Landcare Research
Manaaki Whenua

It’s a pest-eat-pest world: the importance of multi-species control

Al Glen

Overview

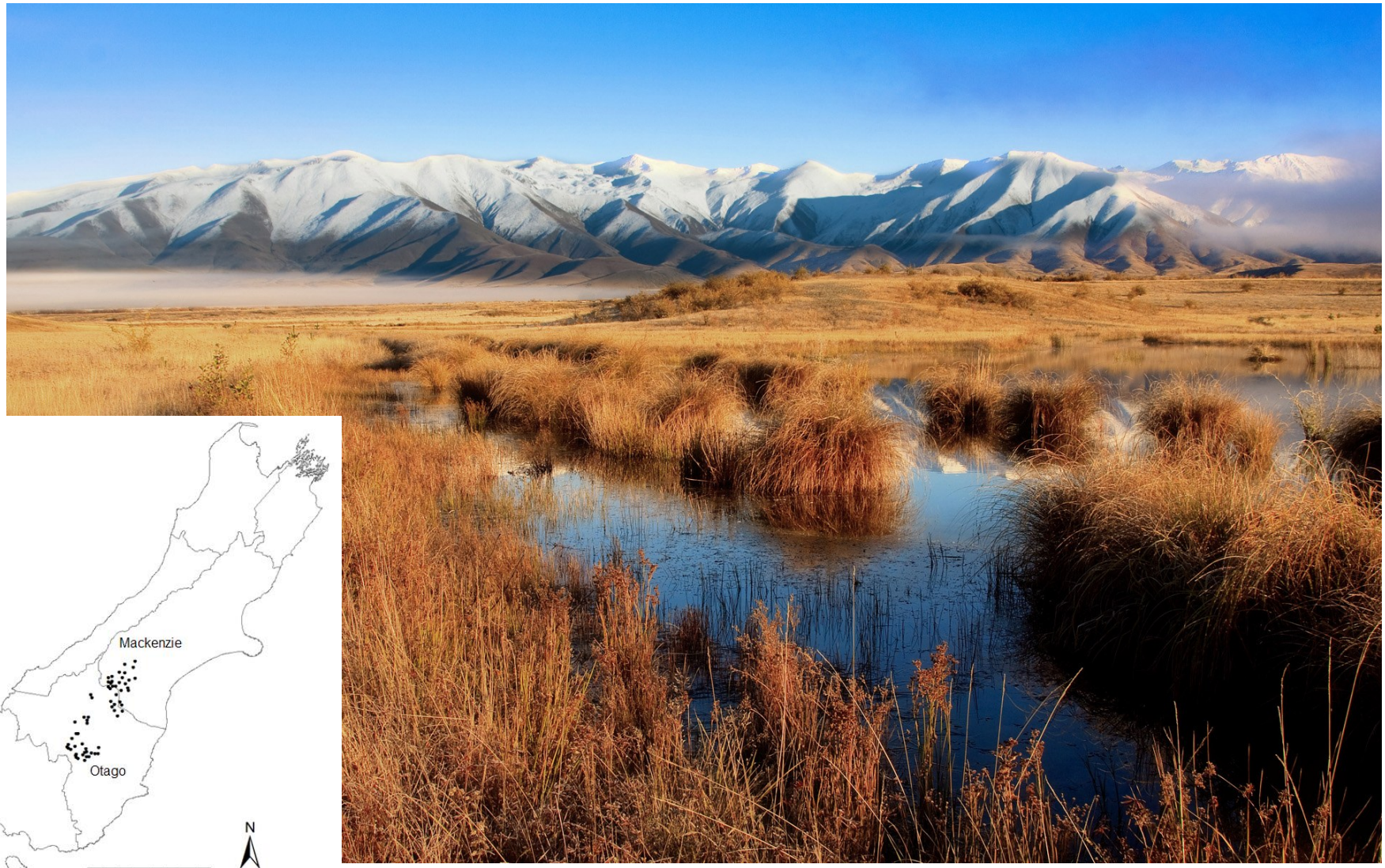
- Pest species interact with each other, e.g.
  - Rodent outbreaks cause stoats to increase
  - Rabbits support cat and ferret populations
- Single-species control can backfire
- Need a whole ecosystem approach
- This can improve ecological AND economic outcomes!

