How could eDNA as a surveillance tool help achieve mammalian pest elimination?

Marissa Le Lec* Nick Foster Nick Mulgan Tom Agnew

ZIP
ZERO INVASIVE PREDATORS
Enabling a new future

Img: Ngā manu

Img: Ngā manu


Img: Ngā manu


Img: Ngā manu

1. The field site

2. Current approach to surveillance
   and what we want eDNA to do

3. Overview of trials so far

4. A future application

Session 13, this afternoon: Nick Foster

Img: Ngā manu

Img: Ngā manu

North Ōkārito
November 2024

Whataroa
Farmland

Ongoing
ground-based
work

South Ōkārito
April 2022

Price
December 2023

Whataroa - Perth
July 2019

Burster
August 2023

Whataroa - Butler
July 2021

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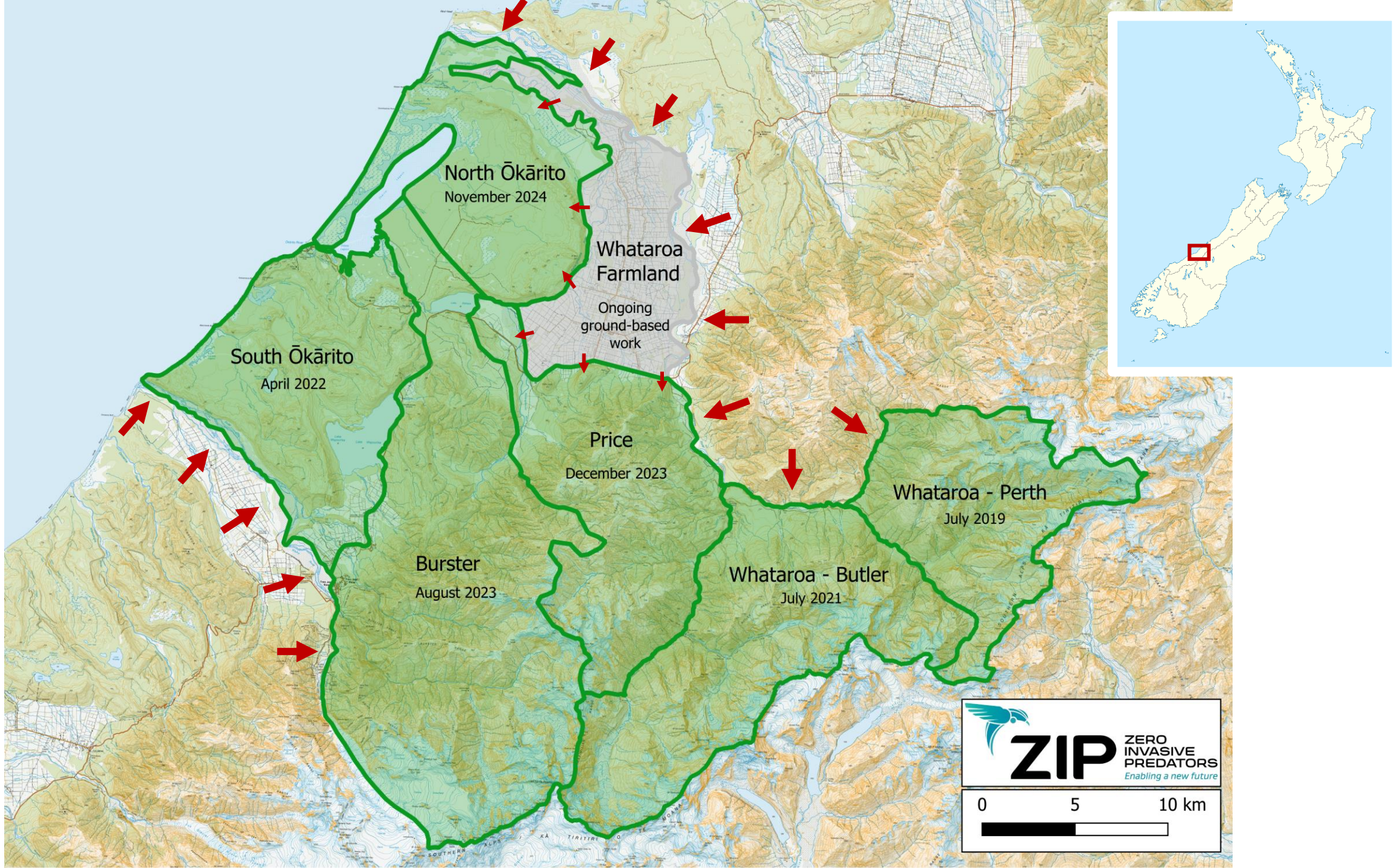
0 5 10 km


