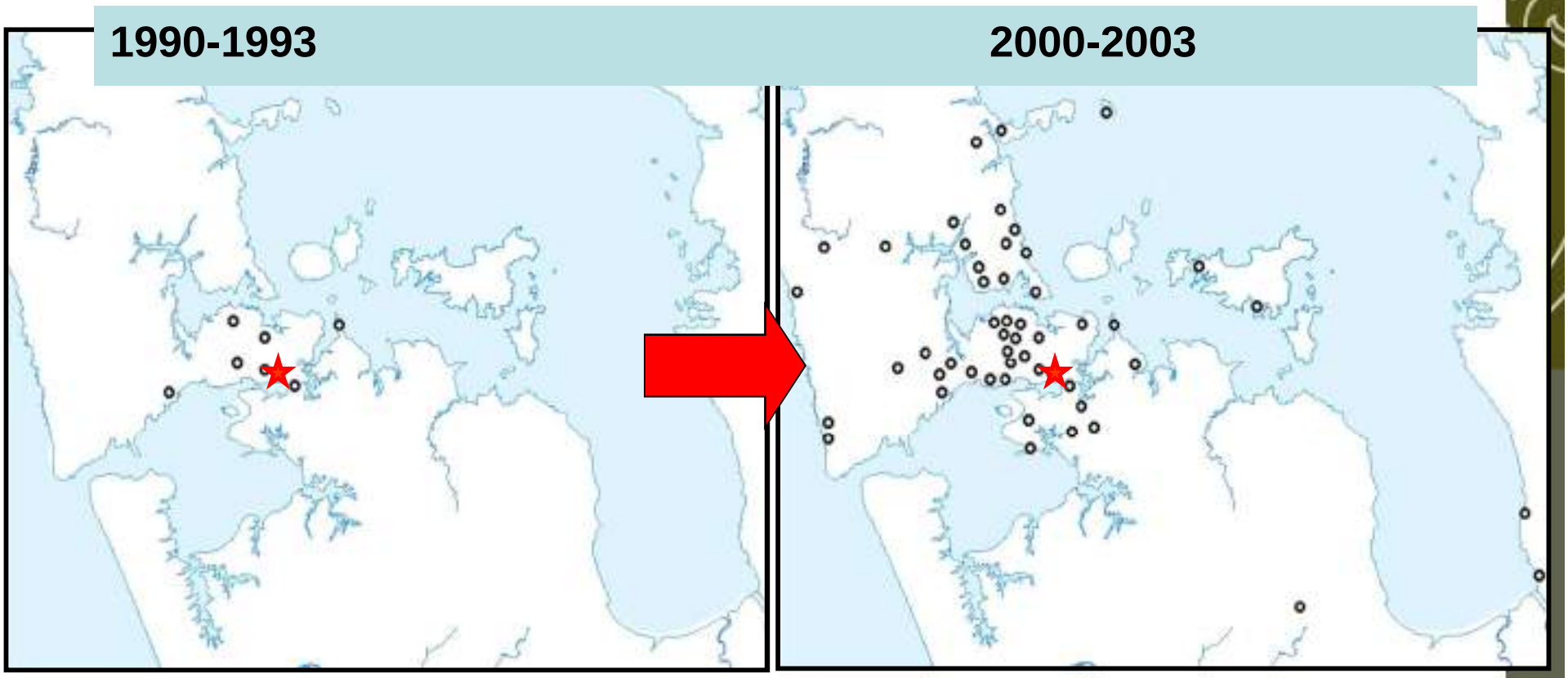
Argentine ants in NZ





Ward DF, Harris RJ, Stanley MC. 2005. Human-mediated range expansion of Argentine ants in New Zealand. Sociobiology 45 (2): 401-408.

