

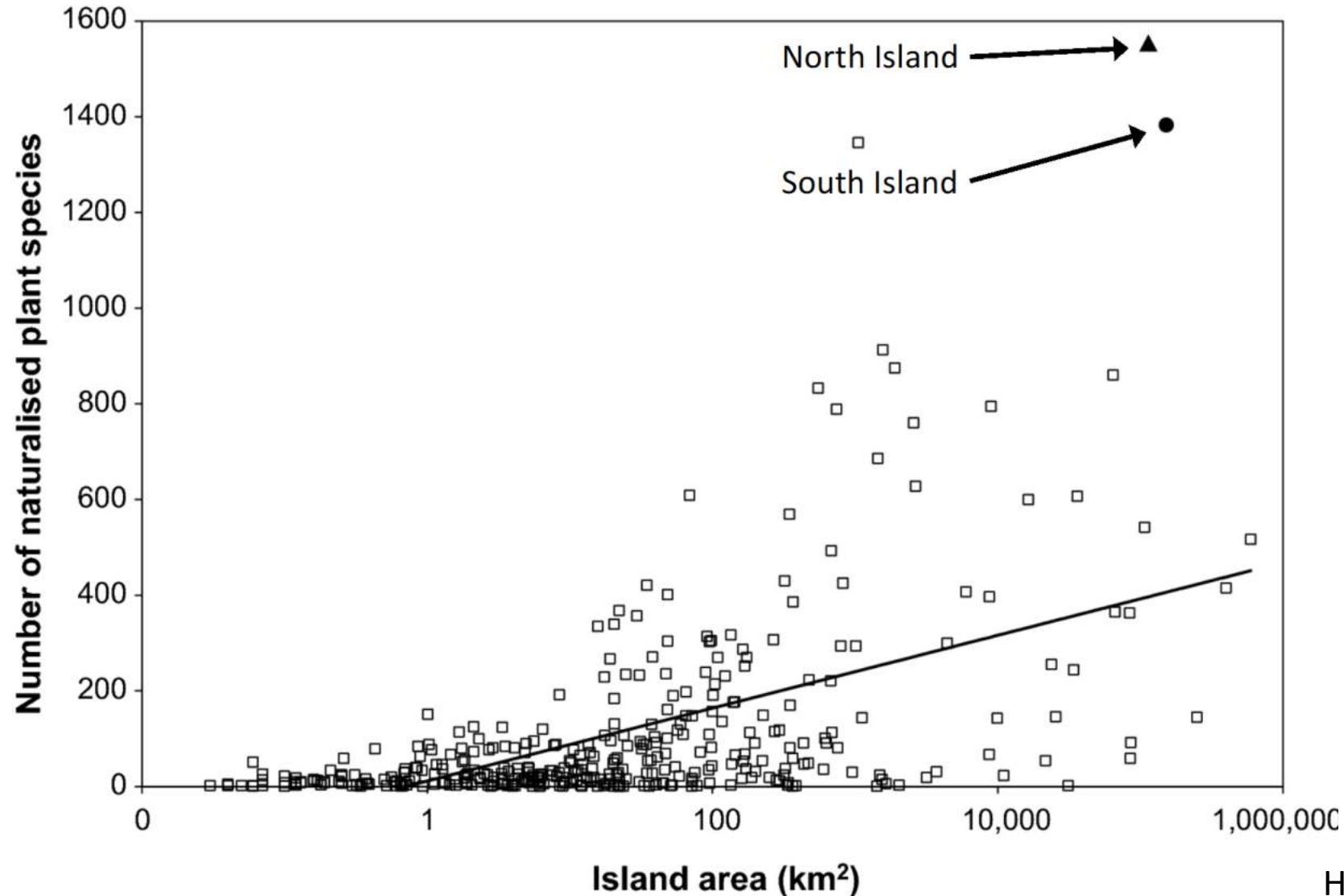
Ecological insights and the landscape-scale management of wilding conifers



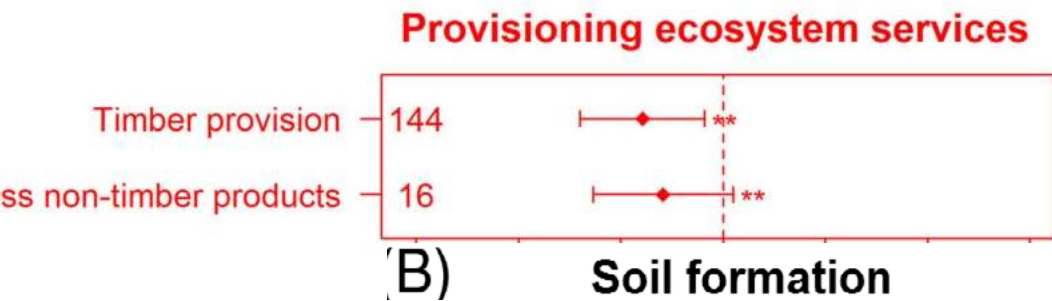
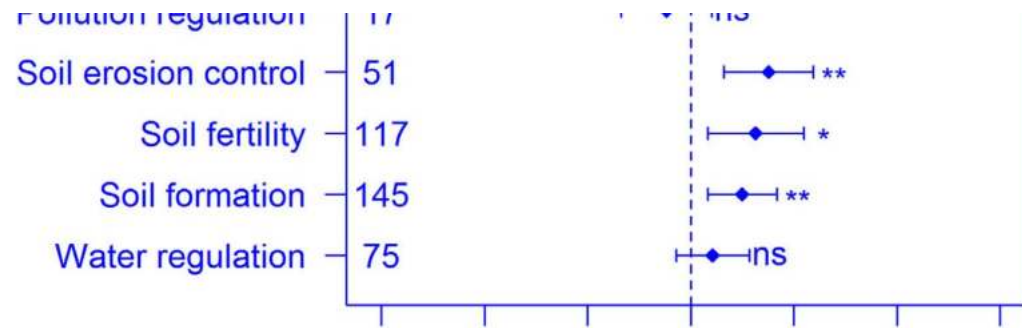
- Wildings are major invaders in NZ and overseas
- NZ leads the way in terms of management and organising at a national scale
- A more integrated partnership model has been developed to link research, policy and management
- Now we're faced with how to sustain this approach to ensure long-term benefits