North Ōkārito
November 2024
Whataroa Farmland
Ongoing ground-based work
South Ōkārito
April 2022
Price
December 2023
Whataroa - Perth
July 2019
Burster
August 2023
Whataroa - Butler
July 2021
ZIP
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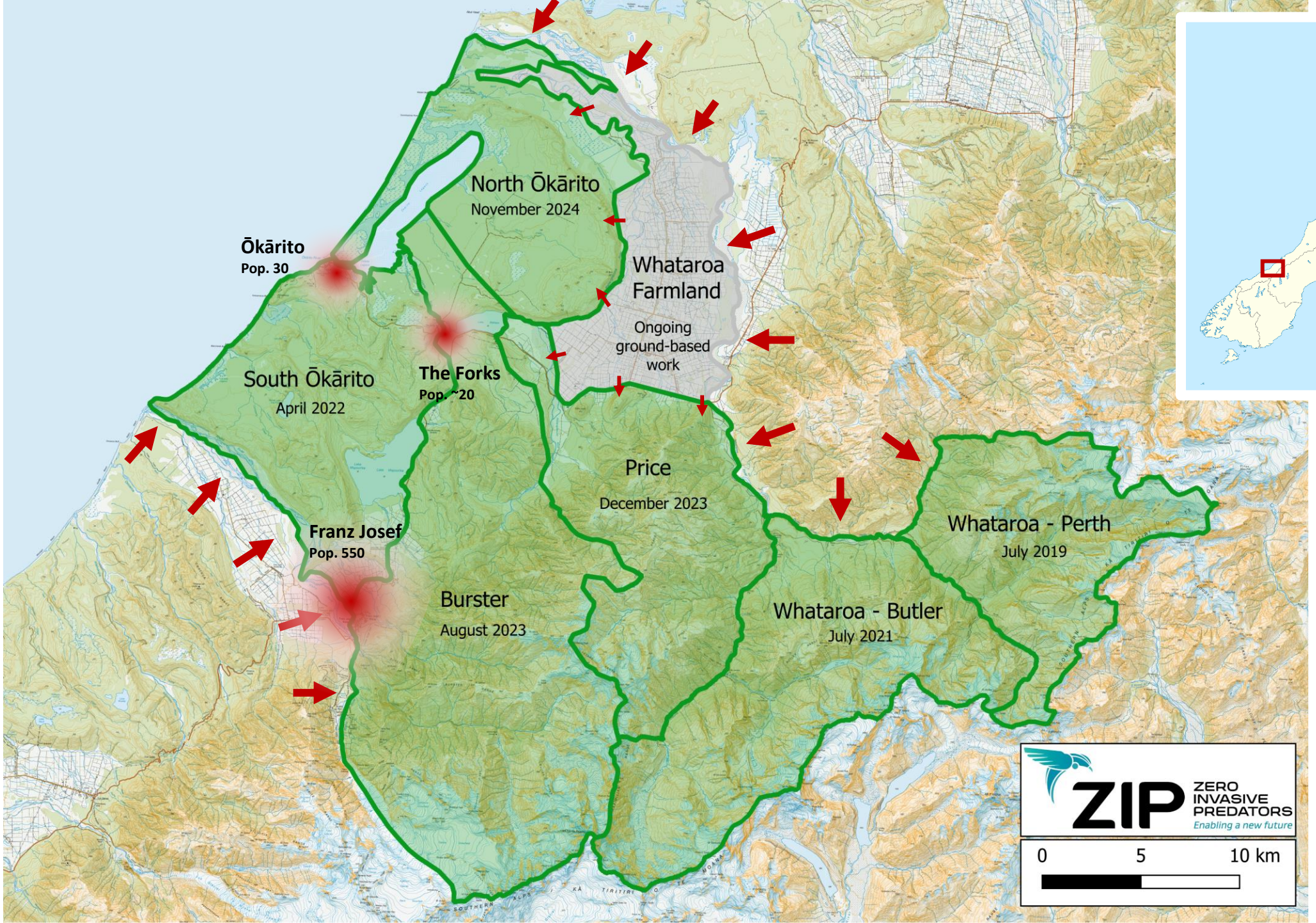
0
5
10 km


