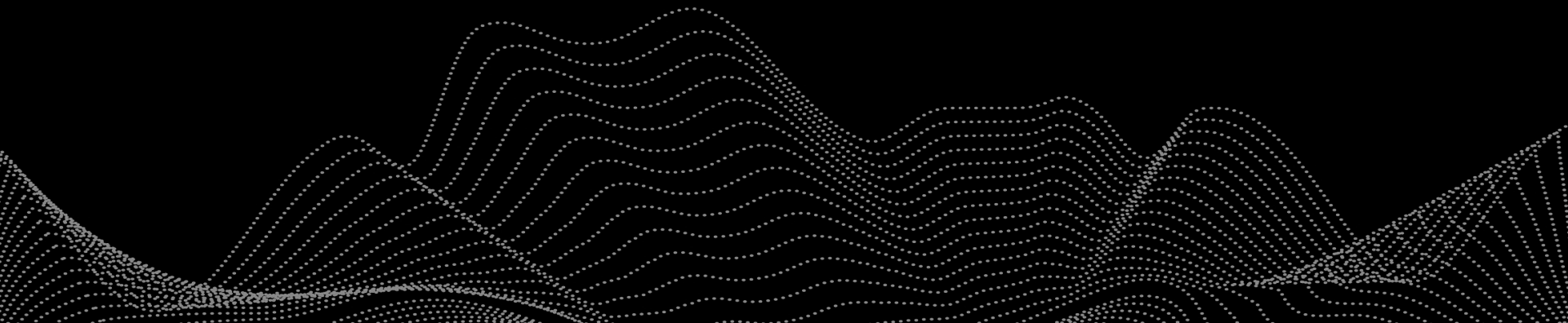




Manaaki Whenua
Landcare Research

Natural regeneration - enjoy the journey!

Fiona Carswell, Sarah Richardson, Norm Mason, Larry Burrows





Potential natural afforestation on marginal land



- National marginal land natural regeneration “probable” or “very likely”
3.4 million hectares
- Net woody gain (1990-2016)
40, 000 hectares
= **1.2% of potential** natural regeneration



Why does it matter?

Climate Adaptation!

Forest-clad marginal lands provide:

- Erosion control
- Water purification
- Nectar and pollen sources for bees
- Habitat for birds and insects
- Reservoirs of genetic biodiversity
- Cultural and social benefits





Is it suitable for everywhere?



Ben Dhu, MacKenzie Basin

Too hard



Wither Hills, Marlborough

**Interventions
Required**



Kaituna Valley, Canterbury

Can't stop it!



Where does it occur?

- Mild mean annual temperature ($\geq 9^{\circ}\text{C}$)
- Local woody cover – natural regeneration is strongly dependent on nearby forests
- Build on what's happening already!



Inland Otago



Where does it NOT occur?

Natural regeneration does NOT occur (at a sub-century time-scale) in:

- frost flats
- alpine or subalpine zones
- ultramafic soils
- geothermal sites
- gumlands
- pakihi
- podzols
- erosion pavements



Denniston Plateau, Westland



What is the process?