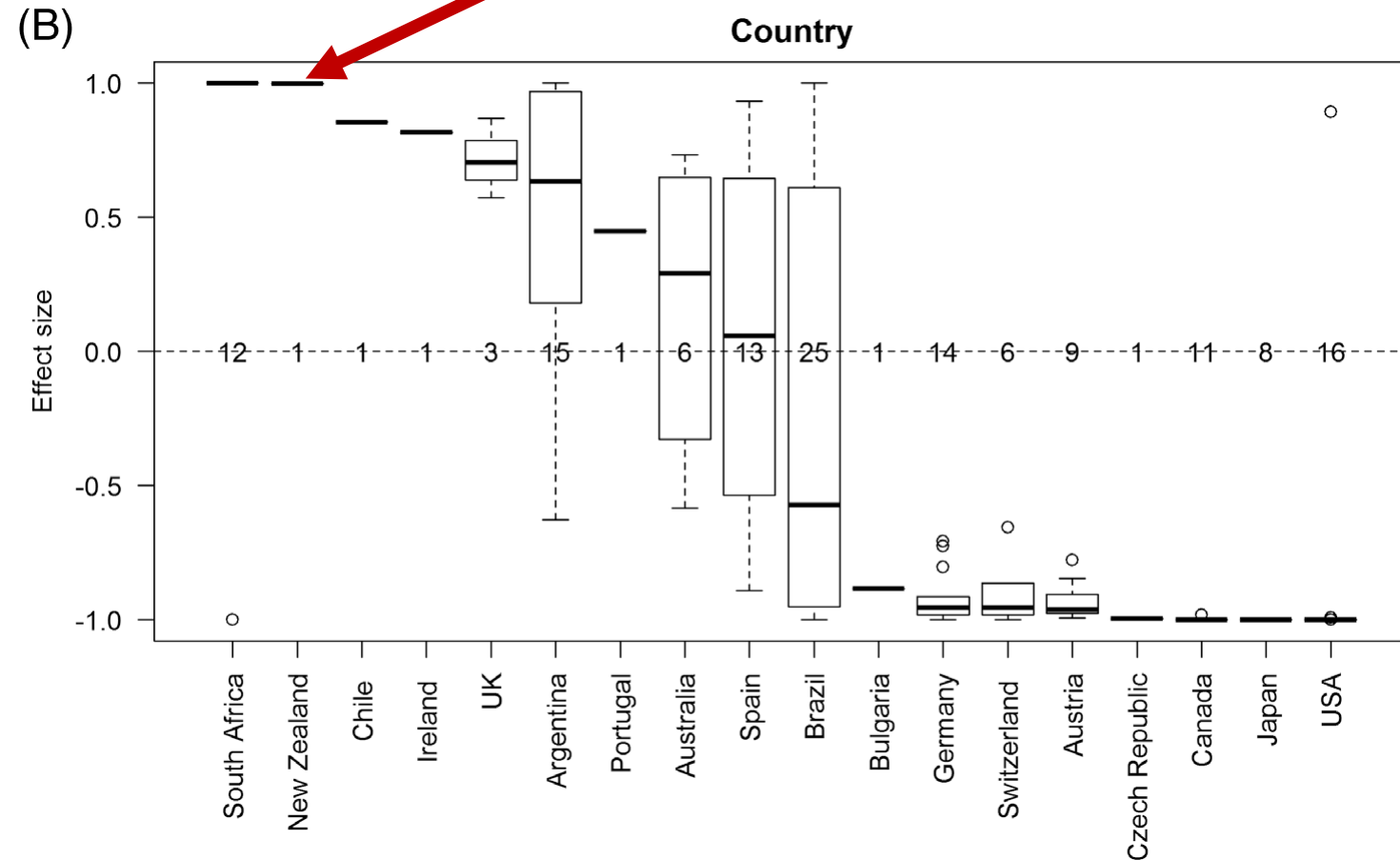
AoNZ harbours more naturalised non-native plant species than almost any other island worldwide



But... non-native tree species provide numerous benefits



Almost entirely drive by Pinaceae





How have pines become
so invasive?