North Ōkārito
November 2024
Ōkārito
Pop. 30
Whataroa Farmland
Ongoing ground-based work
South Ōkārito
April 2022
The Forks
Pop. ~20
Price
December 2023
Whataroa - Perth
July 2019
Franz Josef
Pop. 550
Burster
August 2023
Whataroa - Butler
July 2021
ZIP
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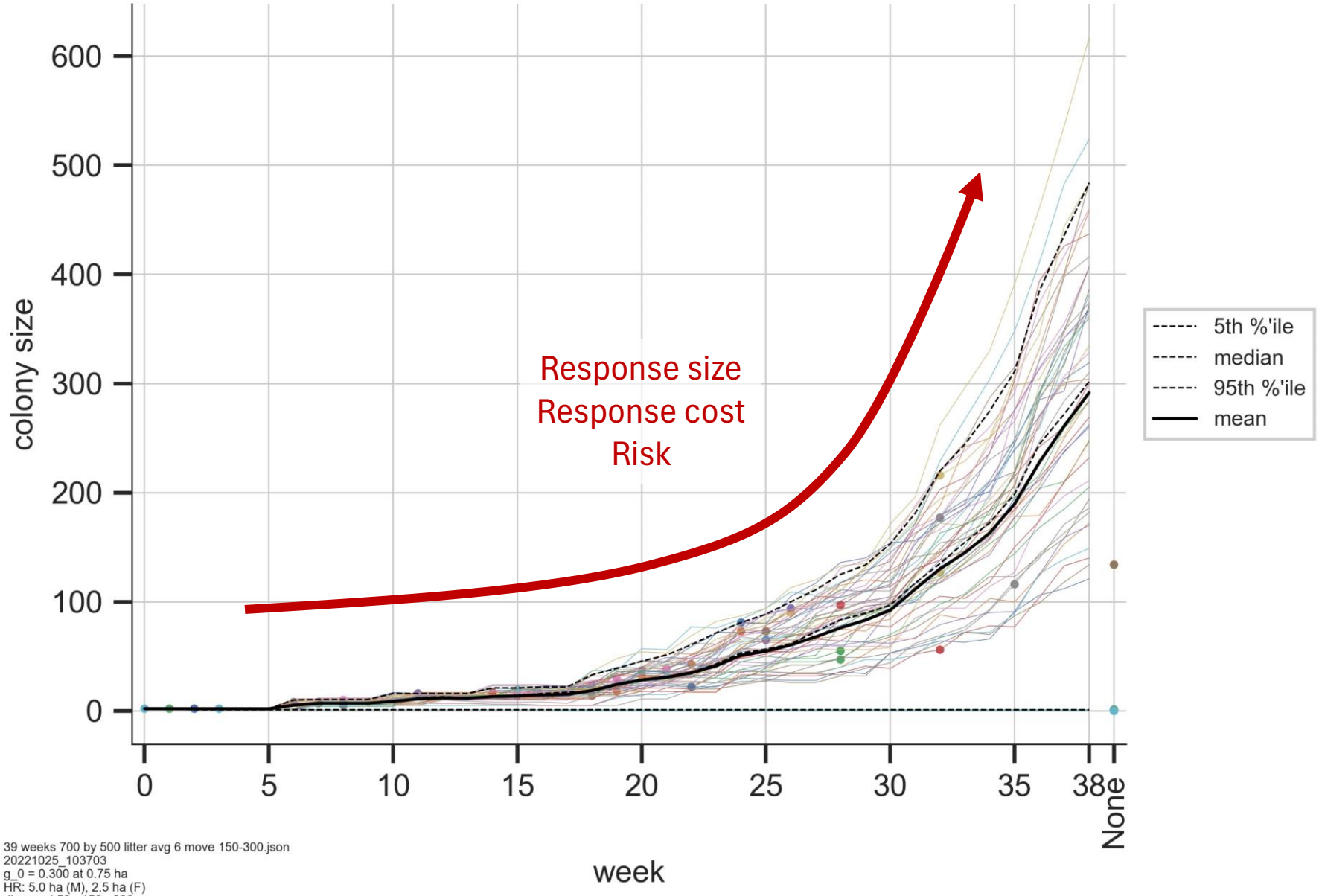
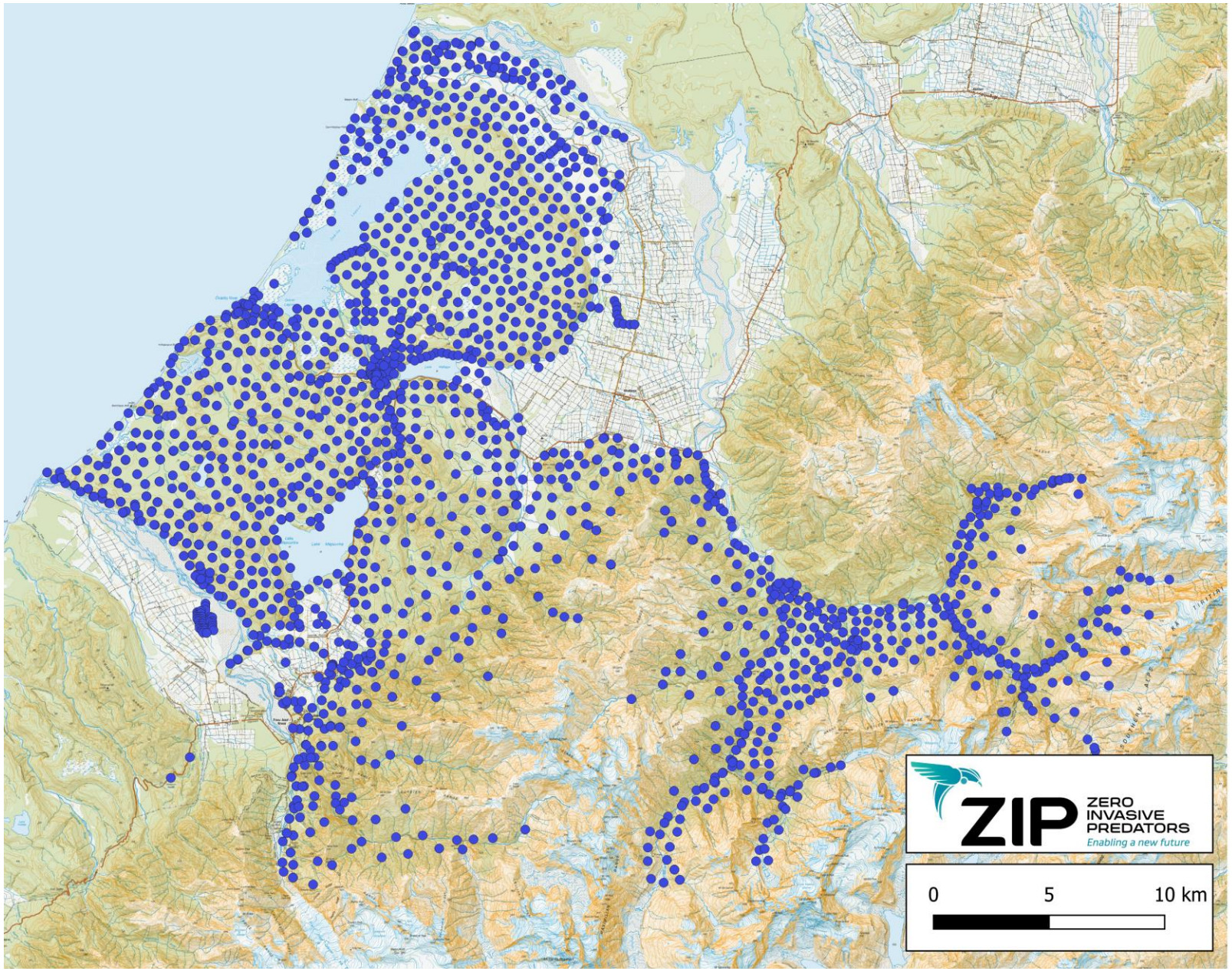
0
5
10 km

