



National-scale pest eradication requires greater understanding and integration of multiple impacts

Duane A. Peltzer

Manaaki Whenua Landcare Research

New Zealand's Biology Heritage National Science Challenge - *Ngā Koiora Toku Iho*

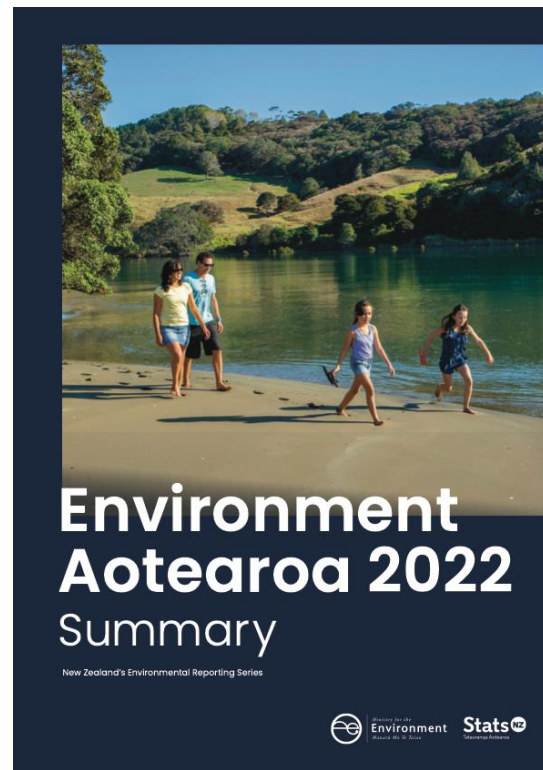
Four interlinked issues must be addressed for PFNZ 2050 to achieve its goal:

- (1) improved ecological understanding of interactive effects;
- (2) refinement and development of operational methods;
- (3) overcoming social and bioethical challenges;
- (4) improving governance and partnerships with Māori.



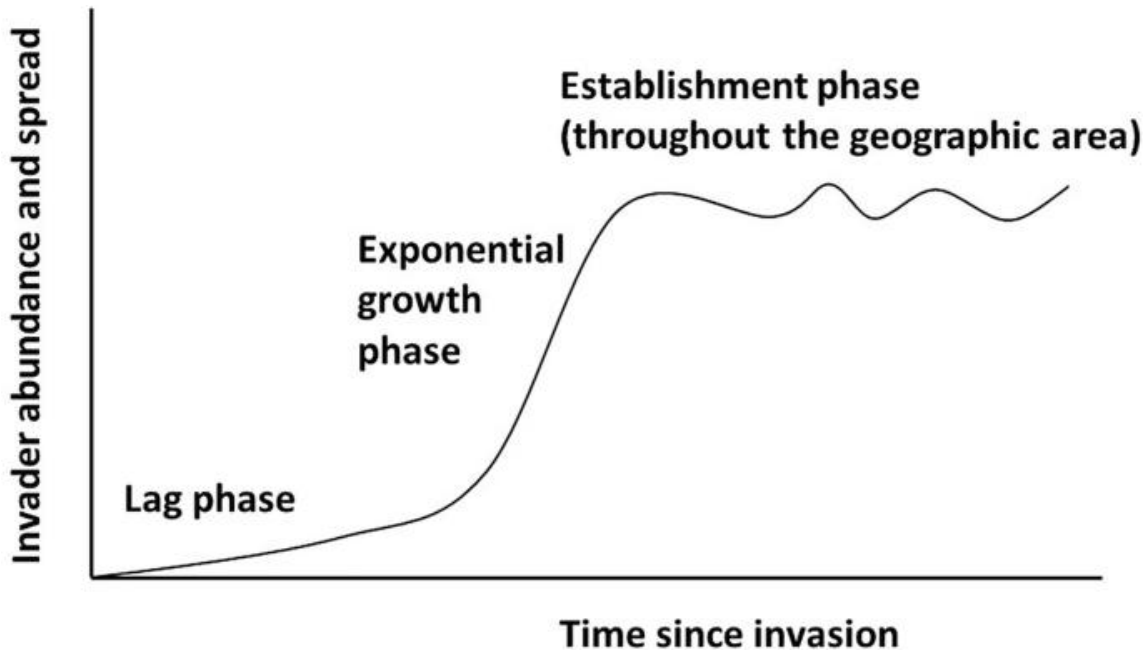
TOWARDS A
PREDATOR FREE 2050

The value of ecosystems and 'natural capital' for our wellbeing is widely appreciated in science, policy and reporting



Biological invasions are a major component of global change

- Most mammals and half our flora are non-native species
- An ecological view of 'impact' is $f(\text{distribution, abundance, effect})$

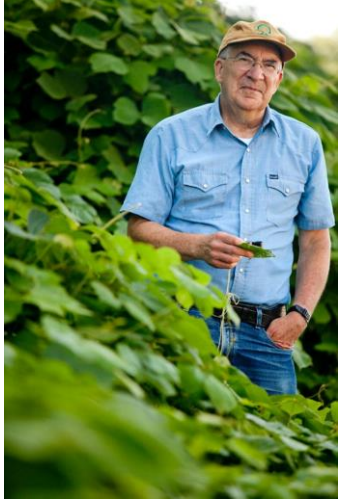




“Her book provides abundant evidence that the main negative consequences of mustelid introductions were in fact predicted, loudly and repeatedly... government agencies can do or facilitate risky things in the face of credible advice.”