Argentine ants in NZ

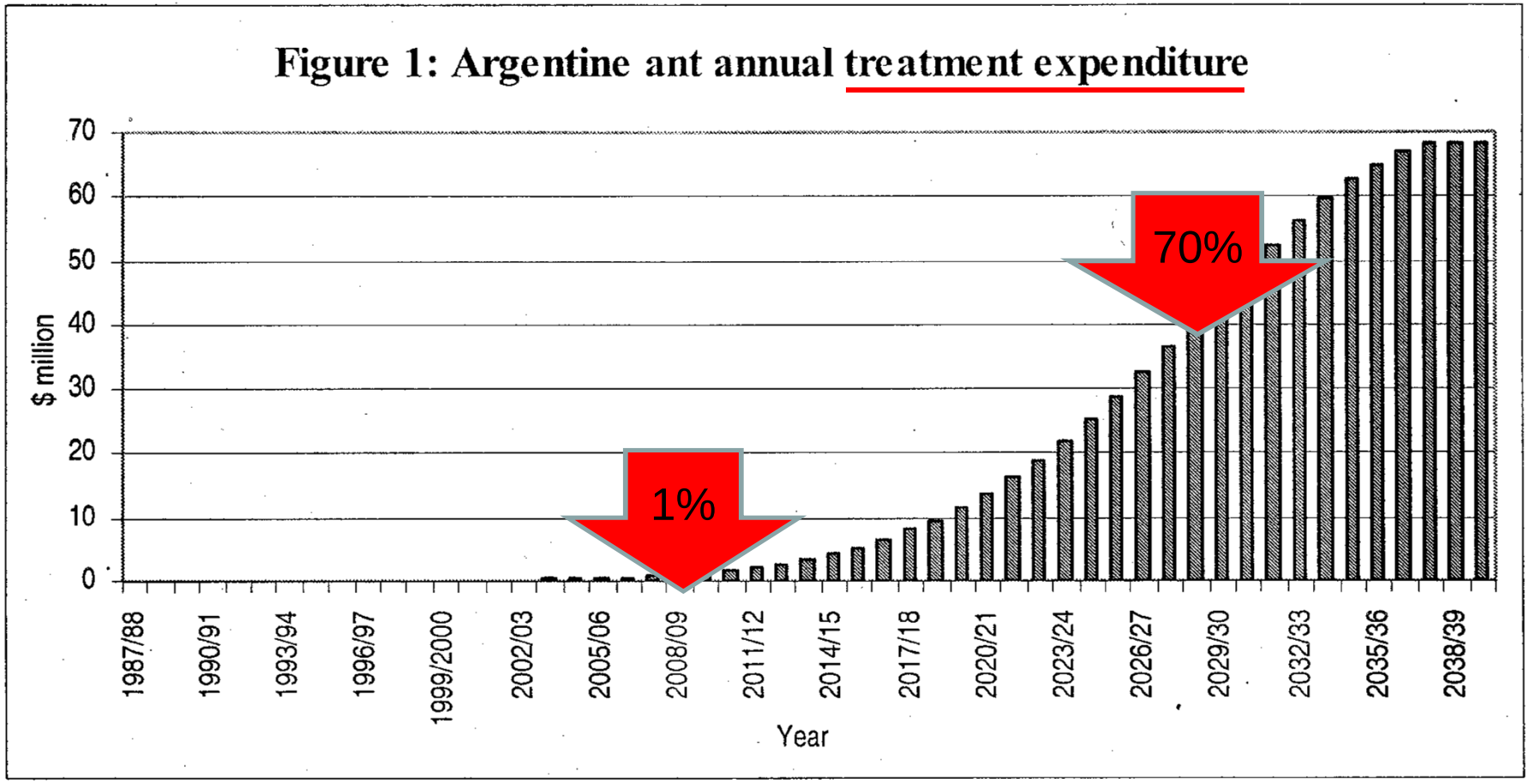


- Widespread, but very locally distributed (5-10% of sites)
- Biggest future problem (of all our current exotic ants) but still only at the beginning of their invasion in New Zealand

Ward DF, Harris RJ, Stanley MC. 2005 Human-mediated range expansion of Argentine ants in New Zealand. Sociobiology 45 (2): 401-408.

Argentine ants in NZ

• Estimated treatment costs (and thus impacts) are set to greatly increase over the next twenty years.