Grassland

< 10 years



**Grassland With
Woody Biomass**

10 – 20 years



**Short Indigenous
Forest**

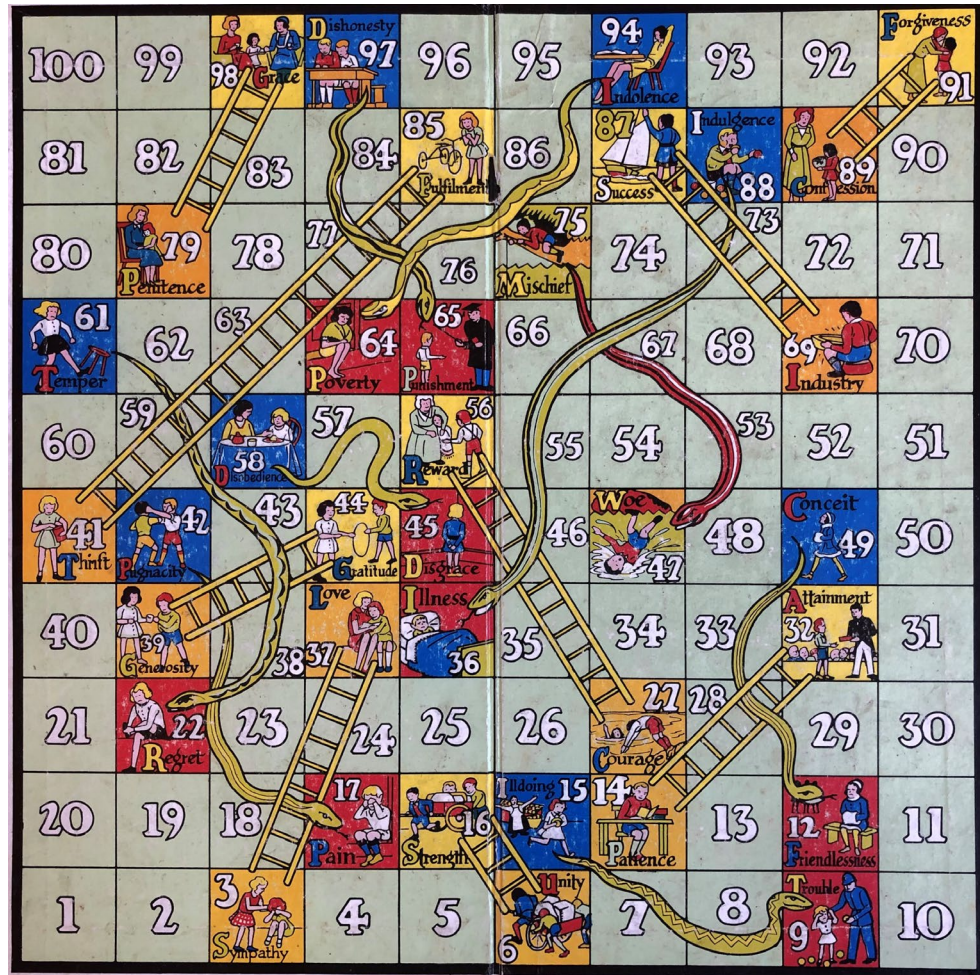
15 – 75 years



**Tall Indigenous
Forest**

75 – > 300 years

What can go wrong?





The snakes!





The Ladders

Mild temp +
Seed source =
< 30 years to
30% crown cover
(most places
nearing 100% in
this time)



Clarence Valley (south), Marlborough



Gorse and broom can be either snakes or ladders



	No. of years until tree seedlings present	Additional years until 30% crown cover of tree species
Gorse	6	10
Broom	12-15	12

Planting is just as uncontrollable!