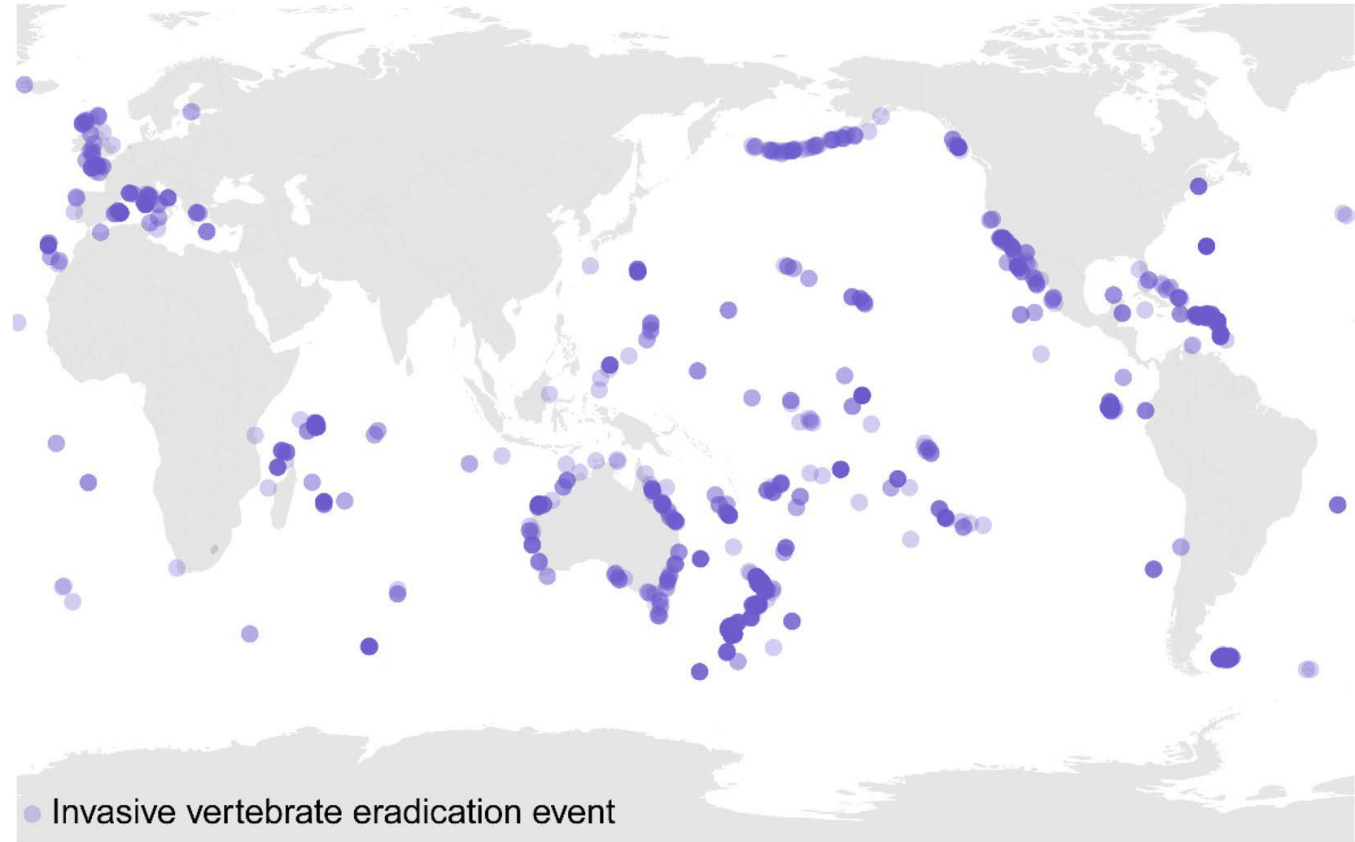
NZ is a global leader in large-scale conservation management



New Zealand as a leader in conservation practice and invasion management

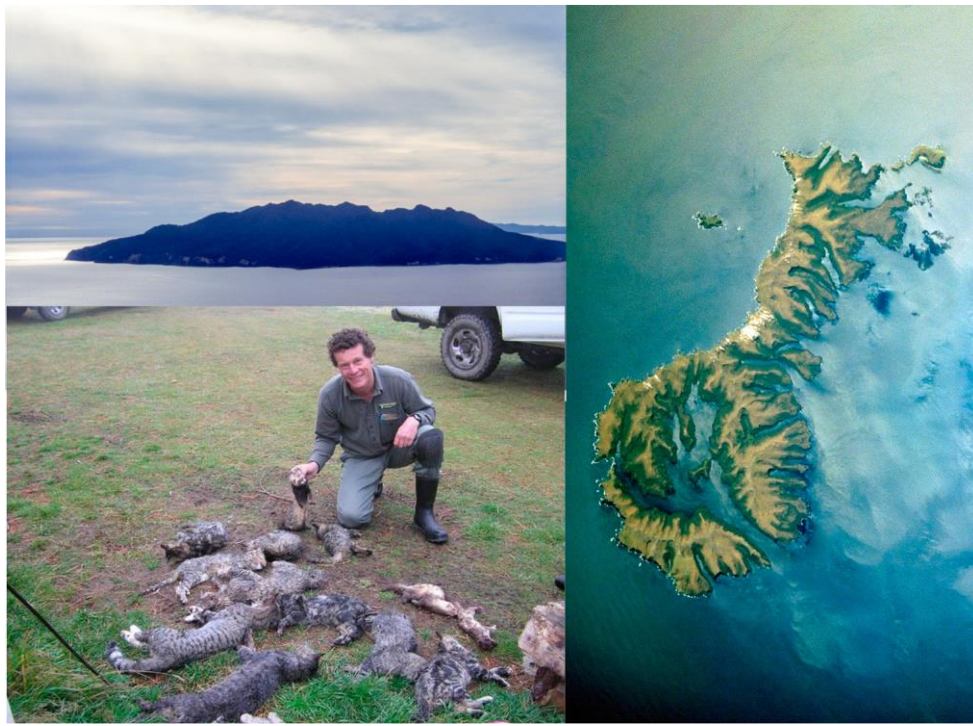
Daniel Simberloff

2019 J. Royal Soc. NZ 49:259



Spatz et al. 2022 Scientific Reports 12:13391

Sir Paul Callaghan described the idea as New Zealand's "crazy and ambitious Moonshot" when describing the idea of PFNZ in 2012



THE BIG KILL

New Zealand's crusade to rid itself of mammals.