Argentine ants in NZ

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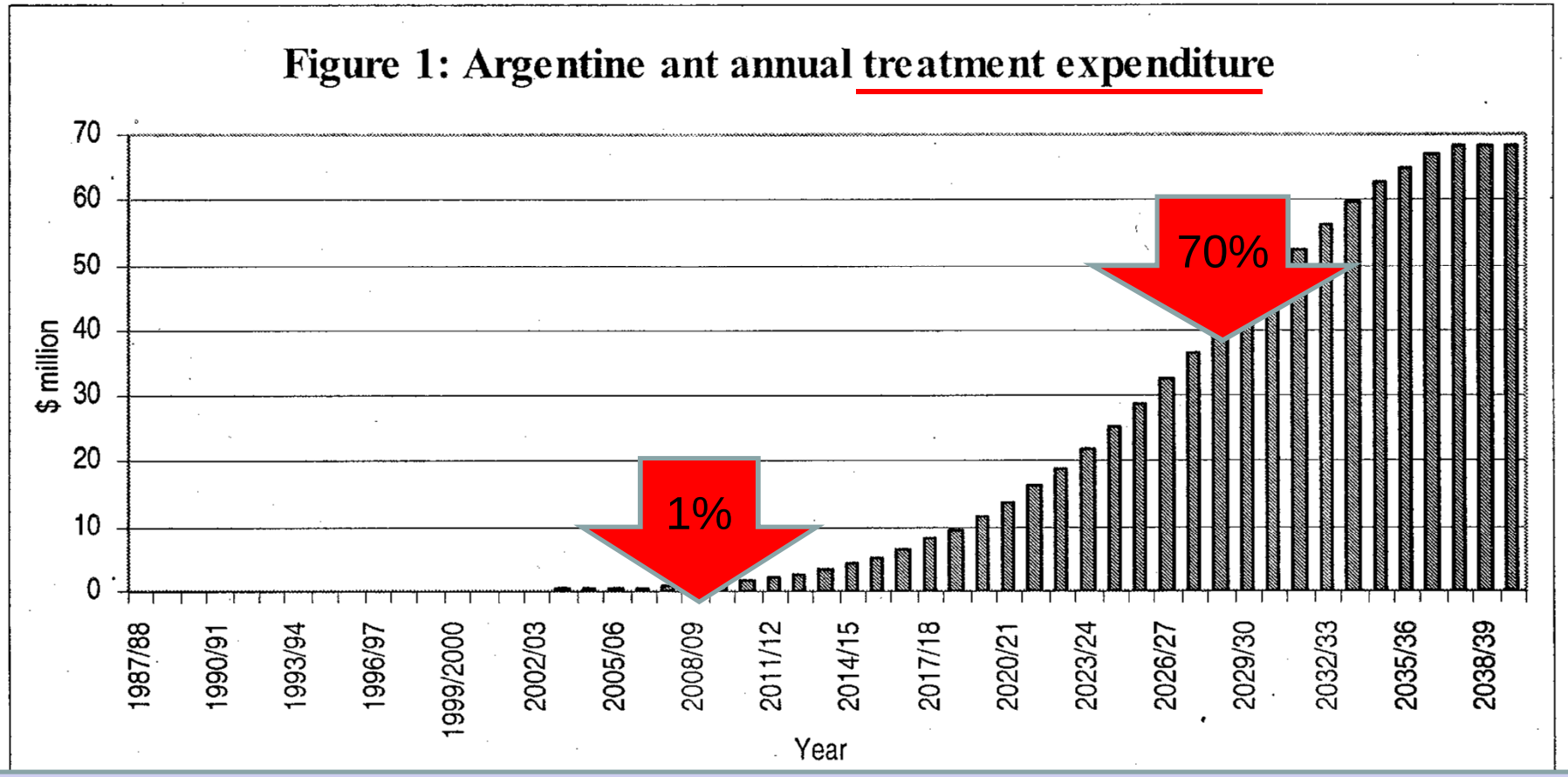
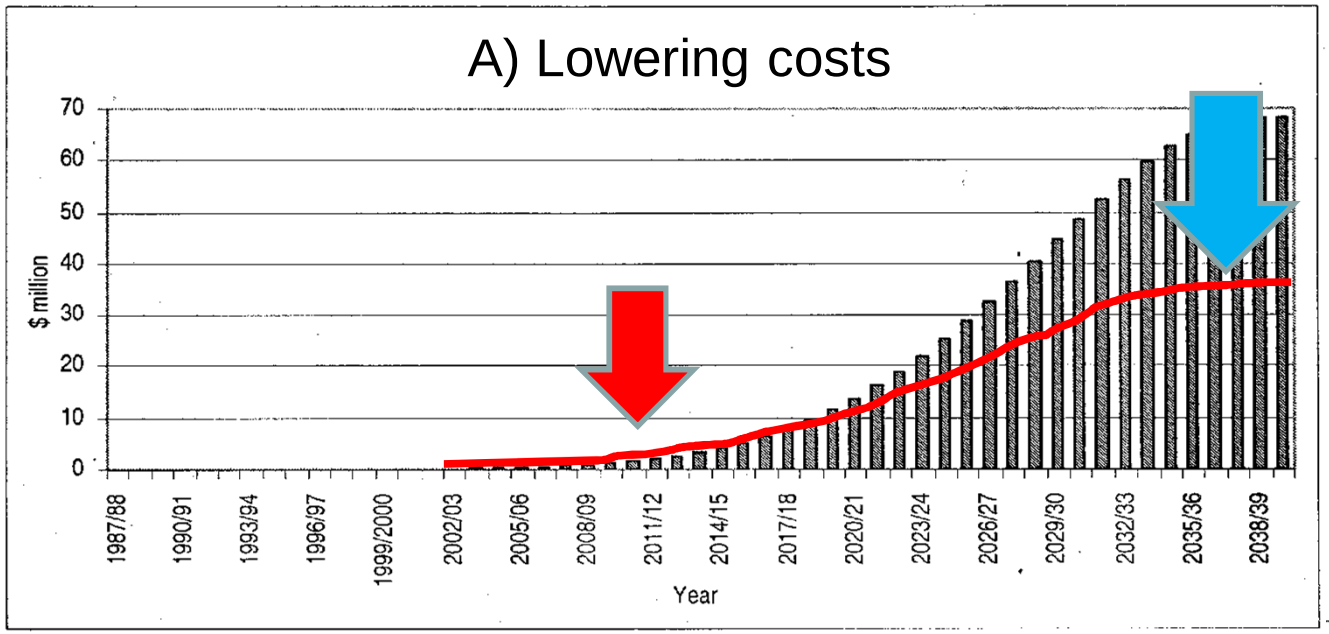
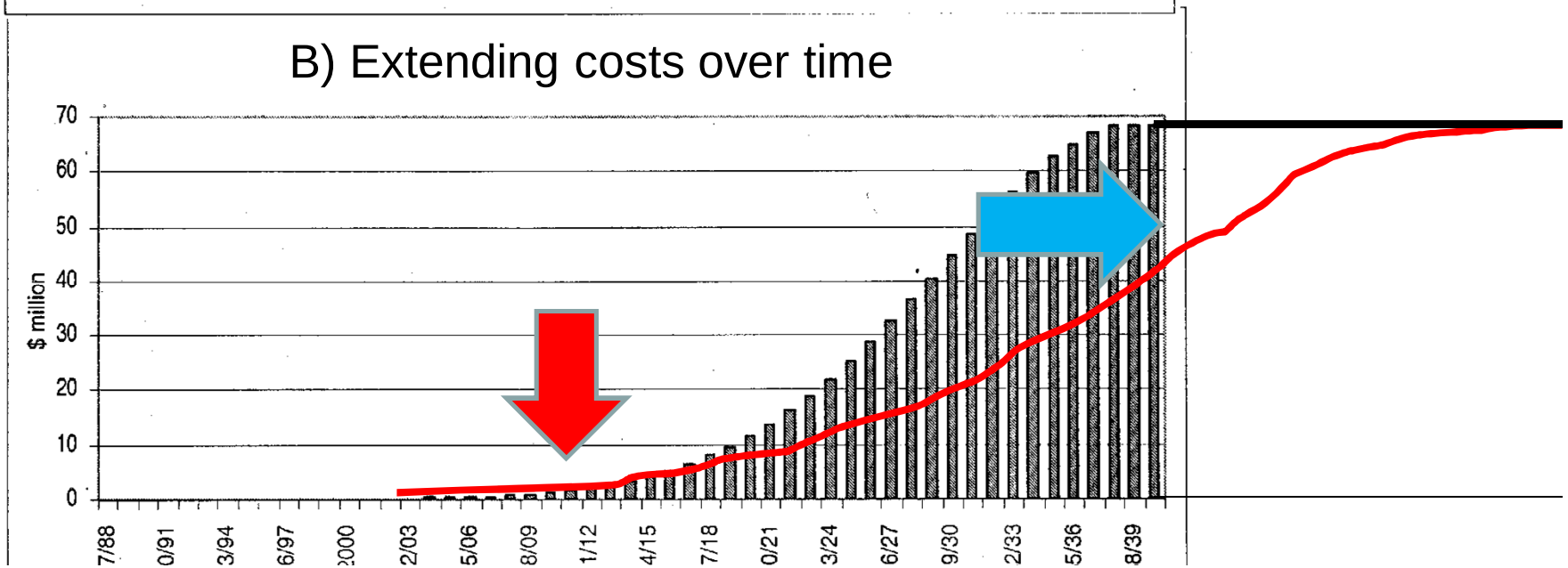