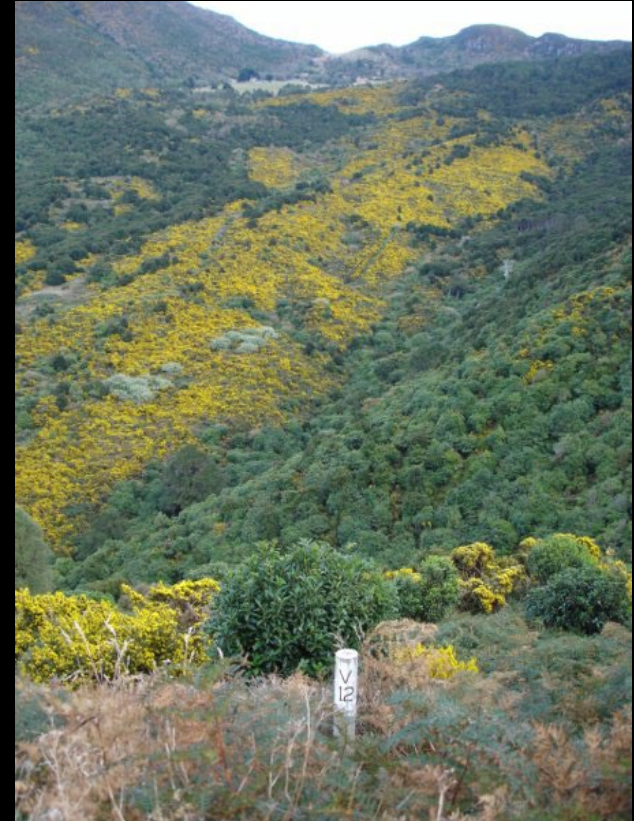




Natural diversity improves natural resilience



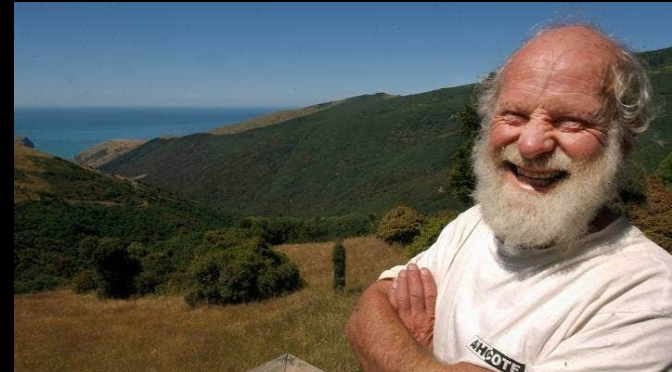
Hinewai post fire 2011





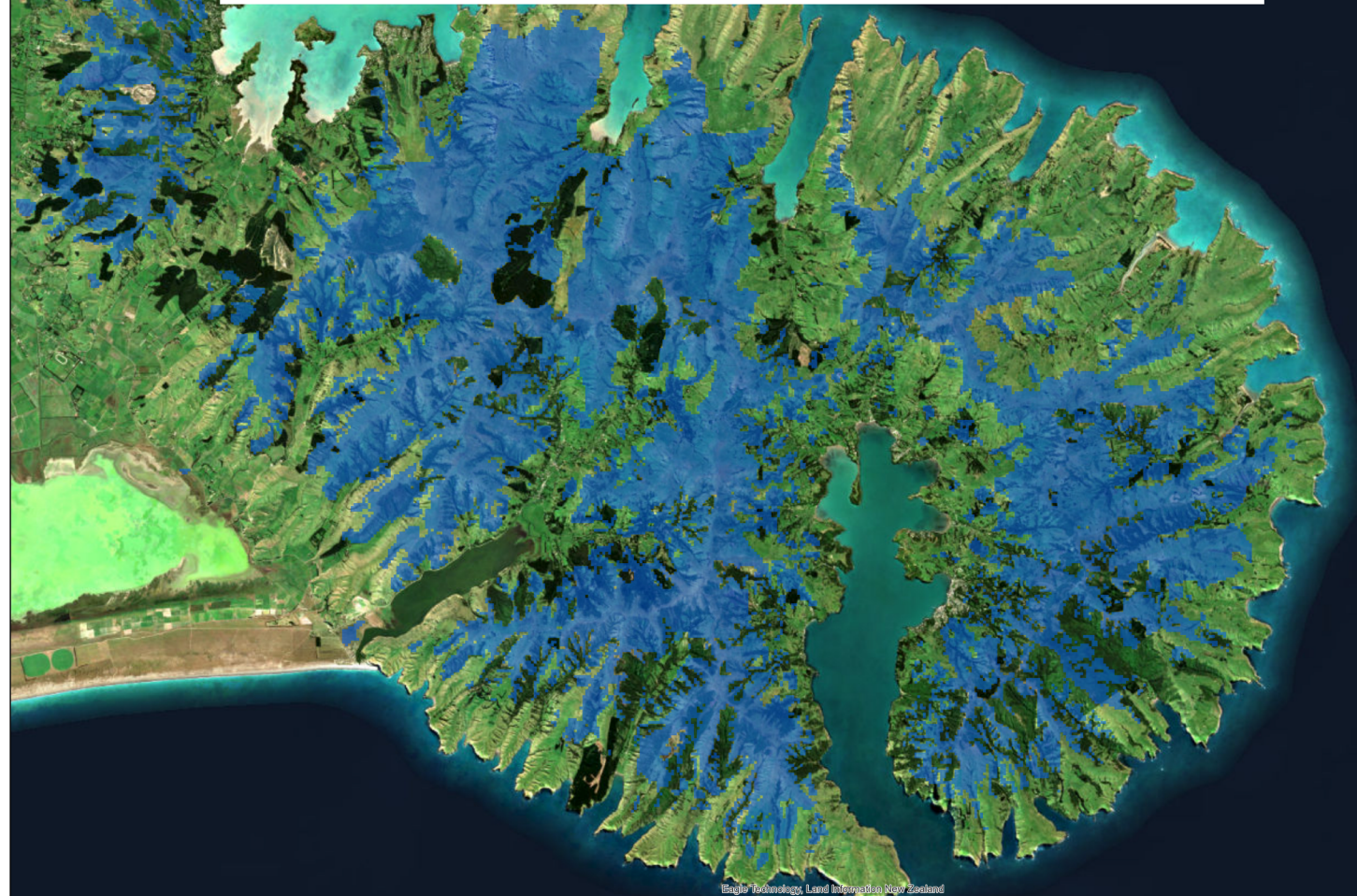
Social and ecological catalysts reinforce each other