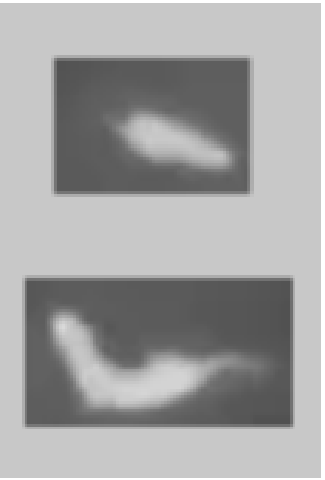
Growth of Population with First Detection



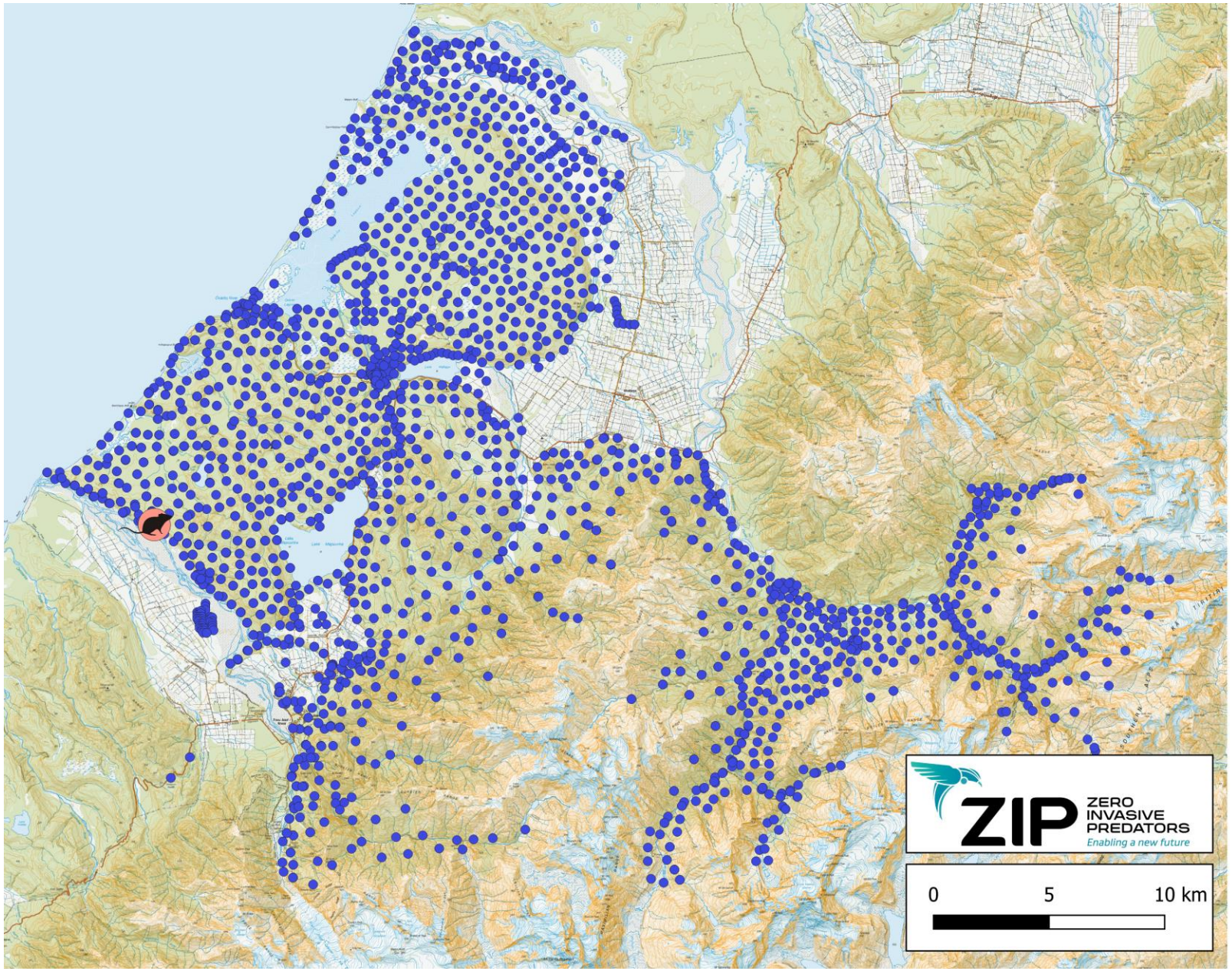
39 weeks 700 by 500 litter avg 6 move 150-300.json
20221025_103703
g_0 = 0.300 at 0.75 ha
HR: 5.0 ha (M), 2.5 ha (F)
dispersal 50 - 150 - 300 m
litter 0 - 6 - 10
adult survival 0.500 p.a.



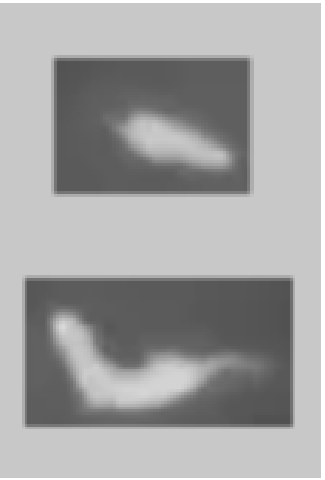
Thermal cameras with onboard A.I.