Our argument = an opportunity exists now to slow their spread to minimise impacts and costs in the longer term

Slowing the Spread of Argentine ants in NZ





Slowing the Spread of Argentine ants in NZ

Specifically: Slowing spread to protect valued conservation sites.

• Argentine ants rely on human-mediated transport for medium-long distance dispersal = a key aspect for management

<u>"Developing" a strategy based on an integrated approach of:</u>

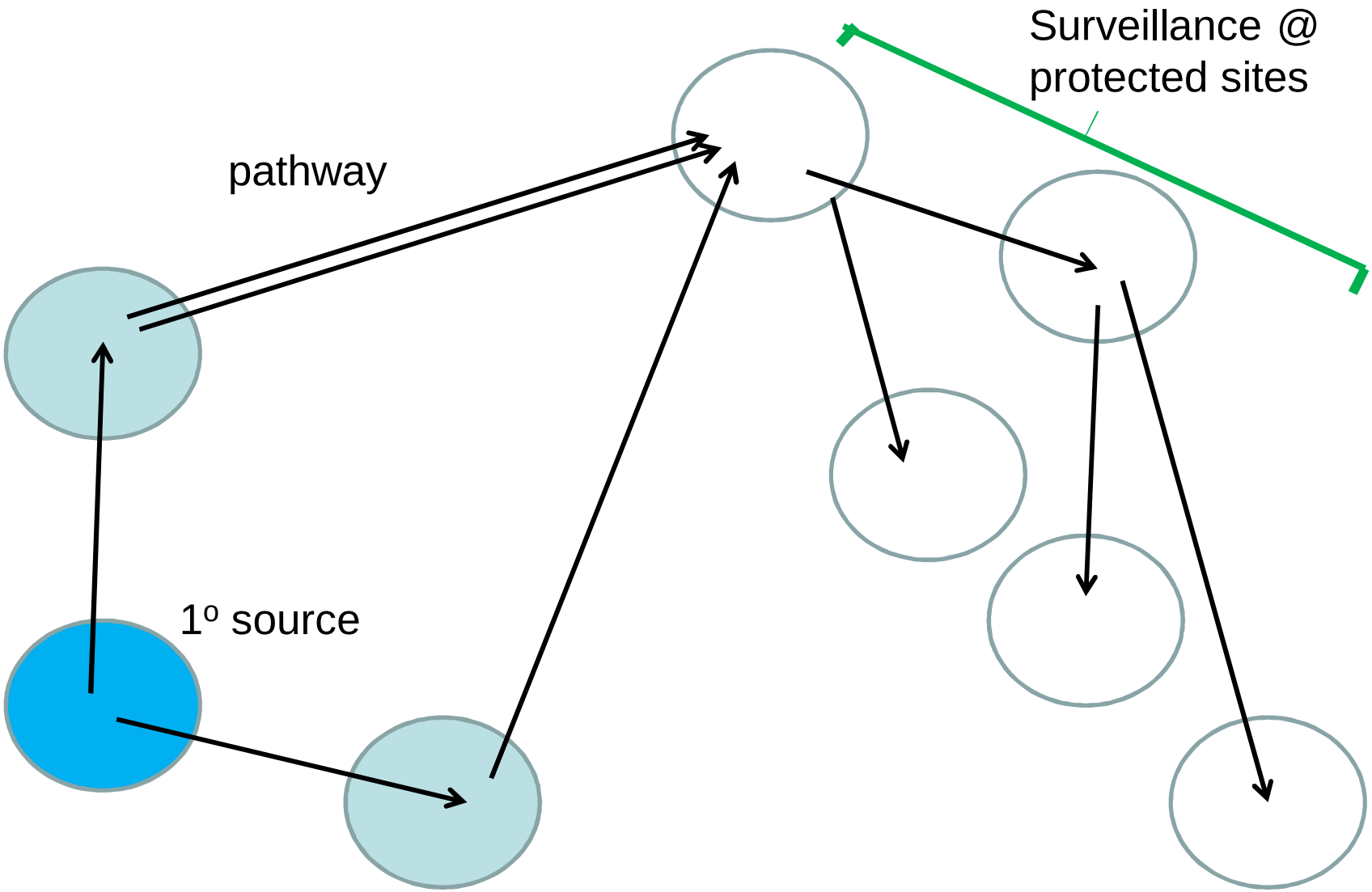
A) local eradication of primary 'source' populations,