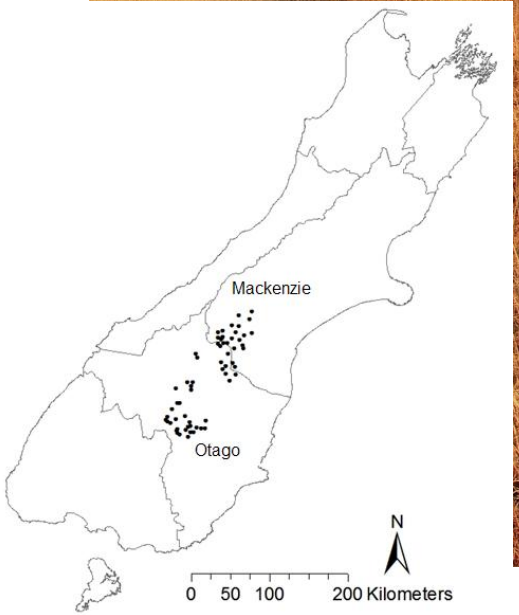
OPEN ACCESS Freely available online

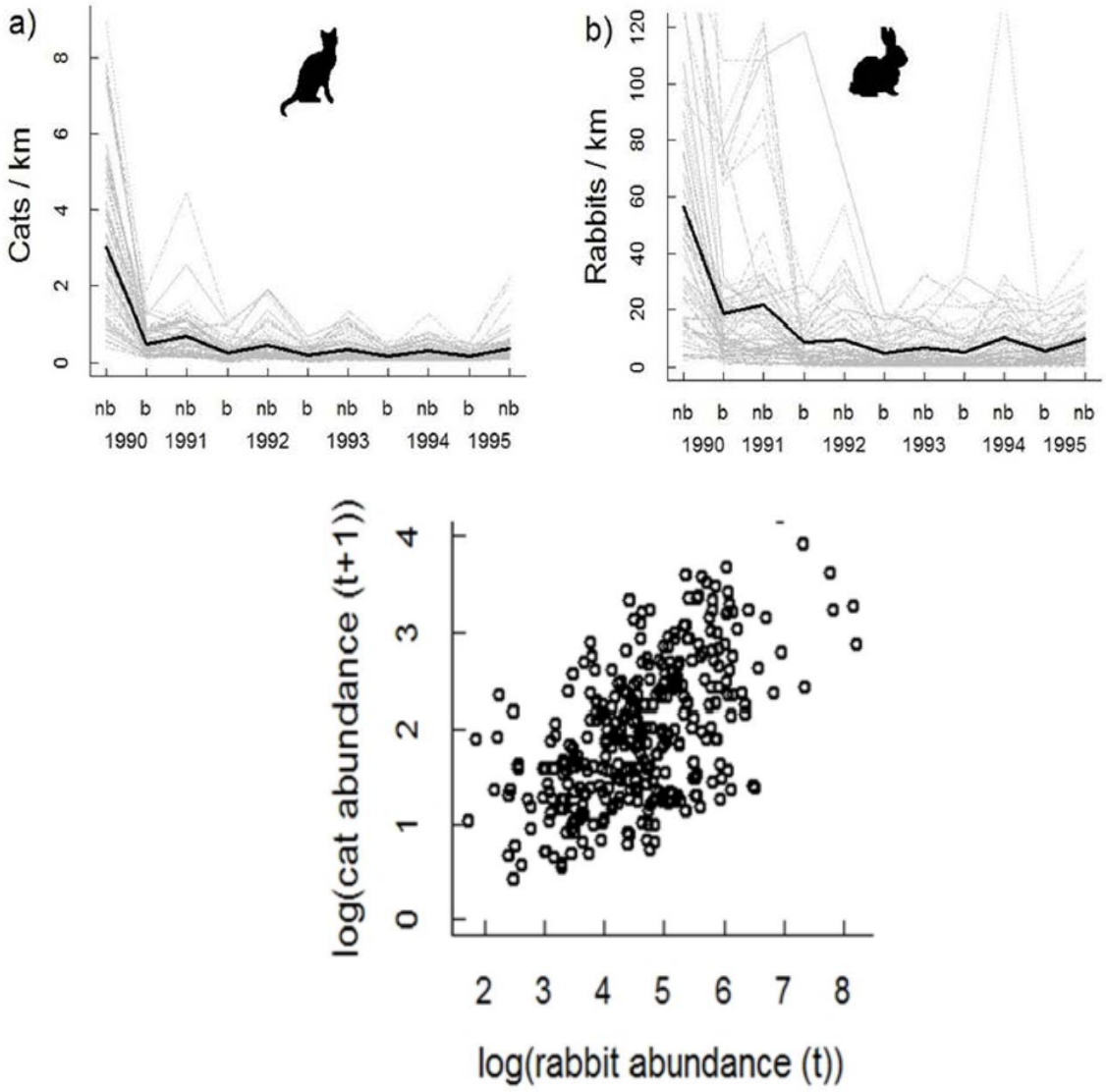
PLOS ONE

Modelling Landscape-Level Numerical Responses of Predators to Prey: The Case of Cats and Rabbits