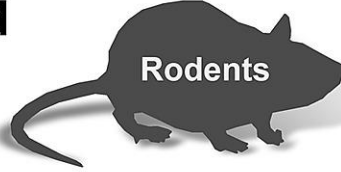
BY ELIZABETH KOLBERT

Rats and other invasive mammals are destroying New Zealand's native fauna. A quarter of native birds are extinct. The kiwi is threatened. What can be done? "Conservation is all about killing things," a volunteer coordinator said.

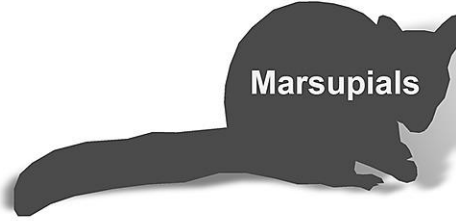
PHOTOGRAPH BY STEPHEN DUPONT



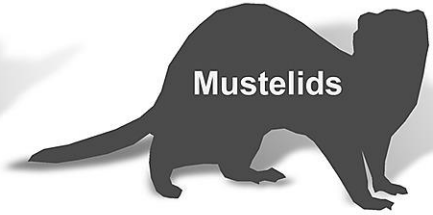
Predator-Free New Zealand



Ship rat, *Rattus rattus*
Norway rat, *R. norvegicus*
Pacific rat, *R. exulans*
House mouse, *Mus musculus*

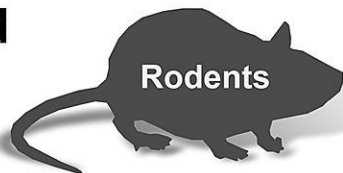


Brushtail possum, *Trichosurus vulpecula*

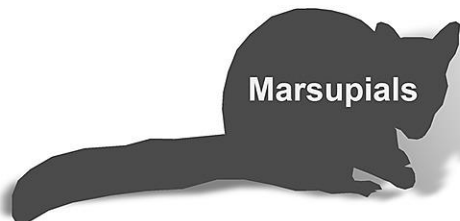


Ferret, *Mustela furo*
Stoat, *M. erminea*
Weasel, *M. nivalis*

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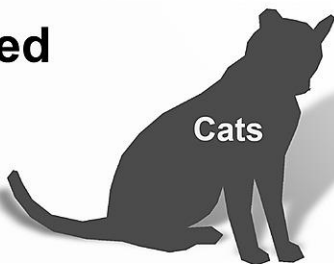


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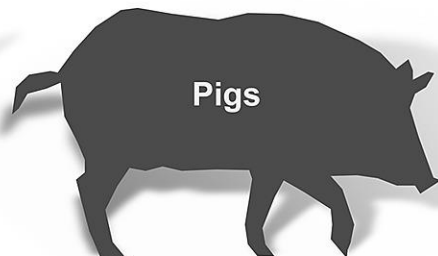