B) minimising infestation along pathways, and

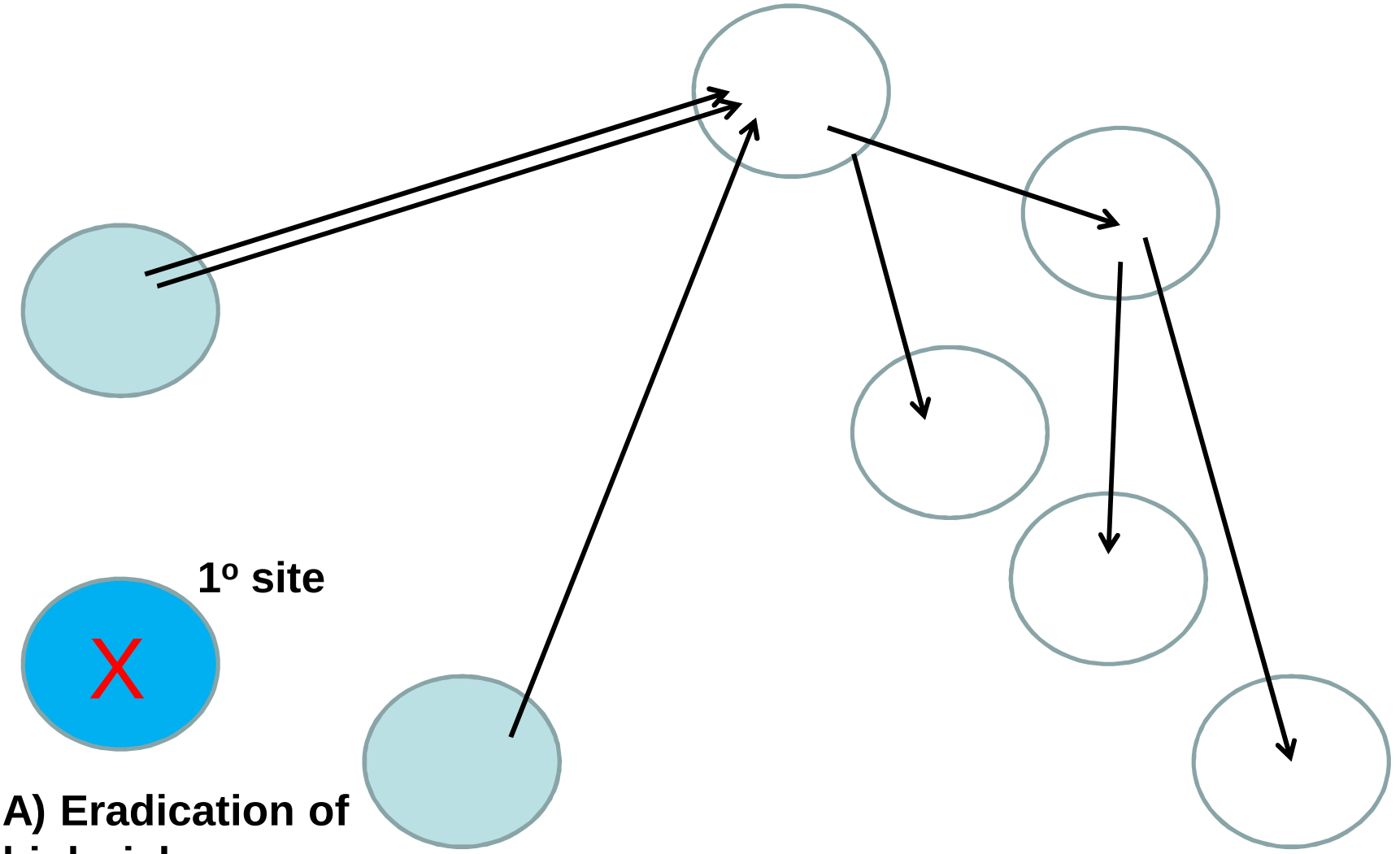
C) early detection (+control) of new populations

Ward DF, Green C, Harris RJ, Hartley S, Lester PJ, Stanley MC, Suckling DM, Toft RJ. 2010. Twenty years of Argentine ants in New Zealand: past research and future priorities for applied management. New Zealand Entomologist 33: 67-78

Slowing the Spread



Source Populations



A) Eradication of high risk source

Source Populations

A) Local eradication of high risk 'source' populations:

• IF there are certain sites (sources) which are primarily responsible for spreading Argentine ants, then the eradication/control of these prevents further new populations