- One pioneer (Hugh Wilson) and some fast followers
- From 109 ha in 1987 to 6,400 ha now
- Good conditions at peninsula-scale
- Self-contributing seed source
- Savings in fencing
- Savings in pest control



Picture by: Dean Kozanik, Stuff

Potential natural afforestation on marginal land





How to get there?

Human actions
supporting natural
processes

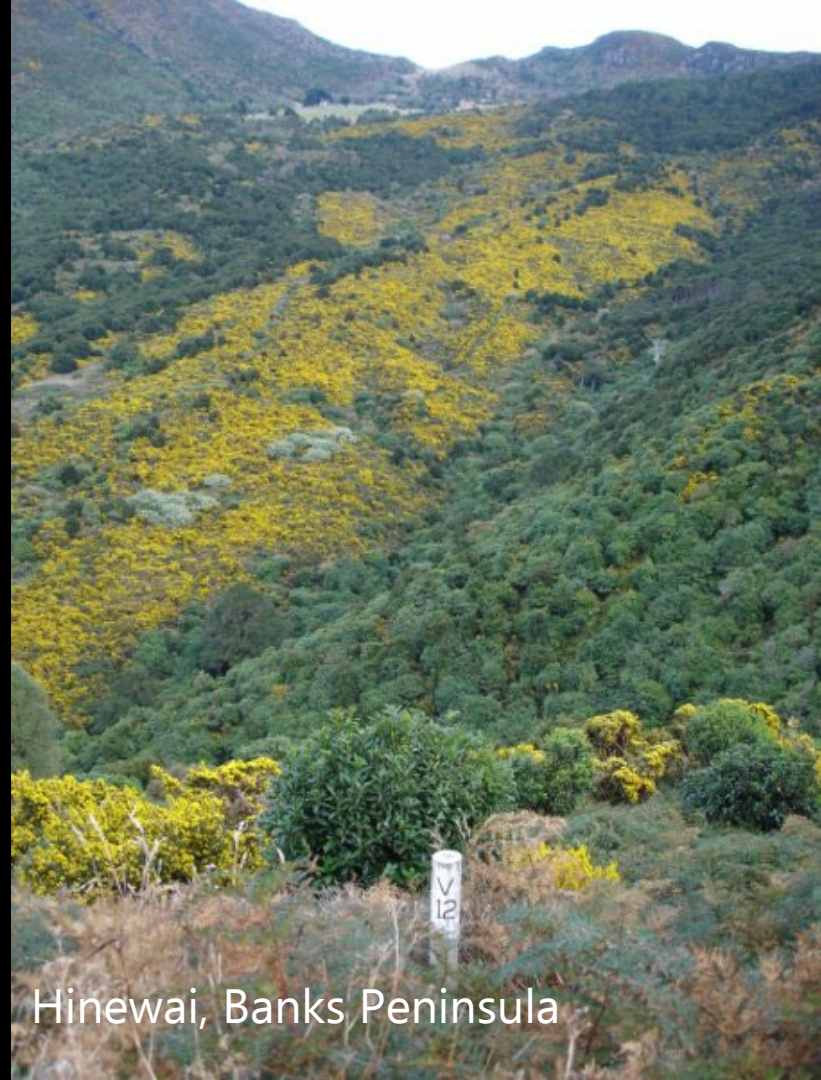
- Exclude herbivores
- Prevent fire
- Exclude problem weeds
- Add canopy species where warranted





In summary:

- It's messy!
- But it WILL get there with the right conditions and ACTIVE management
- Look for woody indigenous species already coming up in the grass to suggest it might work
- Build on what's naturally occurring
- Exclude fire and herbivores
- Enjoy the stages and changes and CELEBRATE each of them!



Hinewai, Banks Peninsula