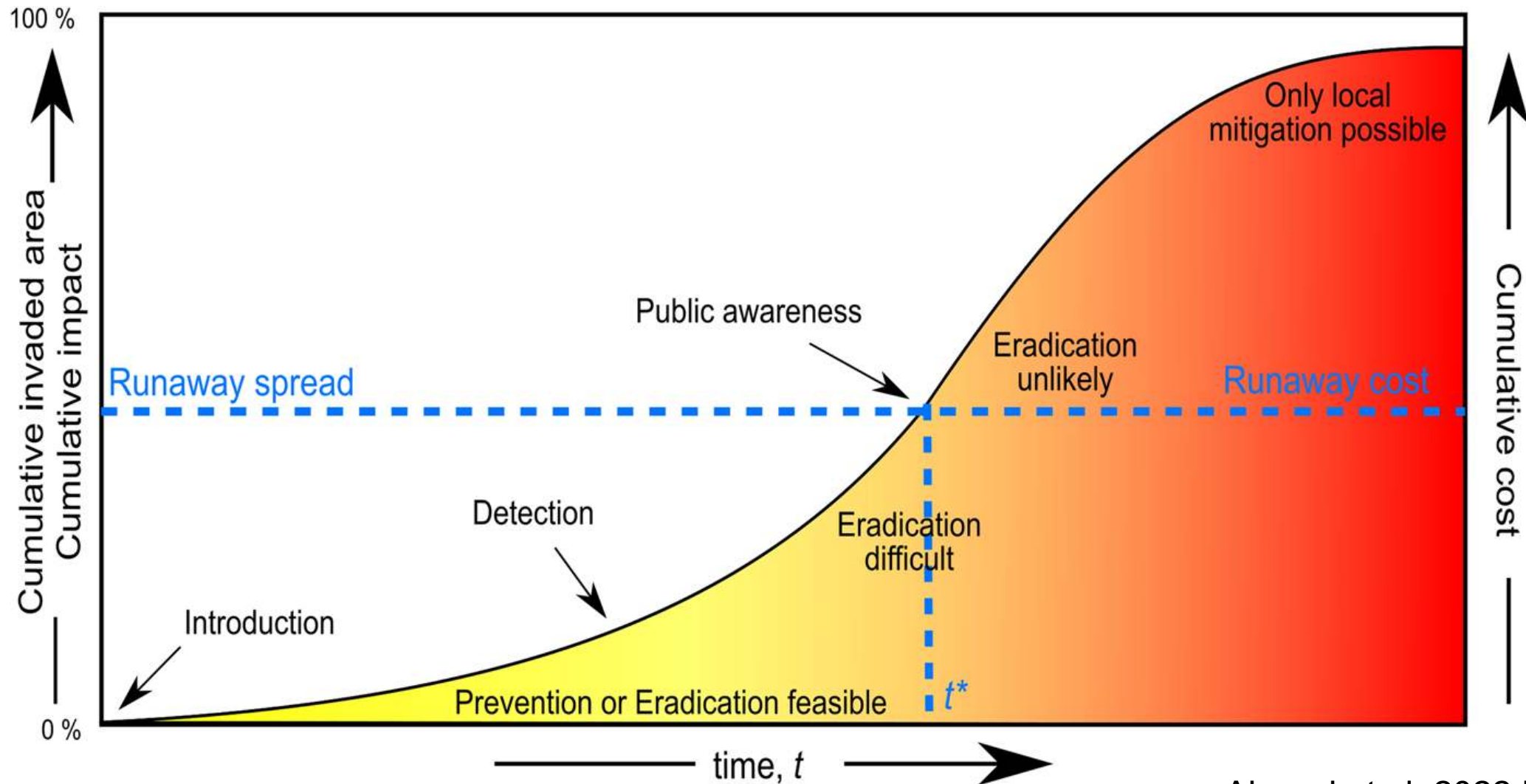
Pinus contorta, Kawekas

Determinants of wilding species in NZ

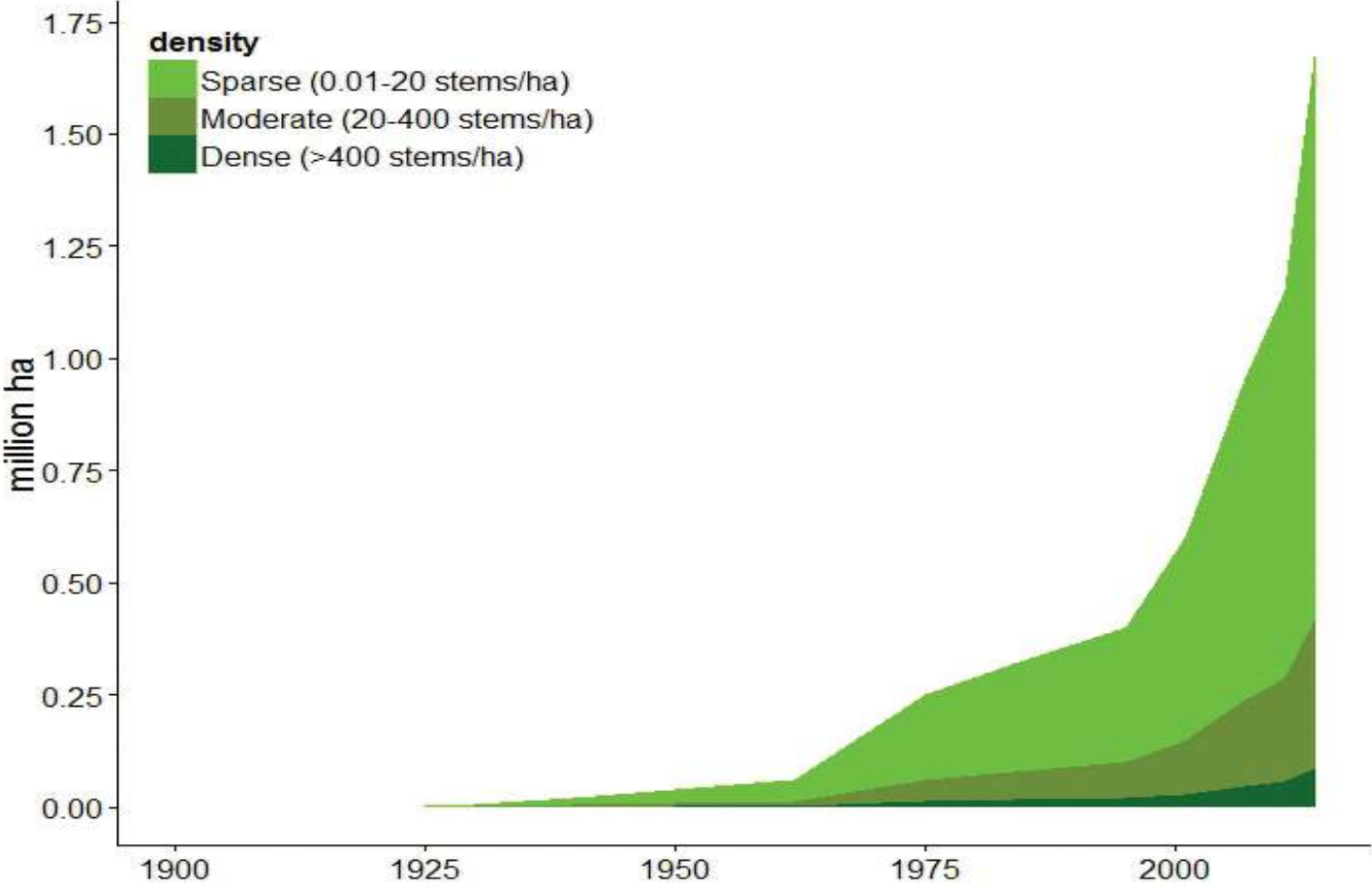
Variable	Importance
Climate suitability	29.1
Forestry use	21.1
Area planted	19.1
Years to maturity	9.5
Native range size	6.4
Introduction date	4.1



Detection and public awareness occur too late to prevent or eradicate invaders



Status quo management was not controlling the increase in wilding conifers nationally



Without management the area invaded could be 7 million ha, or 25% of NZ's total land area

Wilding conifer national strategy



MPI

DOC

LINZ

NZ Defence

Regional Councils

FOA

Federated Farmers



"Winning against wildings" (2016-2021) and "Vive la Resistance" (2021-026)