Ferret, *Mustela furo*
Stoat, *M. erminea*
Weasel, *M. nivalis*

Not included



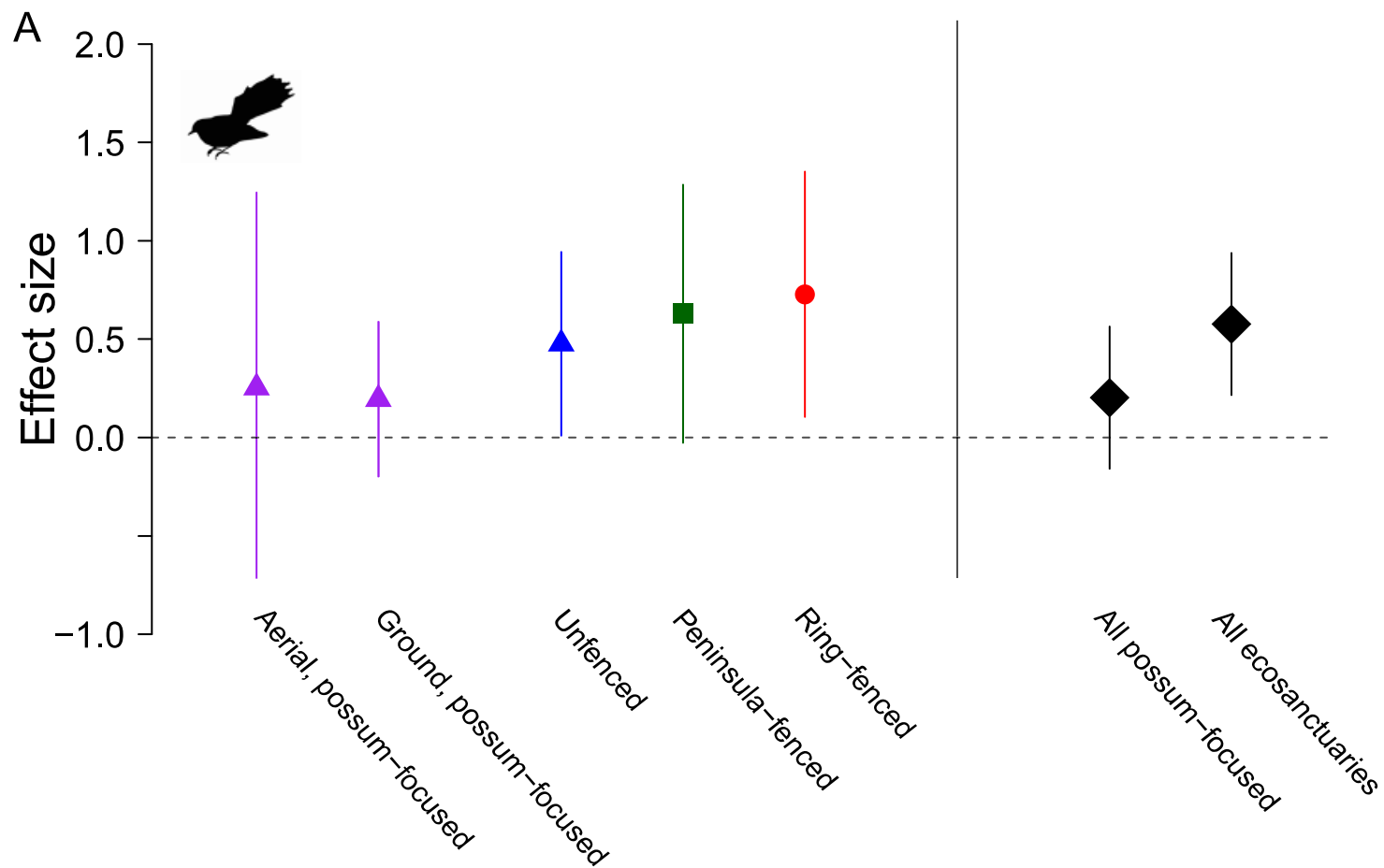
Feral cat, *Felis domesticus*



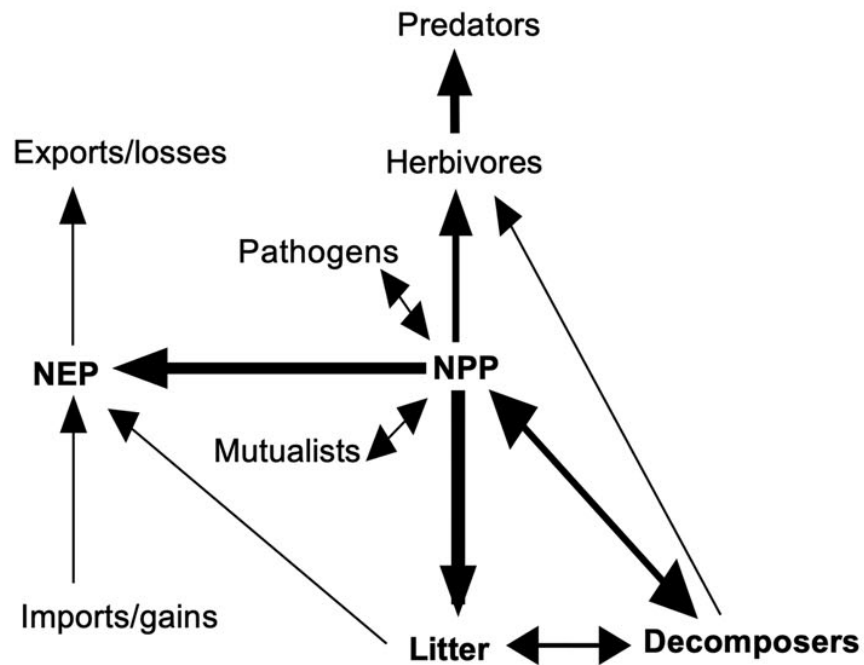
Feral pig, *Sus scrofa*

OTHERS...

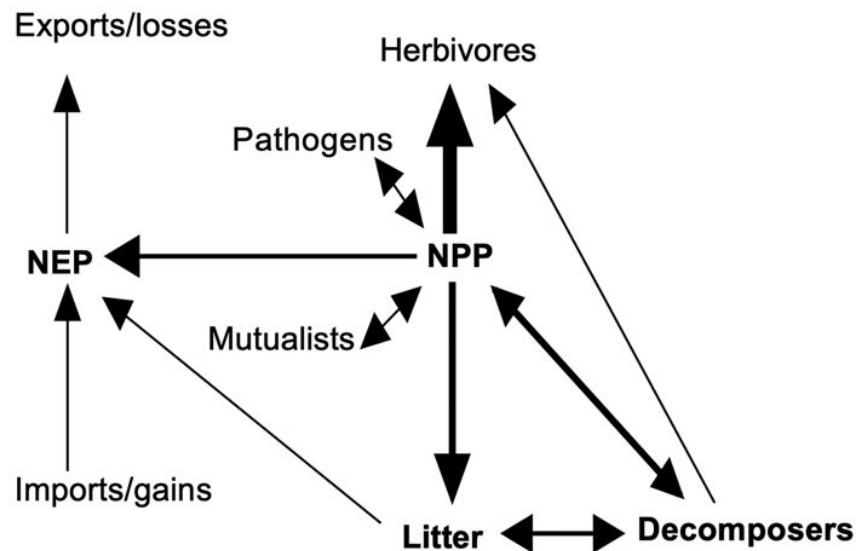
Brown trout, *Salmo trutta*
Rainbow trout, *Oncorhynchus mykiss*
Wasps, *Vespula* spp.
Hedgehog, *Erinaceus europaeus*
Native predators (e.g. falcon)