• <u>However, a number of questions need to be answered:</u>

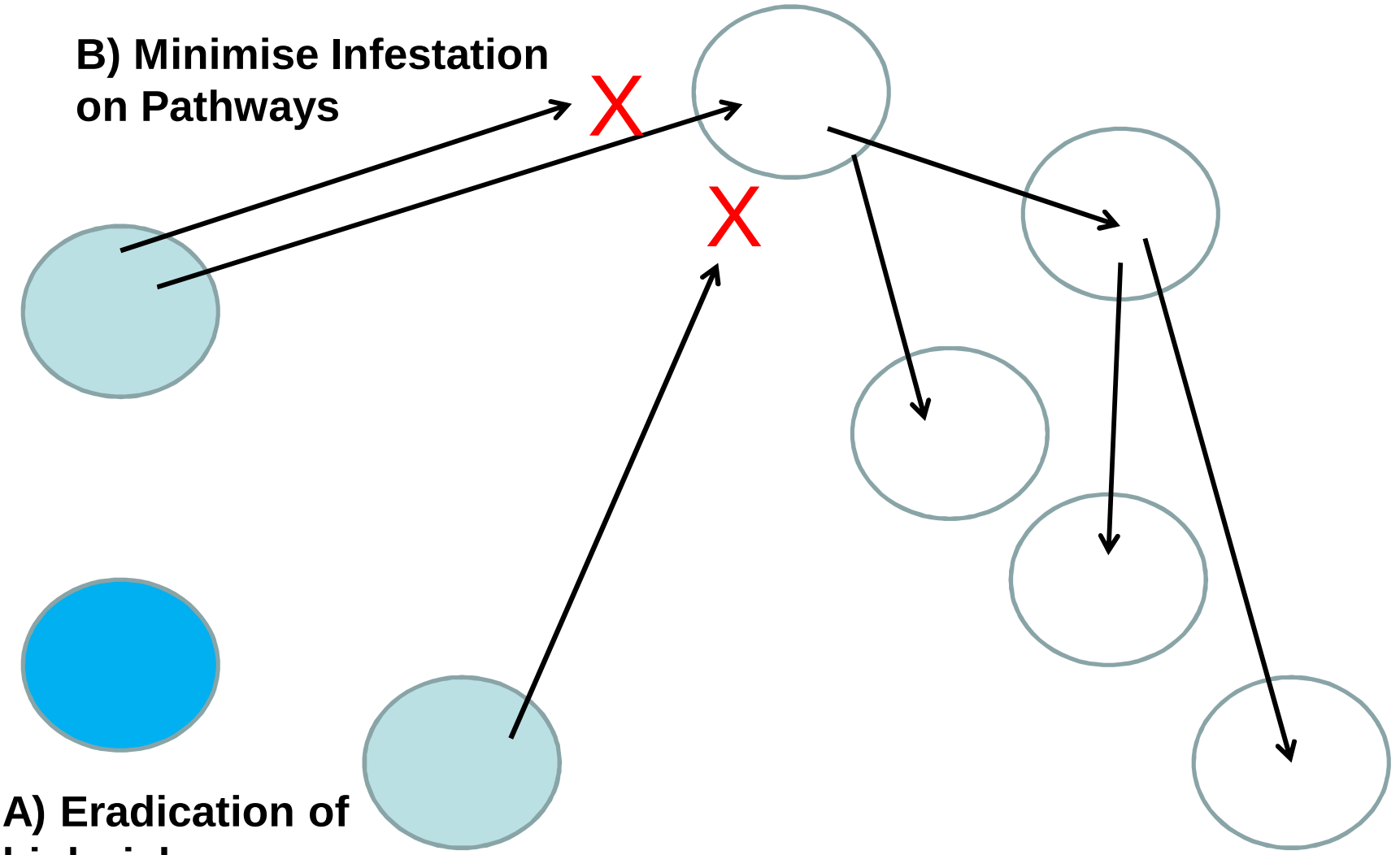
• how are high risk sources" identified?, can they be?

• what % of populations are from "high risk sources"?

• what evidence can we get that a site is a "high risk source", and consequences of their control (legal, political issues?)

• is eradication feasible, or ongoing control? - how long does it take a popn to recover from control before acting as a source again; can populations be contained?