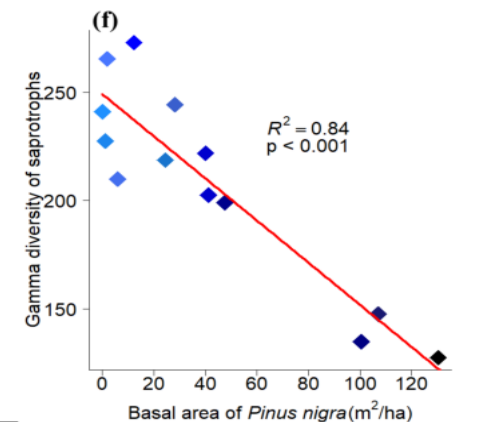
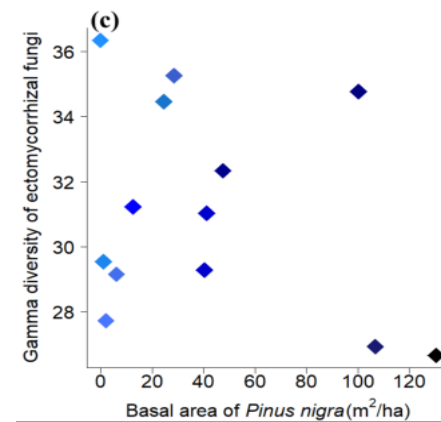
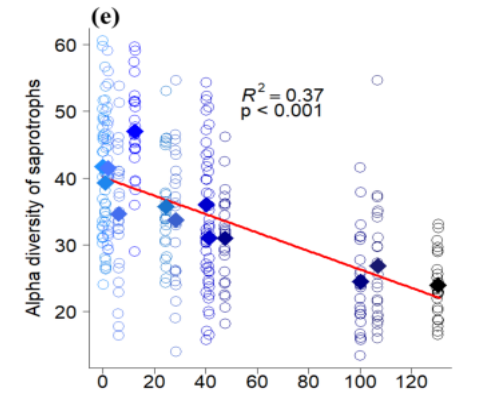
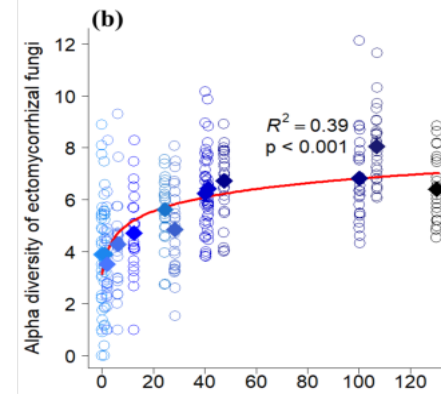
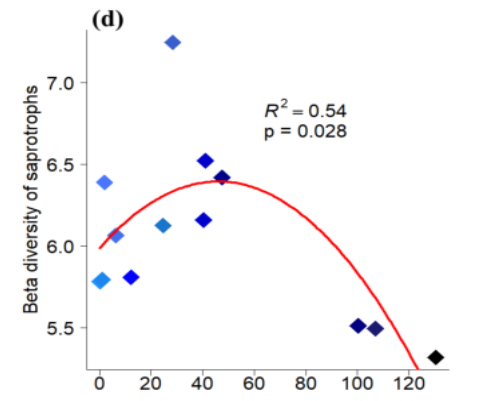
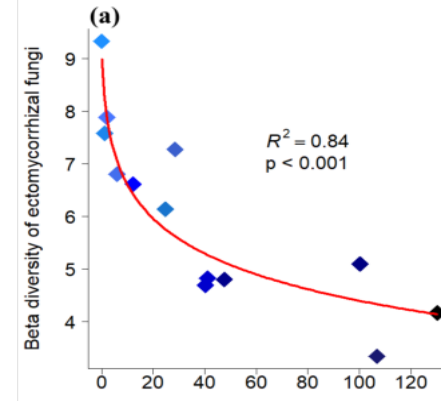
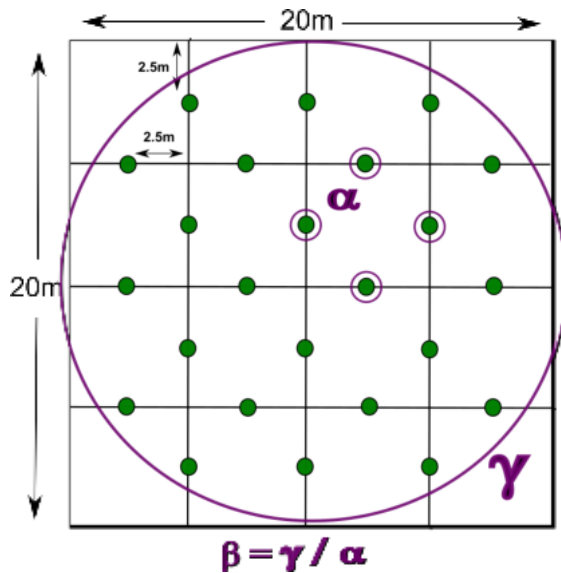
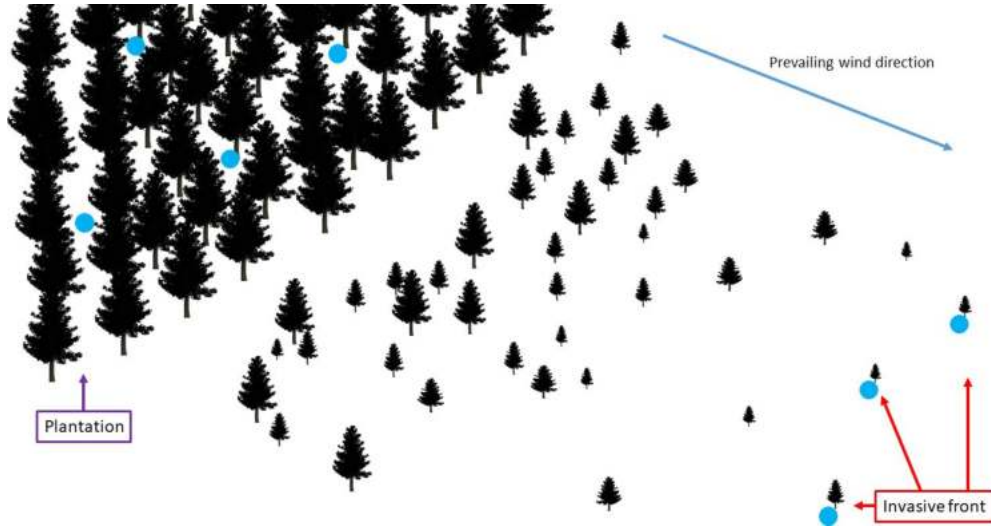
- 5 yr MBIE research programmes
- **Integrates** ecology, management and modelling
- An overall goal is to improve management across all stages of invasion
- Tightly linked to national efforts

Summary: wilding risk calculator evidence

1. Species spread ✗ - some species underestimated
2. Palatability ✗ - wild herbivores don't prevent establishment
3. Siting of new planting ✓ - support for these assumptions
4. Downwind grazing ✓ ✗ - yes, but nowhere completely safe in a complex landscape
5. Downwind vegetation ✓ - general support for these assumptions



Wilding conifers have major ecosystem effects



Some of what we discovered for ecology:

- Dispersal was underestimated
- Diversity changes rapidly but differently among taxa
- Shift from slow to fast nutrient cycling
- Increased soil nutrients persist for > a decade
- **Wilding fundamentally alter ecosystems, and these impacts are not easily reversed**
- **Secondary and re-invasions are more common than native regeneration**

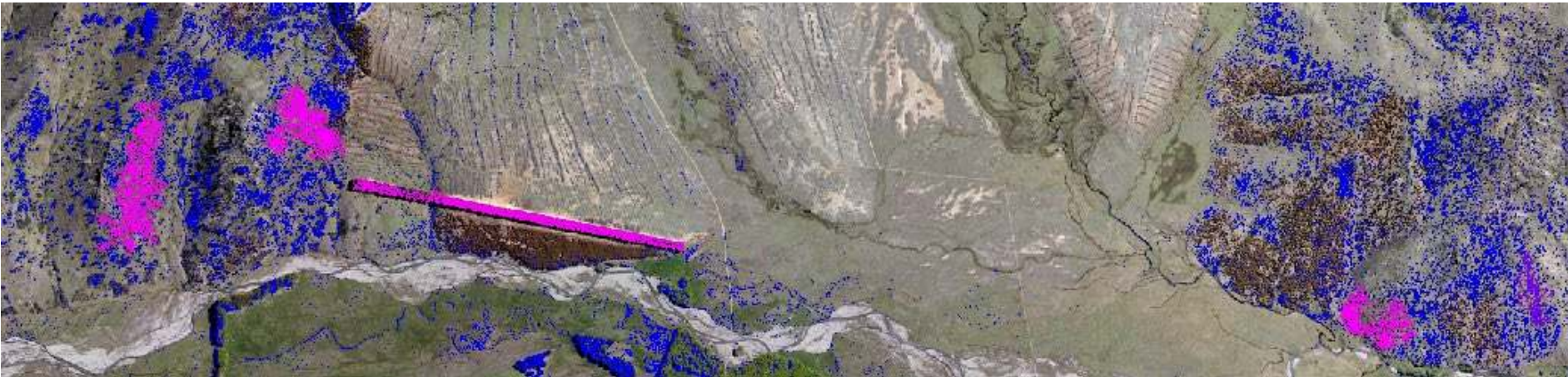


Detection, control and prevention needed to 'flatten the curve'



Innovations and improvements to control include...