Jennyffer Cruz*, Alistair S. Glen, Roger P. Pech





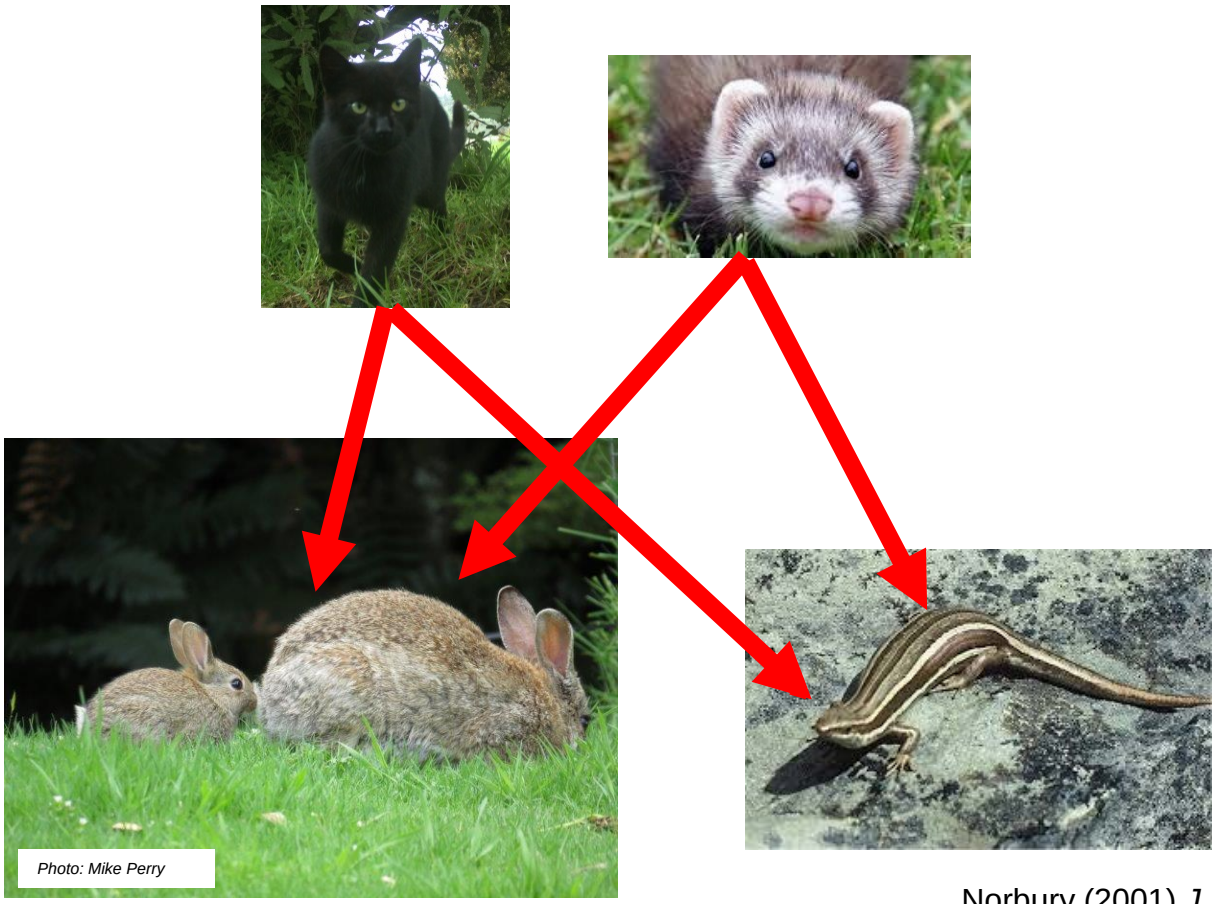

a)
Cats / km
0
2
4
6
8
nb b nb b nb b nb b nb b nb
1990 1991 1992 1993 1994 1995
b)
Rabbits / km
0
20
40
60
80
100
120
nb b nb b nb b nb b nb b nb
1990 1991 1992 1993 1994 1995
log(cat abundance (t+1))
0
1
2
3
4
2 3 4 5 6 7 8
log(rabbit abundance (t))

So…

- If you want to keep cat numbers low, control rabbits!

But there's a catch…

- Prey switching:

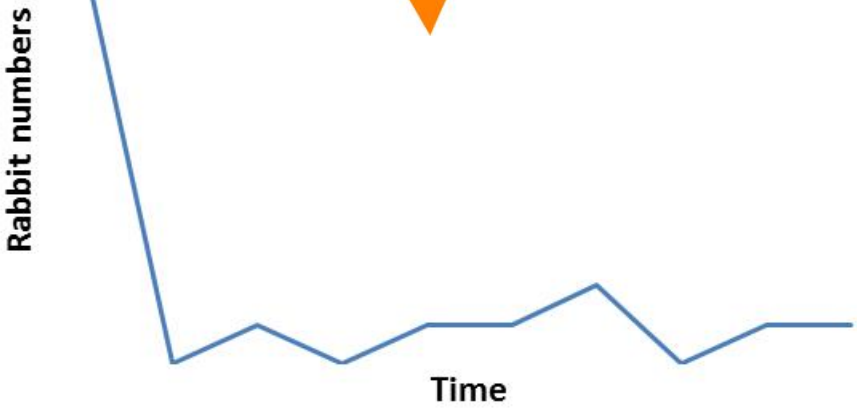


Norbury (2001) *J. Appl. Ecol.*

How do we avoid this?

1. Control rabbits AND predators at first…
2. Keep rabbit numbers down; predator numbers will not recover

THIS



…NOT THIS

But wait, there’s more!

Cost-benefit analysis*

- Rabbits ate the equivalent of 6–18 ewes/ha
- Loss of income = $620–1750/ha/yr
- Average cost of rabbit control: $43/ha/yr
- Net benefit: $577–1707/ha/yr
  - = $250,000–$750,000/yr for an average sized NZ sheep farm

*Thanks to Mike Perry

Additional benefits

- Market advantage of ‘green credentials’

- Eliminate toxoplasmosis

Summary

- Huge economic gains from keeping rabbits at low abundance
  - Direct gains: increased pasture availability
  - Indirect gains: fewer predators
- Multi-species approach for initial knockdown
- Little or no predator control may be needed afterwards
- Win-win situation for agriculture and biodiversity


Any
questions?