Pathways


B) Minimise Infestation on Pathways
X
X
A) Eradication of high risk source

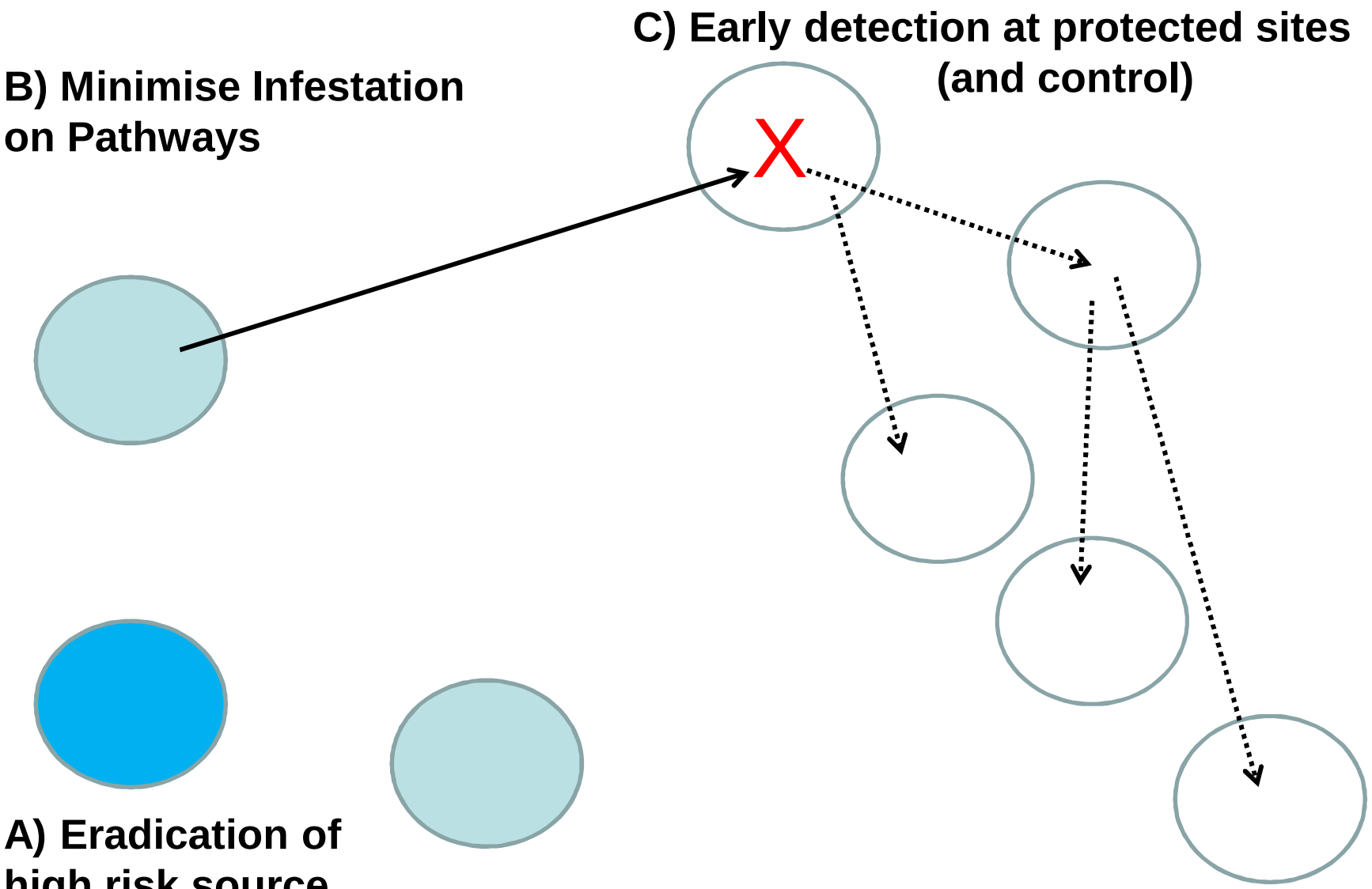
Pathways

B) Minimising infestation: reduces propagule pressure

- Argentine ants generally
  - have few intercept records, suggesting infestation is low?, or difficult to find?
  - are not associated with certain commodities

- However,
  - Argentine ants reliant on humans for medium-long distance dispersal
  - and it is relatively easy to measure human transport networks (direction, frequency, volume), = model/predict future spread to specific areas

Early Detection



Early Detection

C) Early detection (+control) of new populations:

- detection fundamental element of pest management
    1. surveillance of initial population
    2. determine presence of survivors post-control/eradication

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- detection fundamental element of pest management
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- how good is current detection?
- <u>probability of detection</u>
    - direct searching; = >0.90
    - baited vials; = 0.60 [0.40_{t1hr} – $0.75_{t3\text{-}6hrs}$]
    - pitfalls vs baits = 2x higher with pitfalls

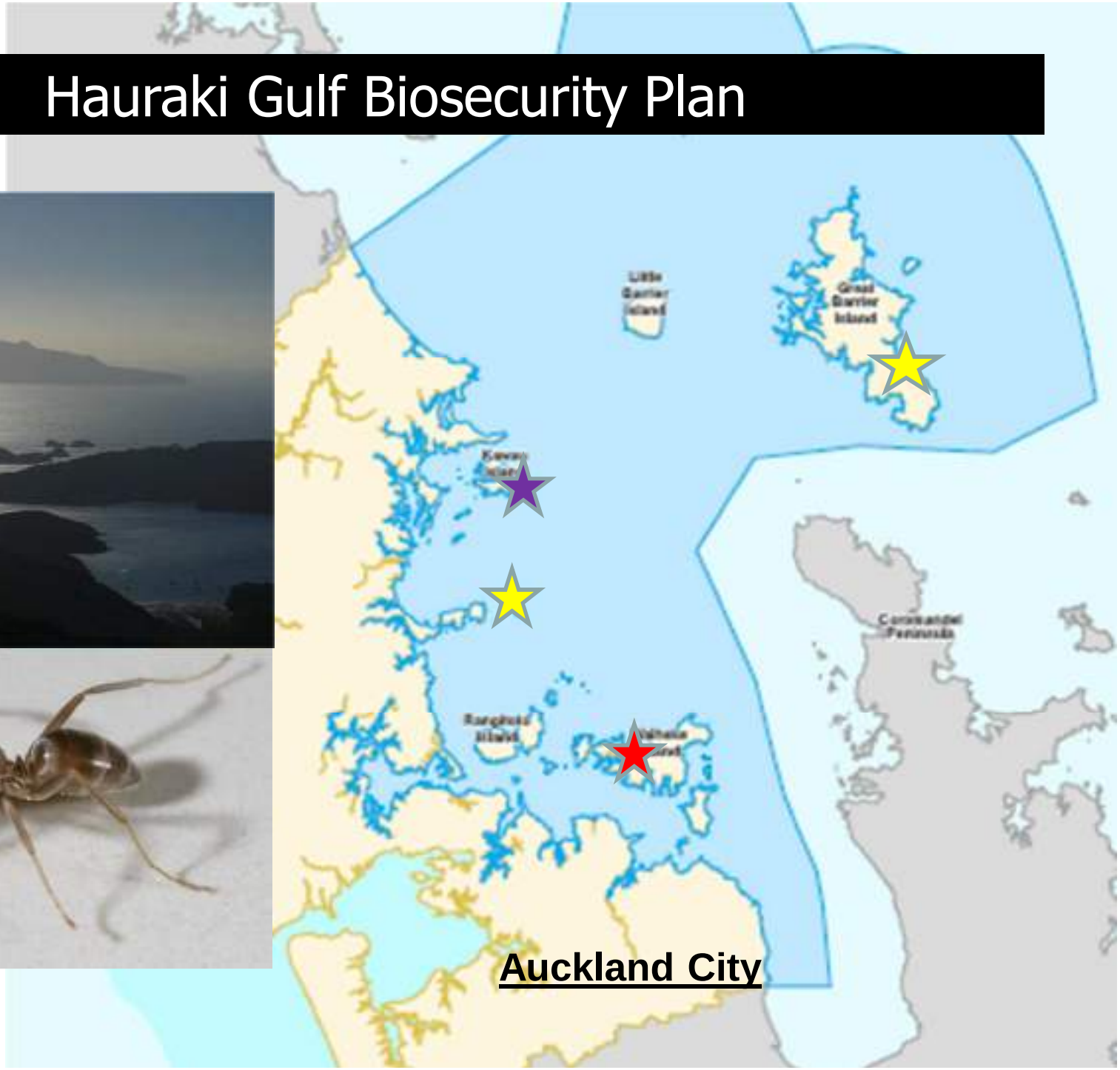
- how can we enhance detection for improved surveillance? [fish oil in pitfall traps increased detection 16x]
- how to incorporate detection theory into surveillance programs are implemented by local authorities?