A) with predators



B) predator-free

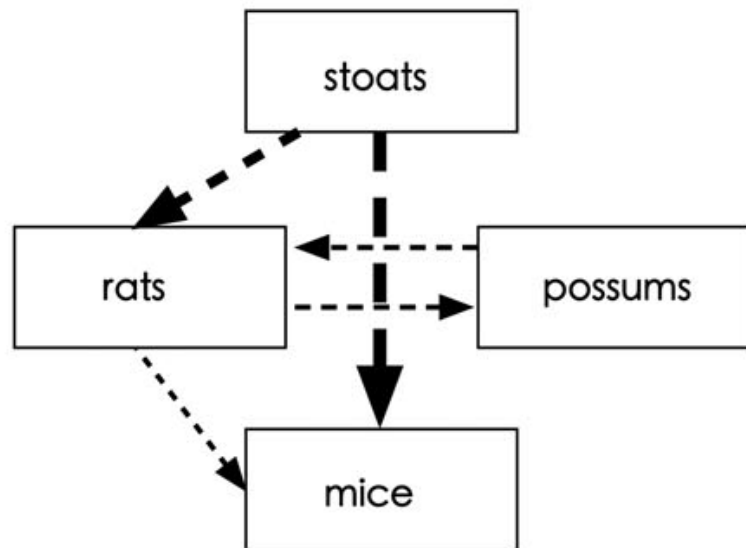


Islands, seabirds and rats

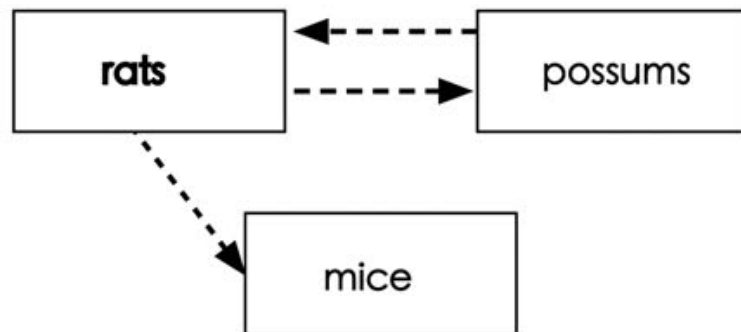


Seabird burrows on forest floor

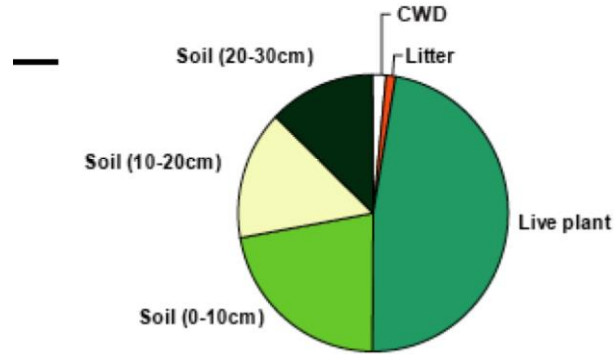
with predators



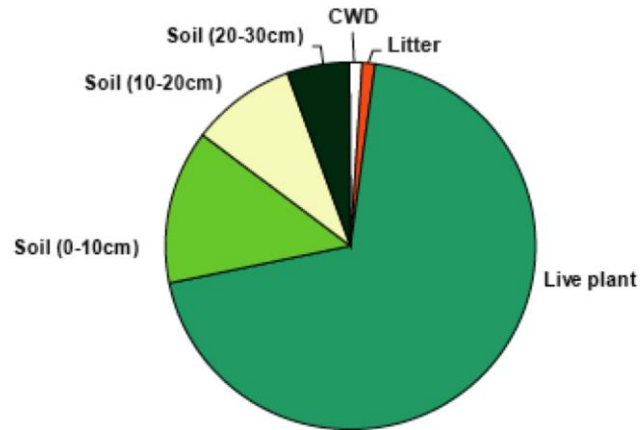
without stoats



RAT FREE (Total C=10.0kg/m²)

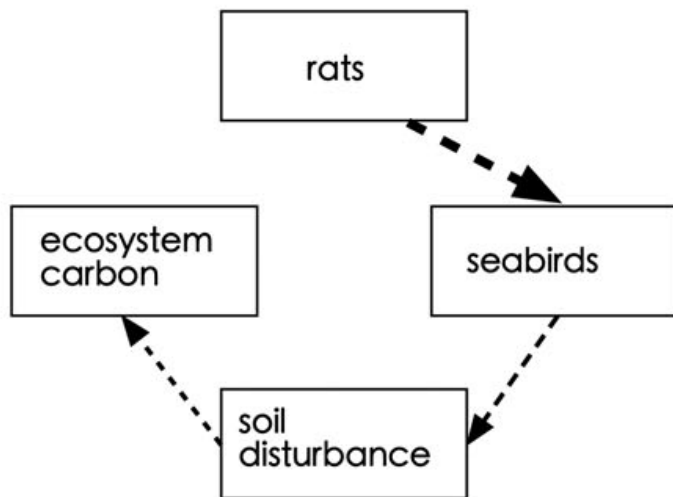


RAT INVADIED (Total C=13.7kg/m²)