- Development of early wilding detection
- Low dose herbicides tested
- UAVs tested as platform for targeted control
- 3-D wind modelling for spread risk developed
- Progress toward development of sterile Douglas fir



Optimising management requires societal considerations

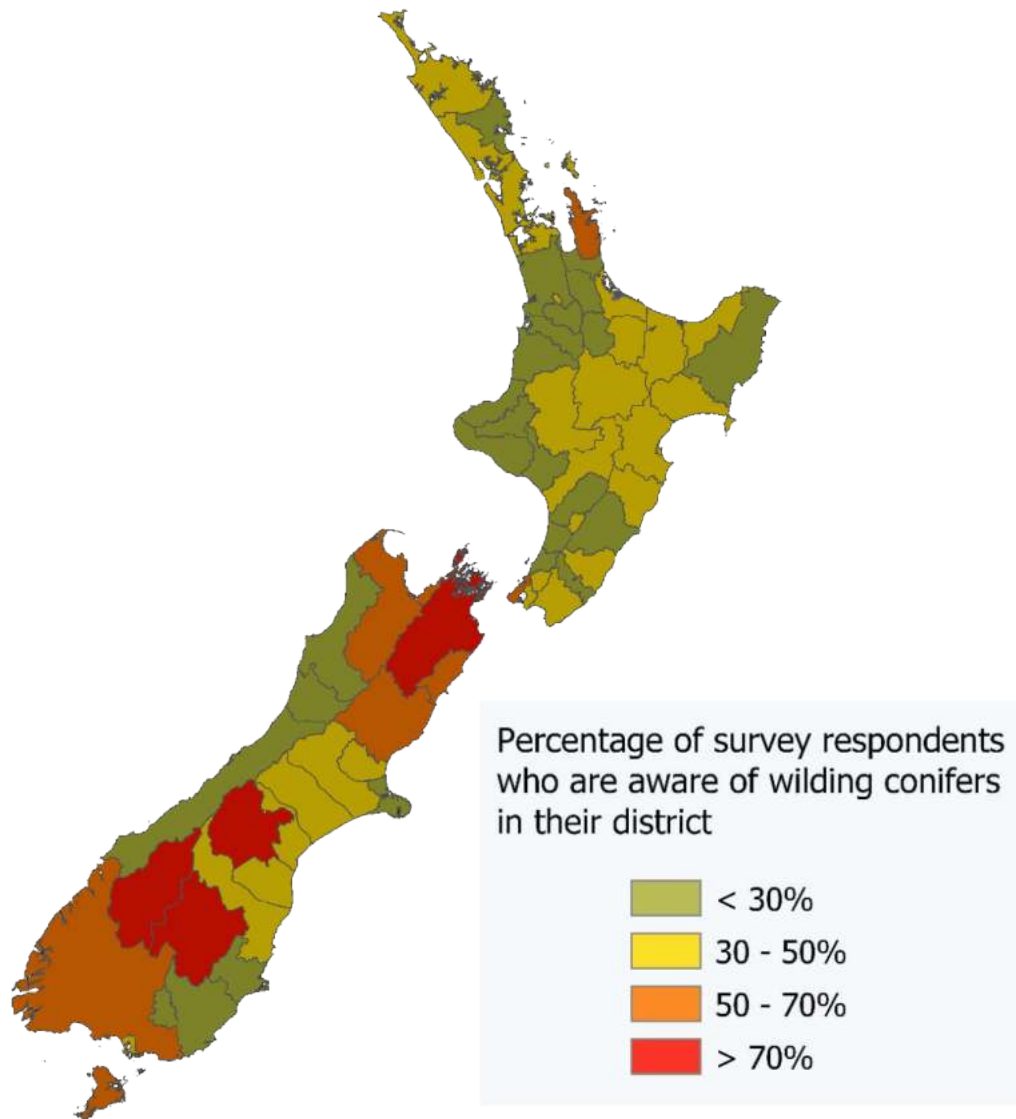
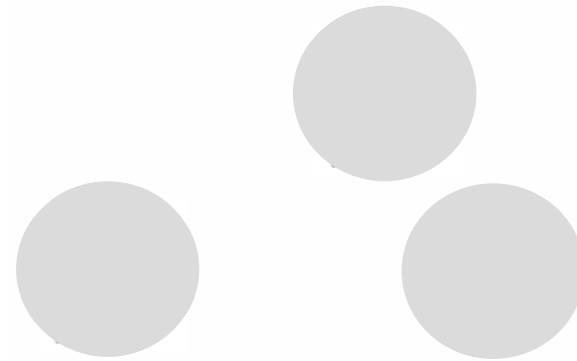


Figure 1. Data Source: LINZ. Crown copyright reserved.



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RESEARCH ARTICLE

PEOPLE
NATURE
BRITISH
ECOLOGICAL
SOCIETY

Invasion landscapes as social-ecological systems: Role of social factors in invasive plant species control

Johanna Yletyinen¹ | George L. W. Perry² | Olivia R. Burge¹ | Norman W. H. Mason³ | Philip Stahlmann-Brown⁴