Stanley MC, Ward DF, Harris RJ, Arnold G, Toft R, ReesJ. 2008. Optimising pitfall sampling for the detection of Argentine ants, *Linepithema humile* (Hymenoptera: Formicidae). Sociobiology 51 (2): 461-472

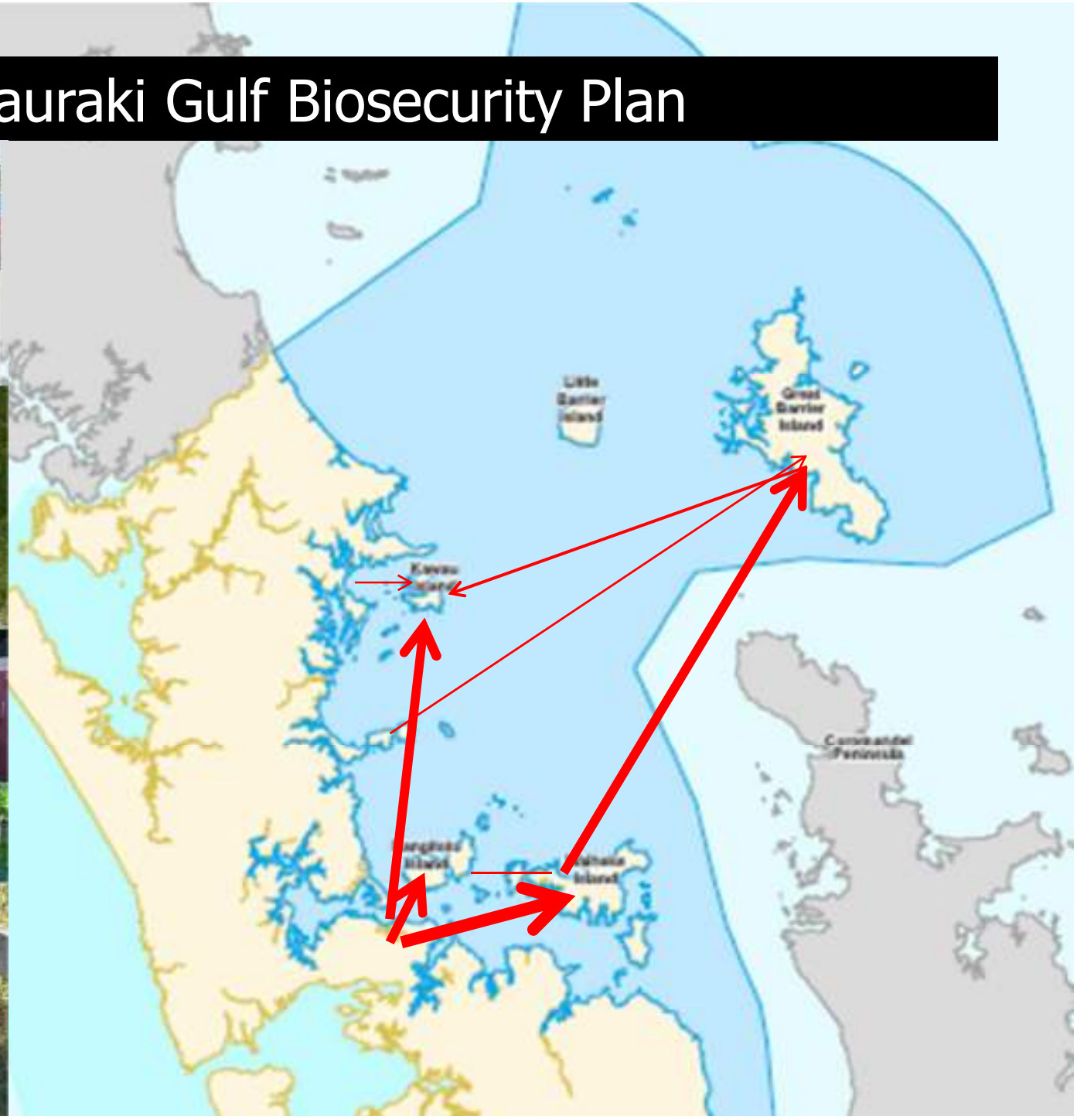
Hauraki Gulf Case Study

- Hauraki Gulf islands hot spot for conservation and species recovery
- National strongholds for endangered species
- Recreational & cultural values
- Home for 8628 residents

Hauraki Gulf Biosecurity Plan



Hauraki Gulf Biosecurity Plan



Summary: Future of Argentine ants for NZ

• Framework useful approach for Argentine in NZ, but can be extended elsewhere
• There are scientific & practical issues to resolve

• ?unsure about its utility for other ant species (with better self-spread)

• Charles et al (2002) concluded:
"further decisions on action against Argentine ants (in NZ) revolve around cost ,and the social and political will to act"

.... **an opportunity exists now to slow their spread to minimise impacts and costs in the longer term**

Charles J, Suckling DM, Allan DJ, Froud K, Dentener PR, Conolly P, Verberne H. 2002. The distribution of Argentine ant in New Zealand: Can a ten-year old decision not to eradicate be re-visited? In: Defending the Green Oasis: New Zealand Biosecurity and Science. Eds SL Goldson, DM Suckling. New Zealand Plant Protection Society, Lincoln. p109-124.

Thanks

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