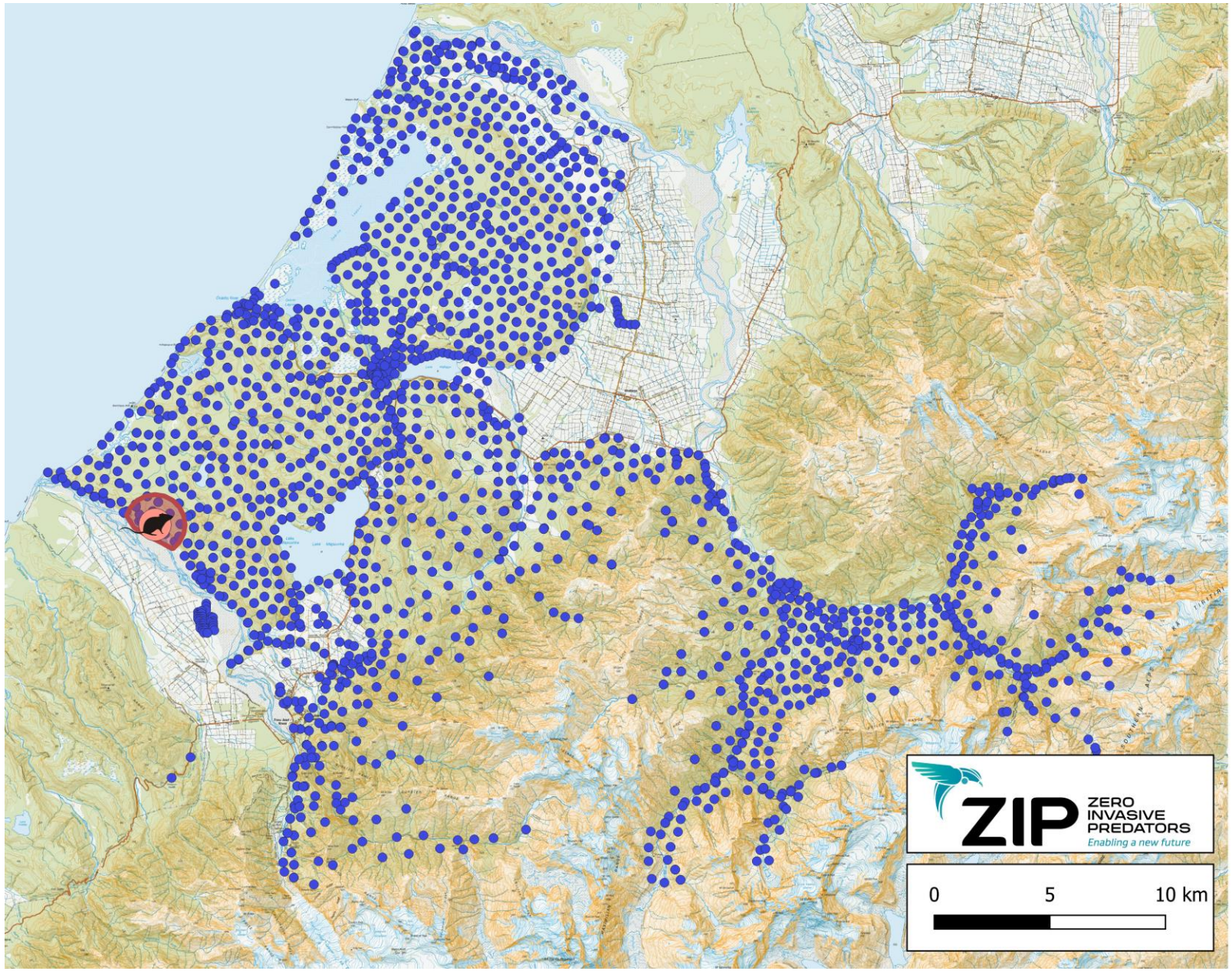
Trail cameras



Thermal cameras with onboard A.I.



Trail cameras



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