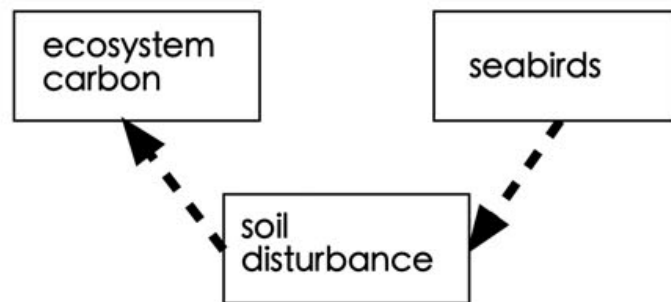


A)

with predators

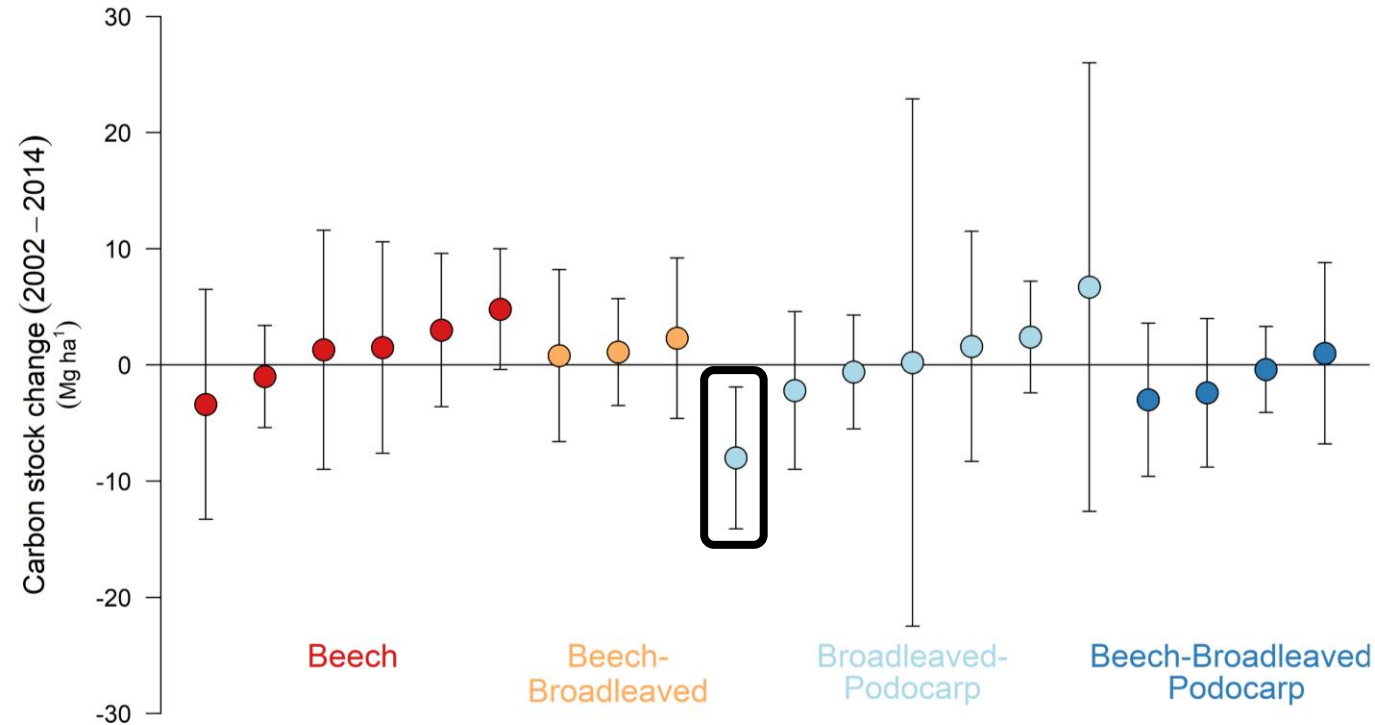


without predators



R)

Do biological invaders affect carbon in native forests?





A mature douglas fir can produce 20,000 seeds a year. Photo: Getty Images



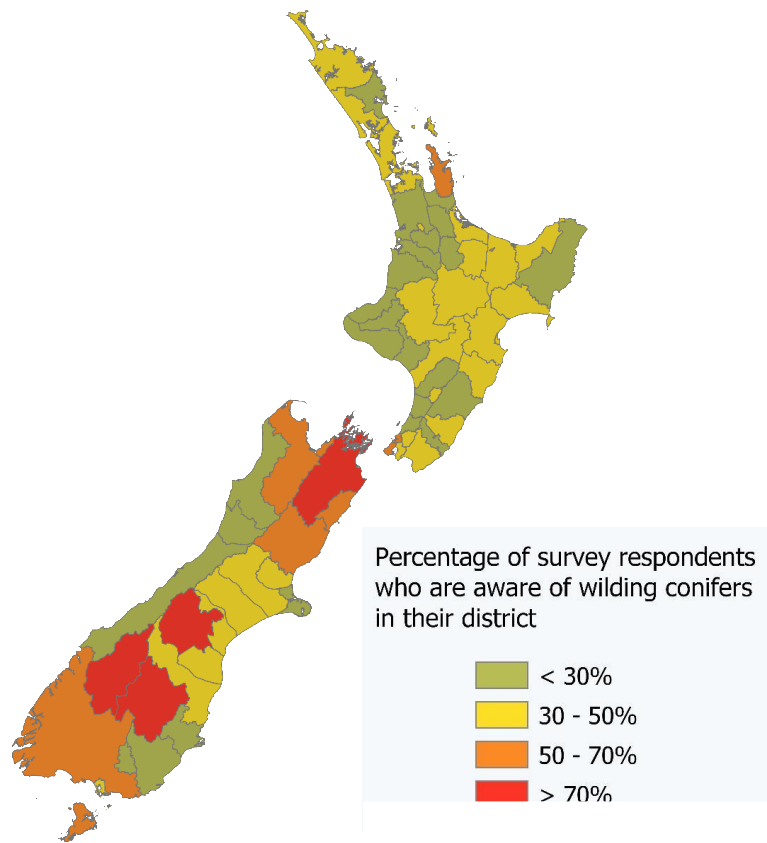
Farah Hancock

Farah Hancock is a Newsroom reporter based in Auckland who writes on conservation, technology and health.