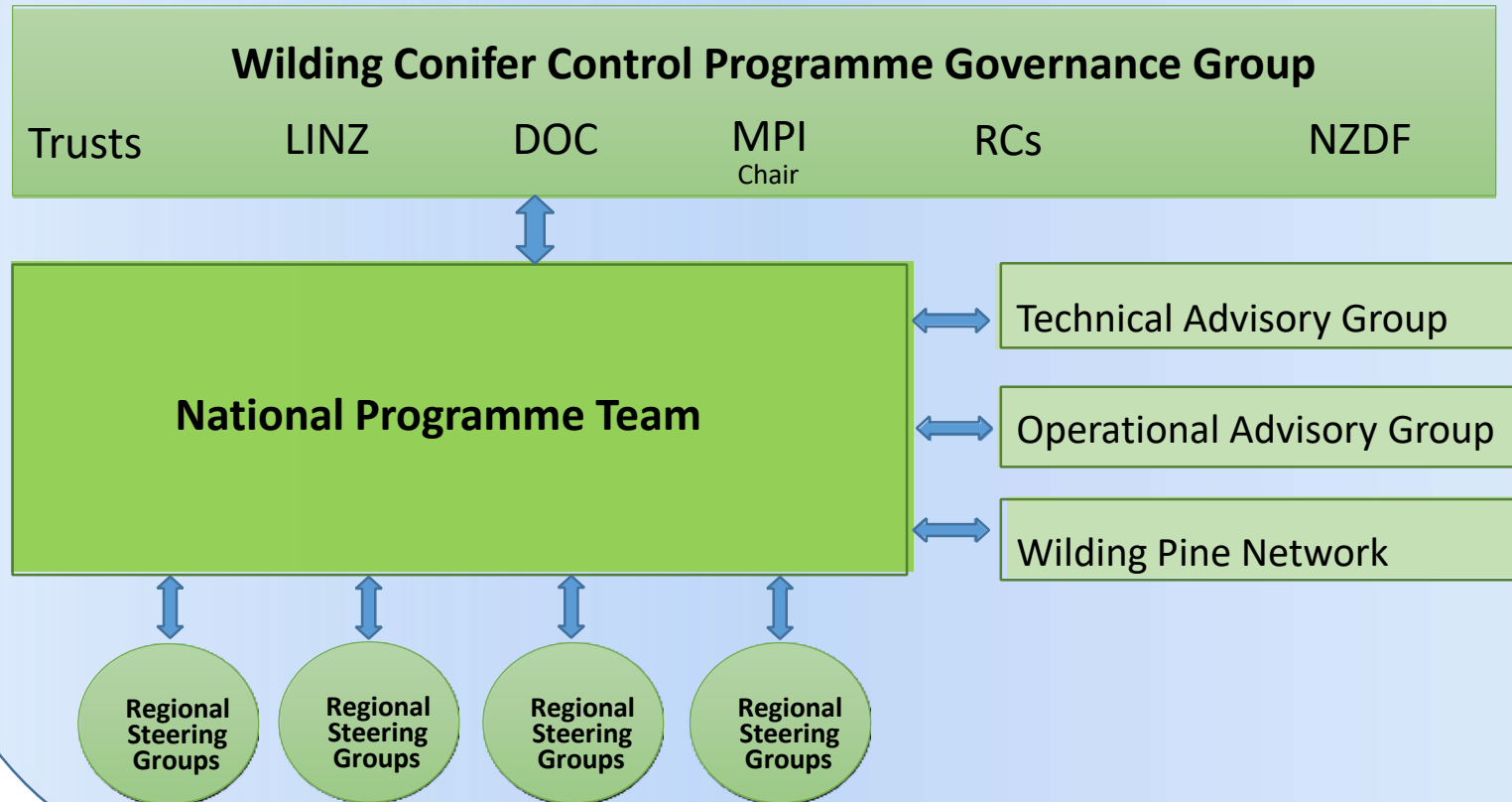
What impacts are wildings having? Is management effective?
What benefits result from containing or controlling wildings?



Jollies Pass, Hanmer Springs

Programme Structure

*New Zealand Wilding Conifer Management Strategy
2015-30* **NATIONAL PROGRAMME GOVERNANCE**



So, what's next?



Space invaders: A review of how New Zealand manages weeds that threaten native ecosystems