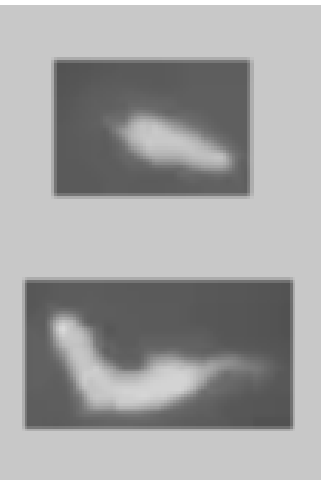
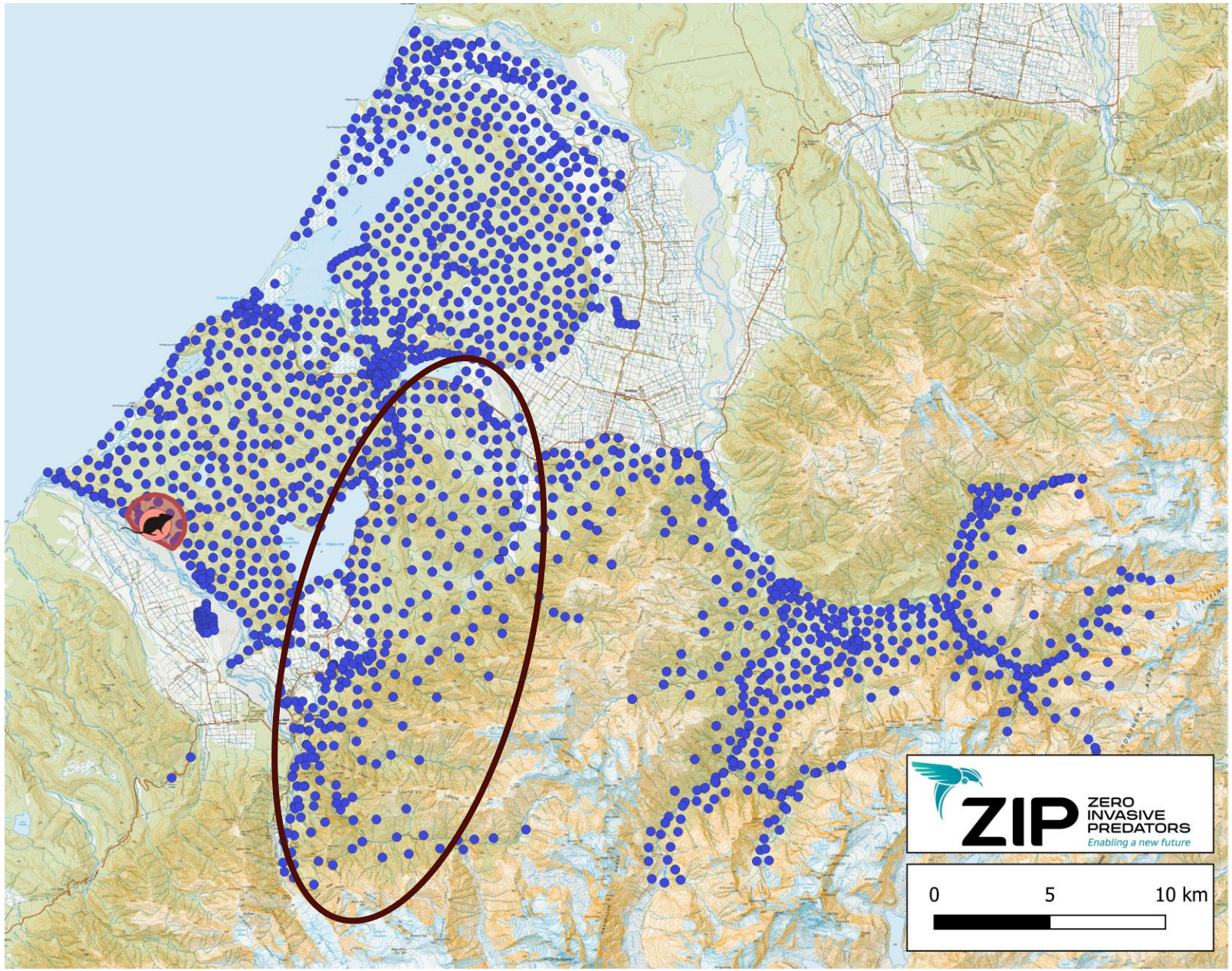
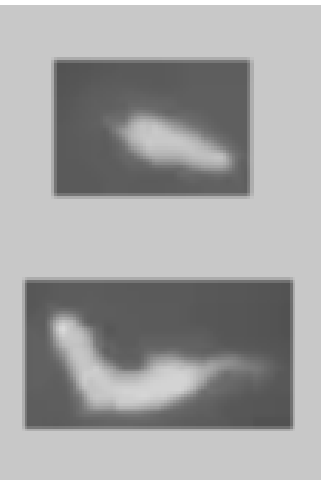