ENVIRONMENT

NZ's super-sized weed problem

Awareness of wilding conifers varies among regions



WILDING CONIFER CONTROL

Giving our native species room to breathe



New Zealand Government

Growing view that wildings are harmful

	More harmful than beneficial	Neutral	More beneficial than harmful
2015	67.3%	-	22.7%
2017	64.8%	14.1%	7.0%
2019	78.4%	9.9%	3.5%



How do we collectively improve biological heritage?

Whakamana · Empower

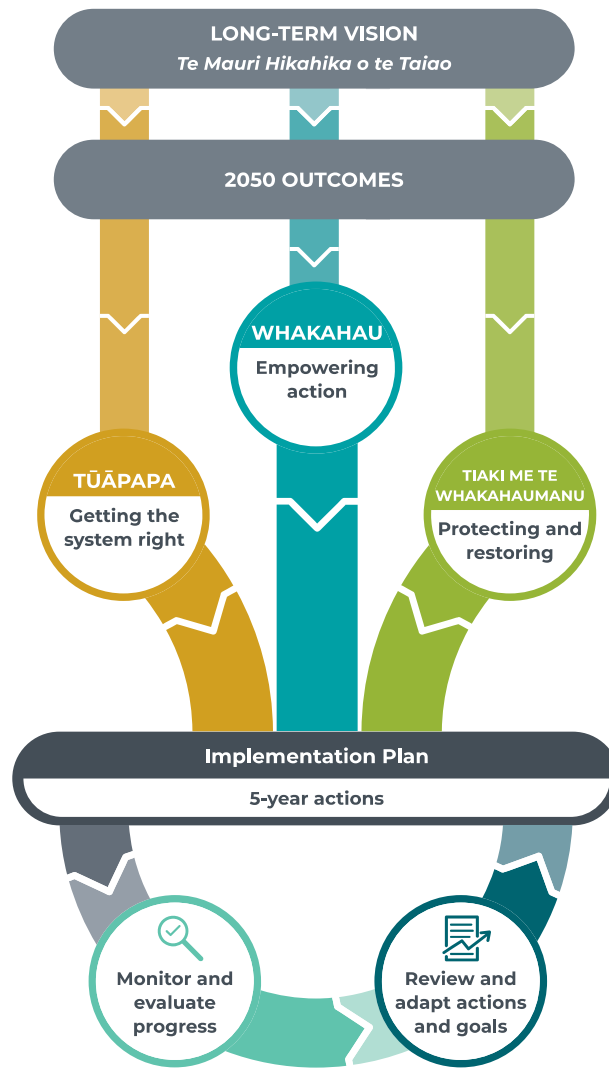