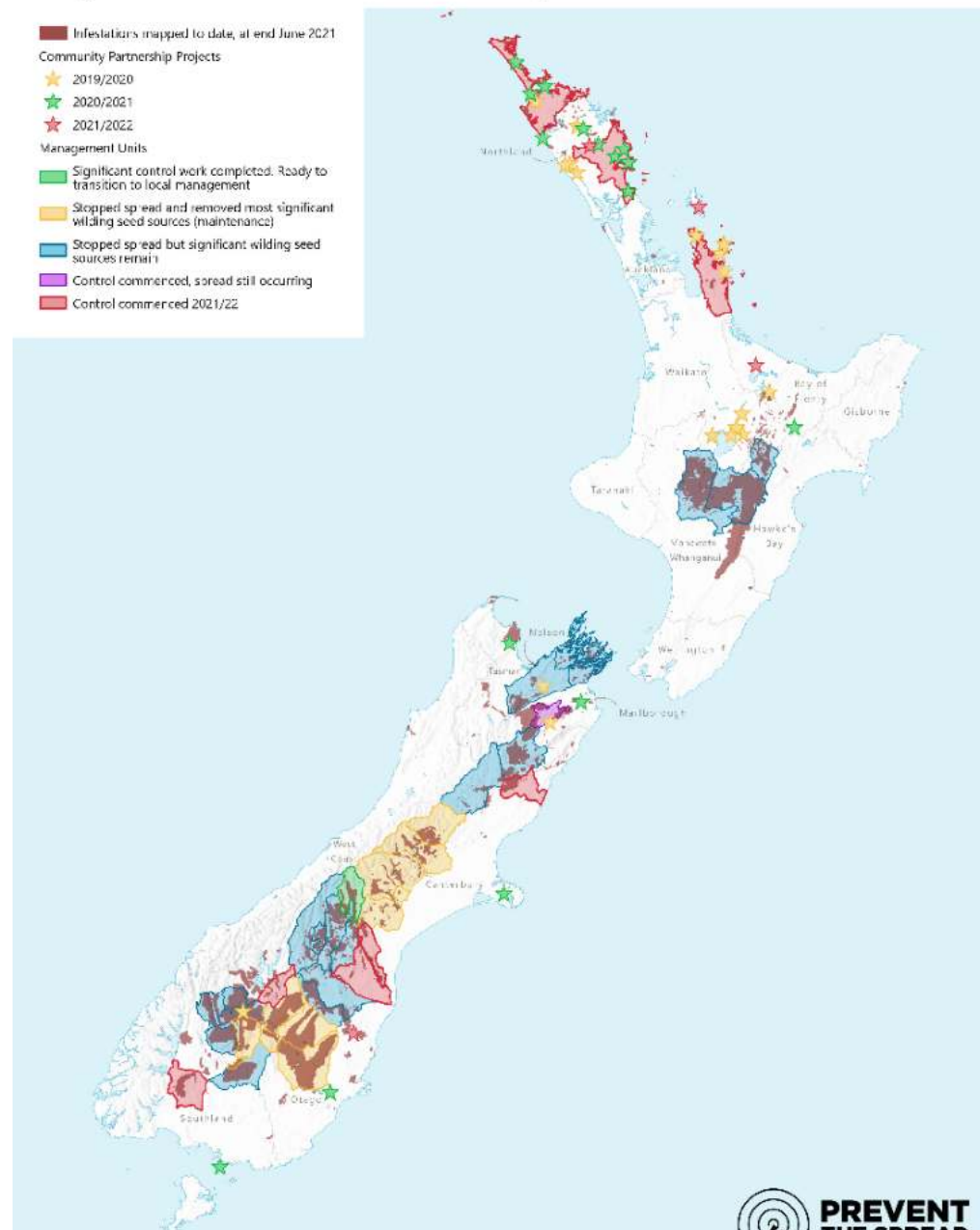
November 2021

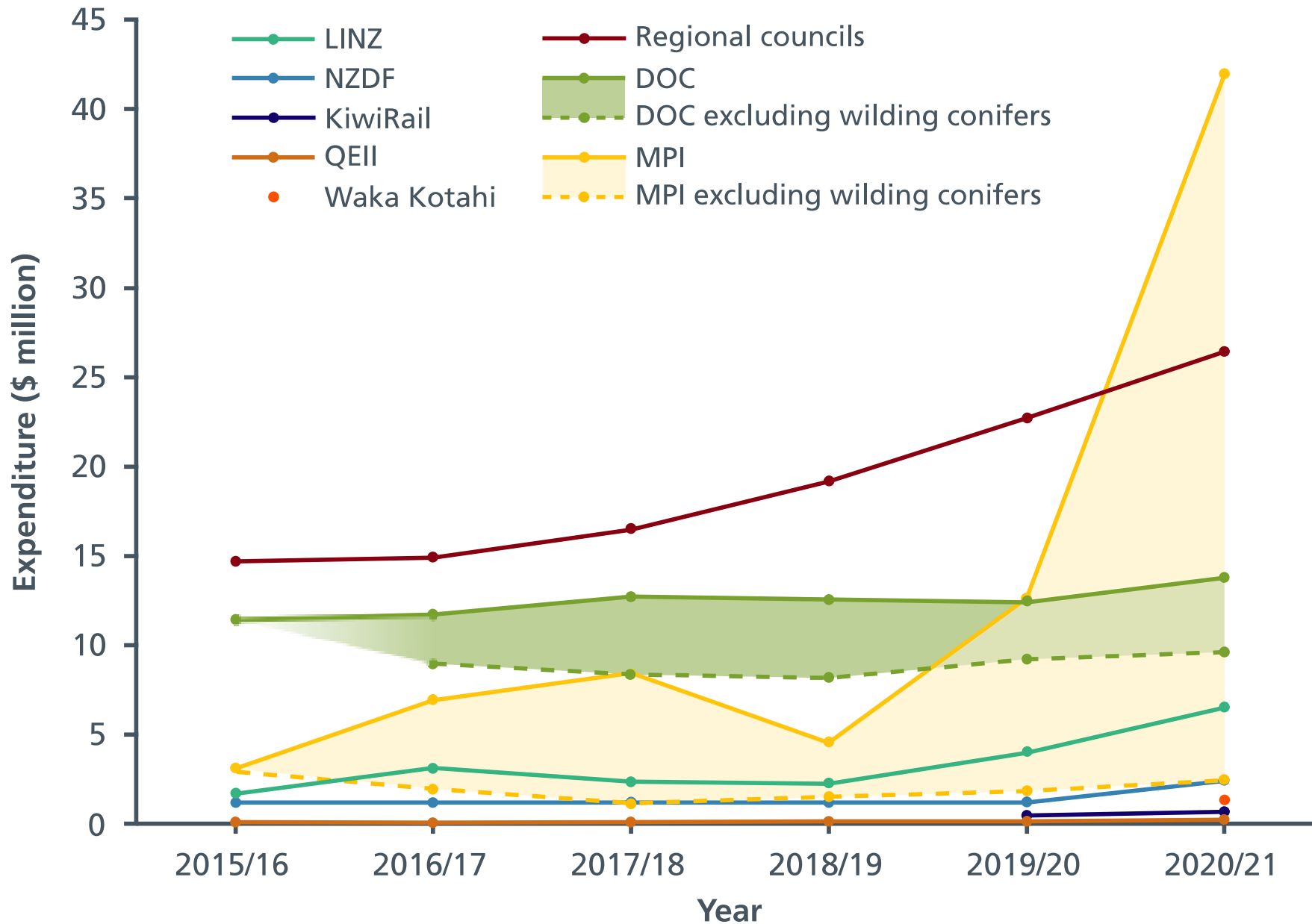


National Wilding Conifer Control Programme 2016 – 2021/22

Progress to date and current status of management units at end June 2021

- Infestations mapped to date, at end June 2021
- Community Partnership Projects
 - ★ 2019/2020
 - ★ 2020/2021
 - ★ 2021/2022
- Management Units
 - Significant control work completed. Ready to transition to local management
 - Stopped spread and removed most significant wilding seed sources (maintenance)
 - Stopped spread but significant wilding seed sources remain
 - Control commenced, spread still occurring
 - Control commenced 2021/22





Source: LINZ, NDZF, KiwiRail, QEII, Waka Kotahi, regional councils, DOC, MPI, 2021



Wilding pines removal provides jobs for COVID-displaced workers

Date: 31 Jul 2020

Category: [News](#) | [Funding](#) | [Pest Management](#) | [Land Use](#)

Central government funding has allowed for the creation of extra jobs in new wilding pines removal projects in Canterbury, primarily hiring people impacted by the economic fallout of COVID-19.

Of the \$3 million COVID-relief funding made available by the government, \$1.9 million went to Canterbury [wilding pine removal projects](#). Three geographically separate areas were identified as being ideally suited, and six local contractors were tasked with hiring new staff.

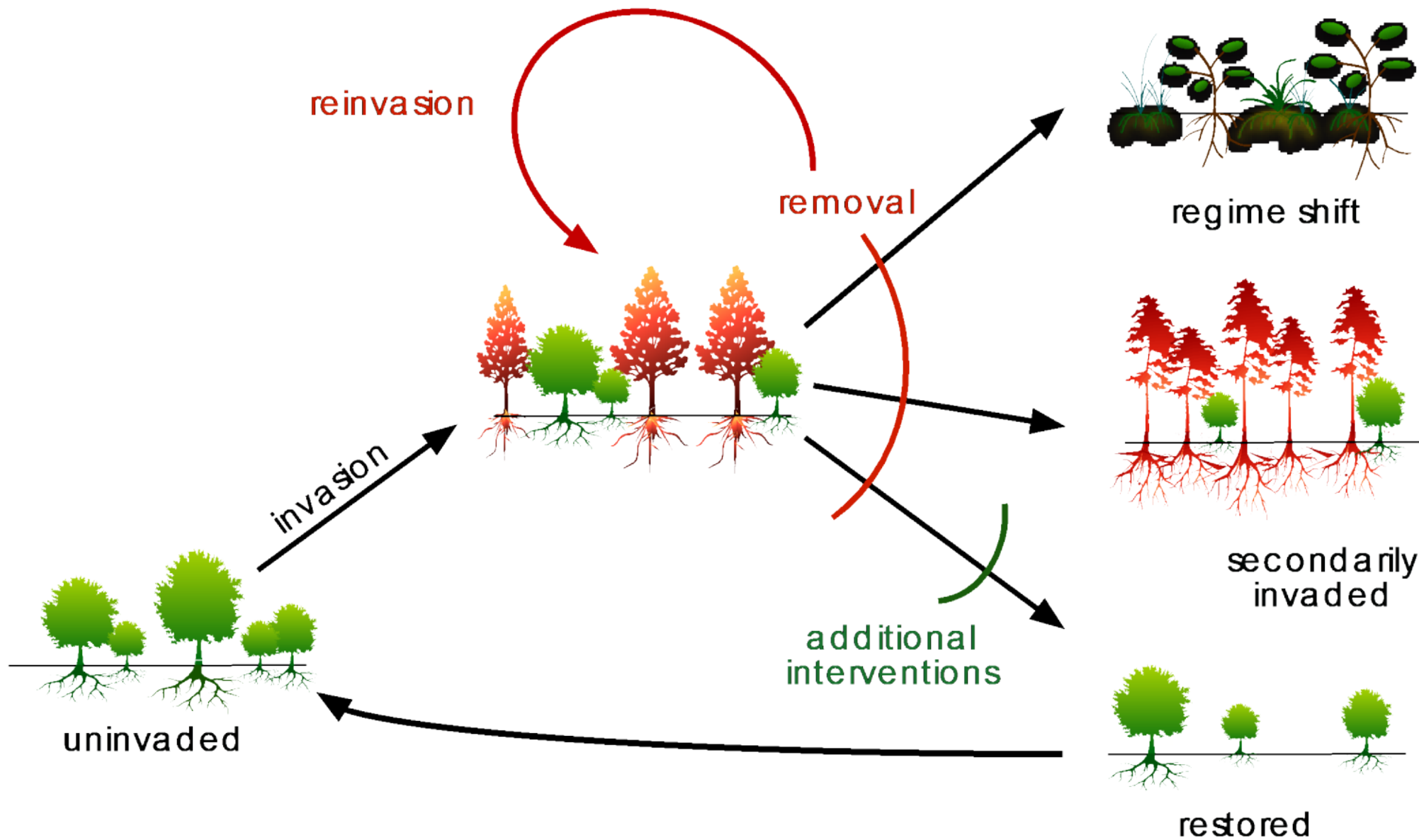
Related content



New wilding pines projects support Canterbury's recovery

Date: 11 May 2020

Three new wilding pine projects in Canterbury and a \$2M funding



What follows wilding conifer management?

Restoration or maintenance of tussock grasslands is problematic

Viable long-term options include:

(a) improved pasture,

(b) replanting to non-native trees of less-invasive species,

(c) tall woody native vegetation (large shrubs, trees).

Legacies of wilding conifers affect desired land-use outcomes and restoration practice.

Pasture



Conversion to pasture requires:

Fencing

Fertilisation or lime

Seeding

Ongoing weed and pest control

Grazing management

Usually to an economic level of stocking

Lower-risk non-native species



P. radiata underpins ca 80% of plantation forestry, but low risk isn't no risk!



SIGN IN TO

Wilding pines are an expensive-to-remove blot on Central Otago's much-lauded landscape. Photo: Supplied



FIRST PUBLISHED NOV 21, 2022
Updated Nov 21, 2022

Jill Herron
Jill Herron is a journalist based in Cromwell.

ENVIRONMENT

Hybrid tree wrongly sold as 'sterile' highlights potential wildings solution

'We can't get it wrong again' - a tree touted as a potential answer to New Zealand's wilding pine problem has been being sold as something it's not

A hybrid pine variety in huge demand has been labelled sterile and unable to spread without any evidence to support the claim.

No hardware, no hassle.
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let's find a way

RECOMMENDED READS

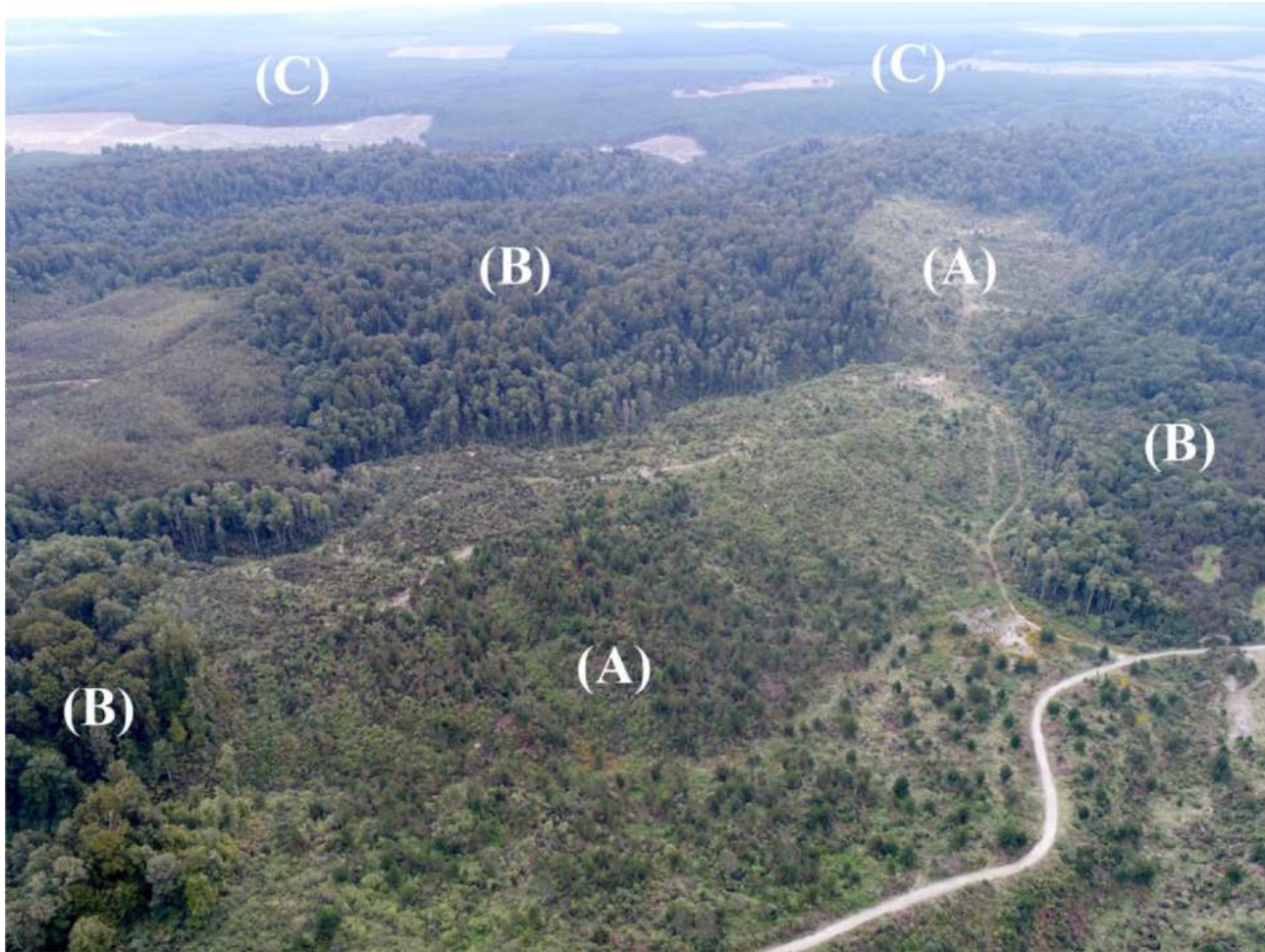
CLIMATE CHANGE

Carbon farmers feel the heat
NOV 11 2022

COMMENT

Forestry needs an urgent reset

Can you go from plantation forestry to native forest?



e.g., Ngāti Whare (Te Pua o Whirinaki Regeneration Trust) planning to convert 600 ha of plantation into indigenous forest

Major weeds include broom, blackberry, buddleja, Spanish heath

Conversion is a mixture of 'passive' and 'active' restoration approaches

Next steps...

- Better understanding and management of re-invasions (VLR MBIE programme)
- Working with the national programme on key messages and transitions
- Plant invasions interacting with disturbance and climate (e.g., proposed “weeds in a warming world”)



So, what's next?