Tiaki · Protect

Whakahou · Restore

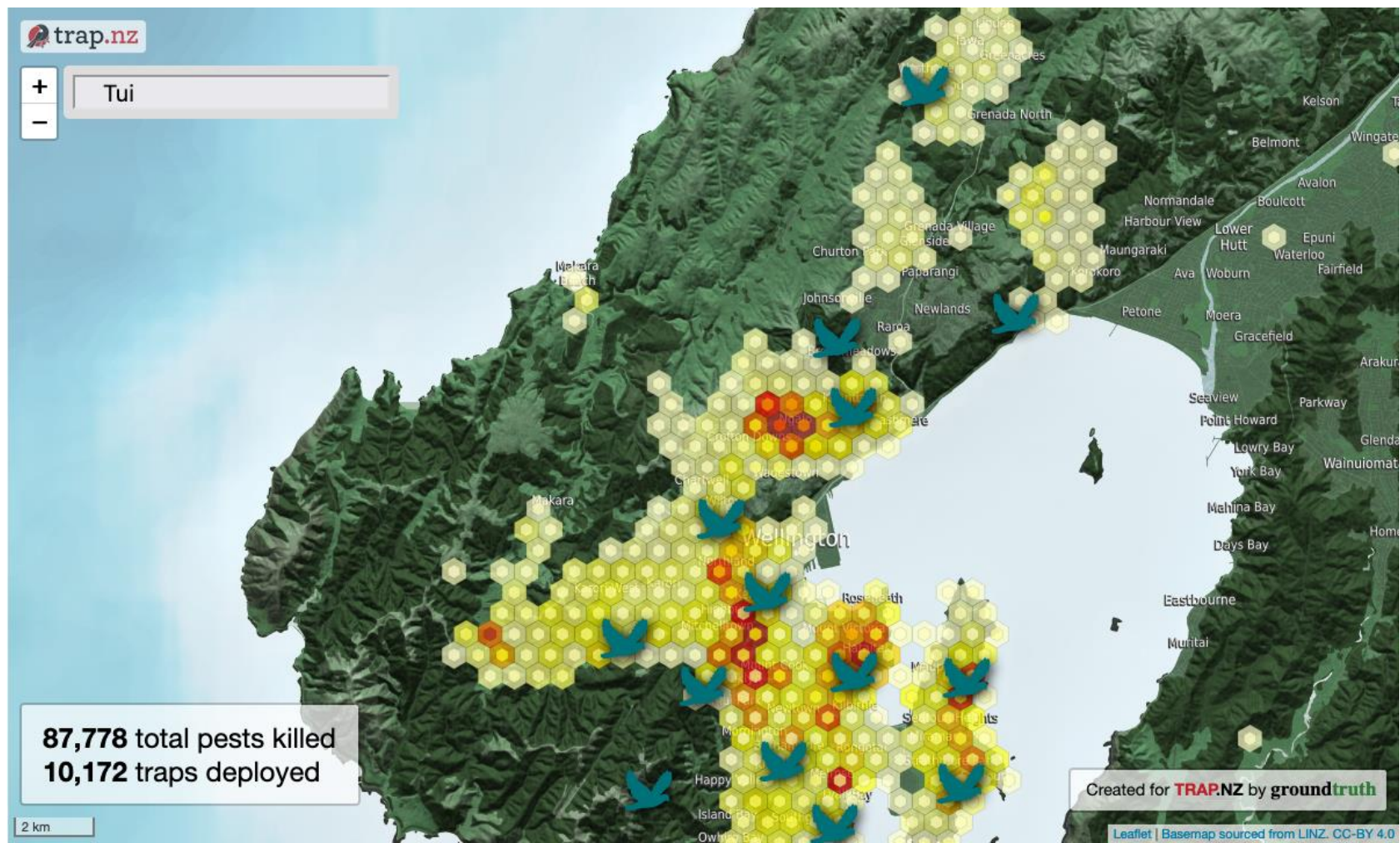




Te Mana o te Taiao



- Modelled partly after BioHeritage Challenge
- System-level changes anticipated
- Investment case in 2022 includes PFNZ activities and collective management



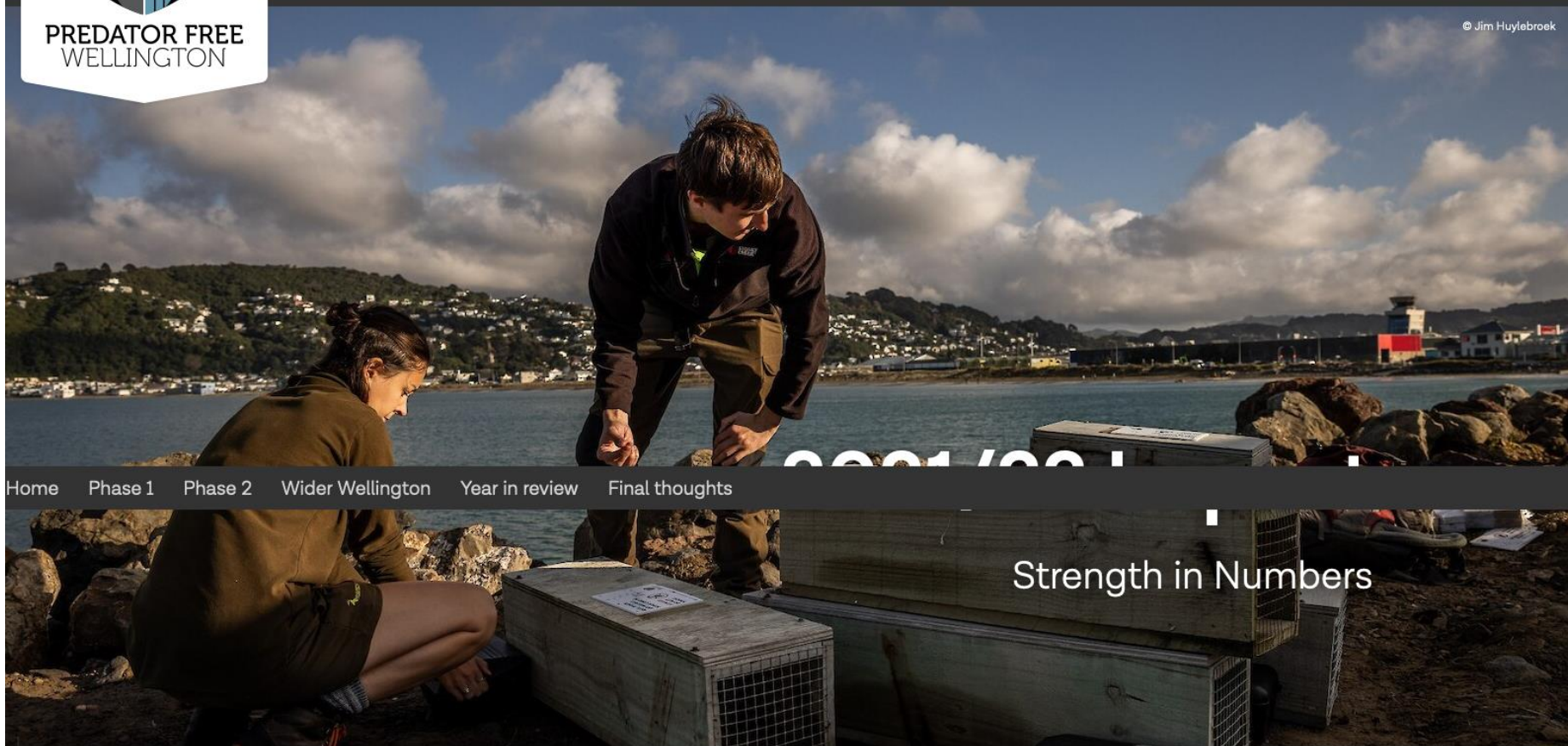


PREDATOR FREE
WELLINGTON

2021/22 Impact Report

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Strength in Numbers

<https://www.pfw.org.nz/2021-22-impact-report/>