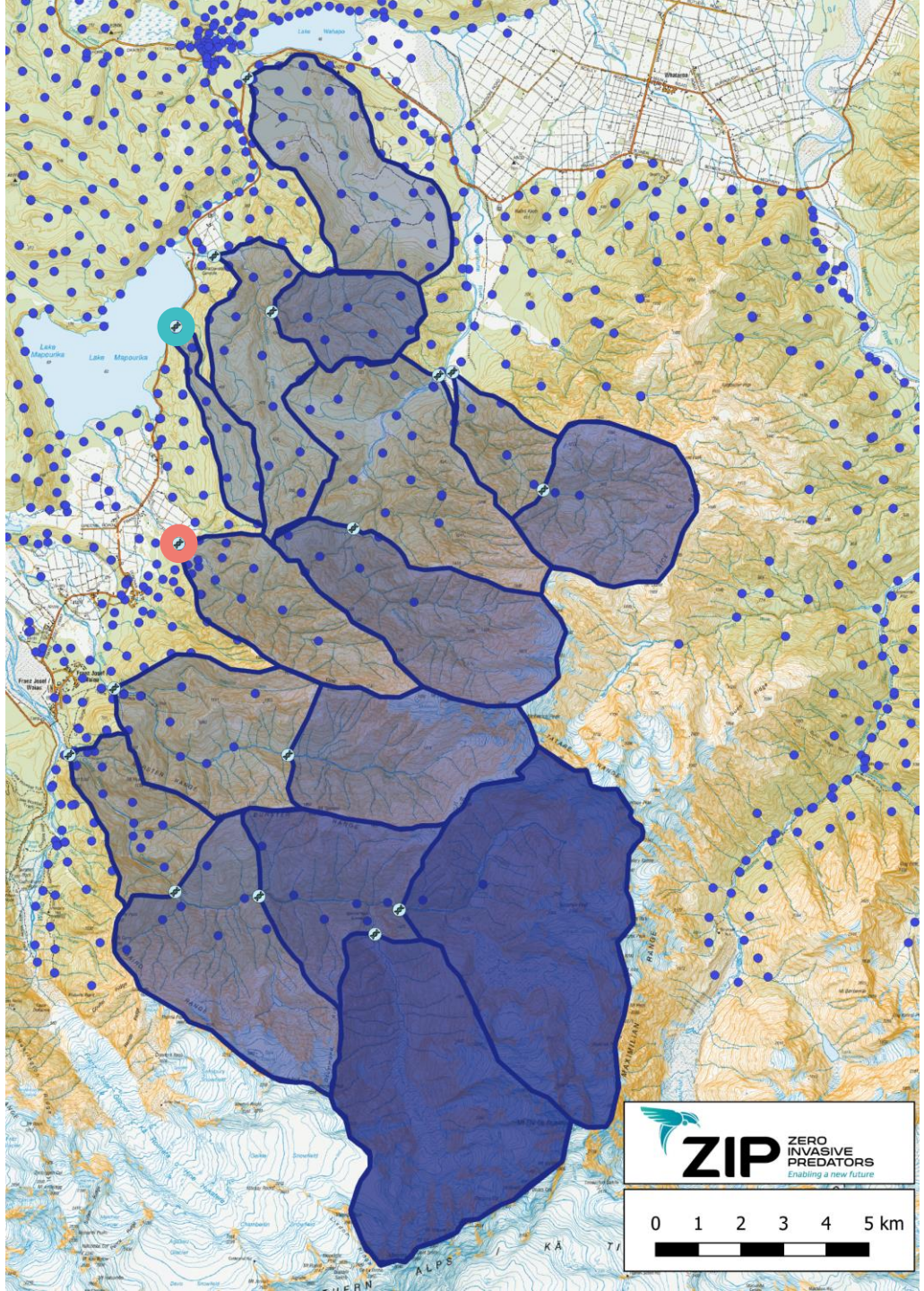
Trail cameras

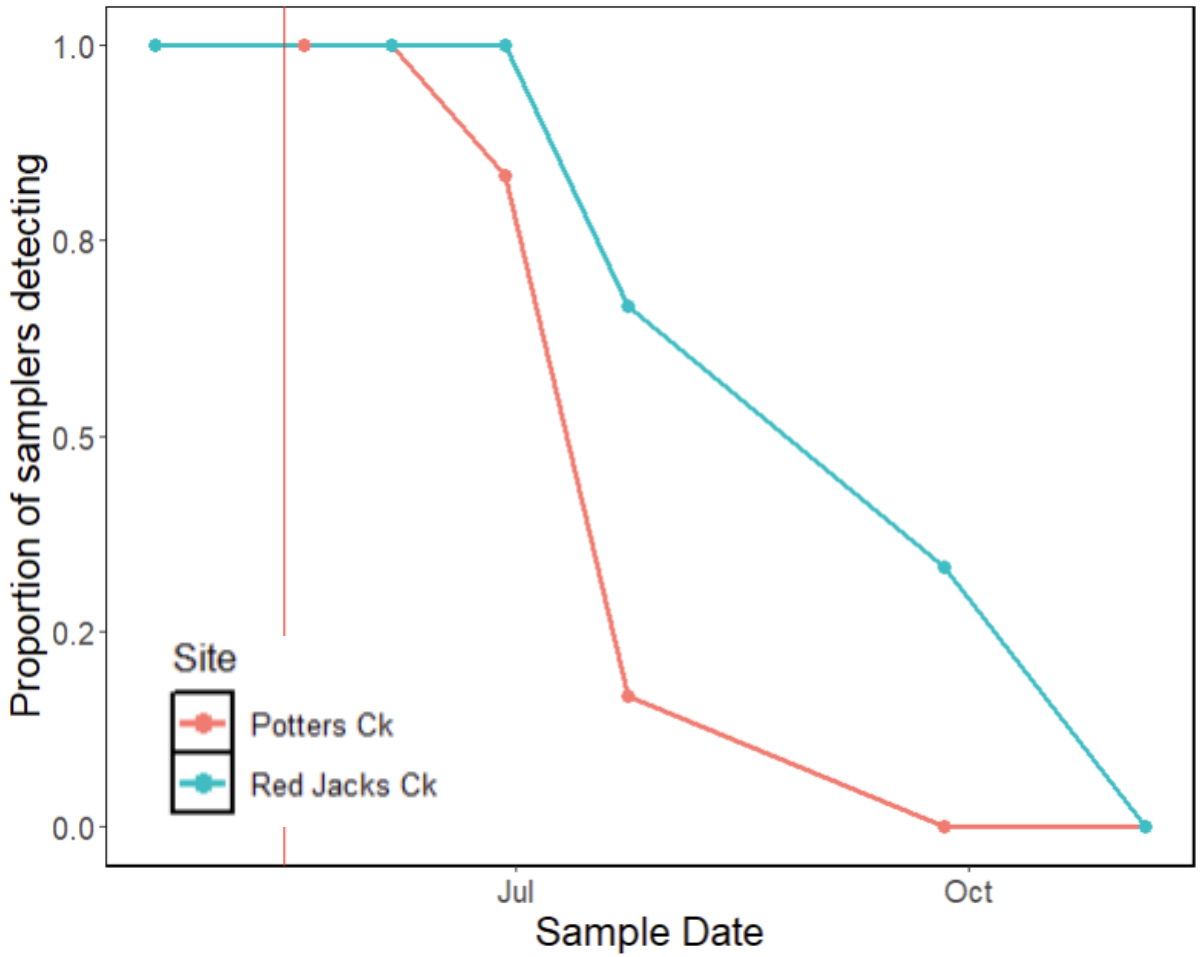


Thermal cameras with onboard A.I.

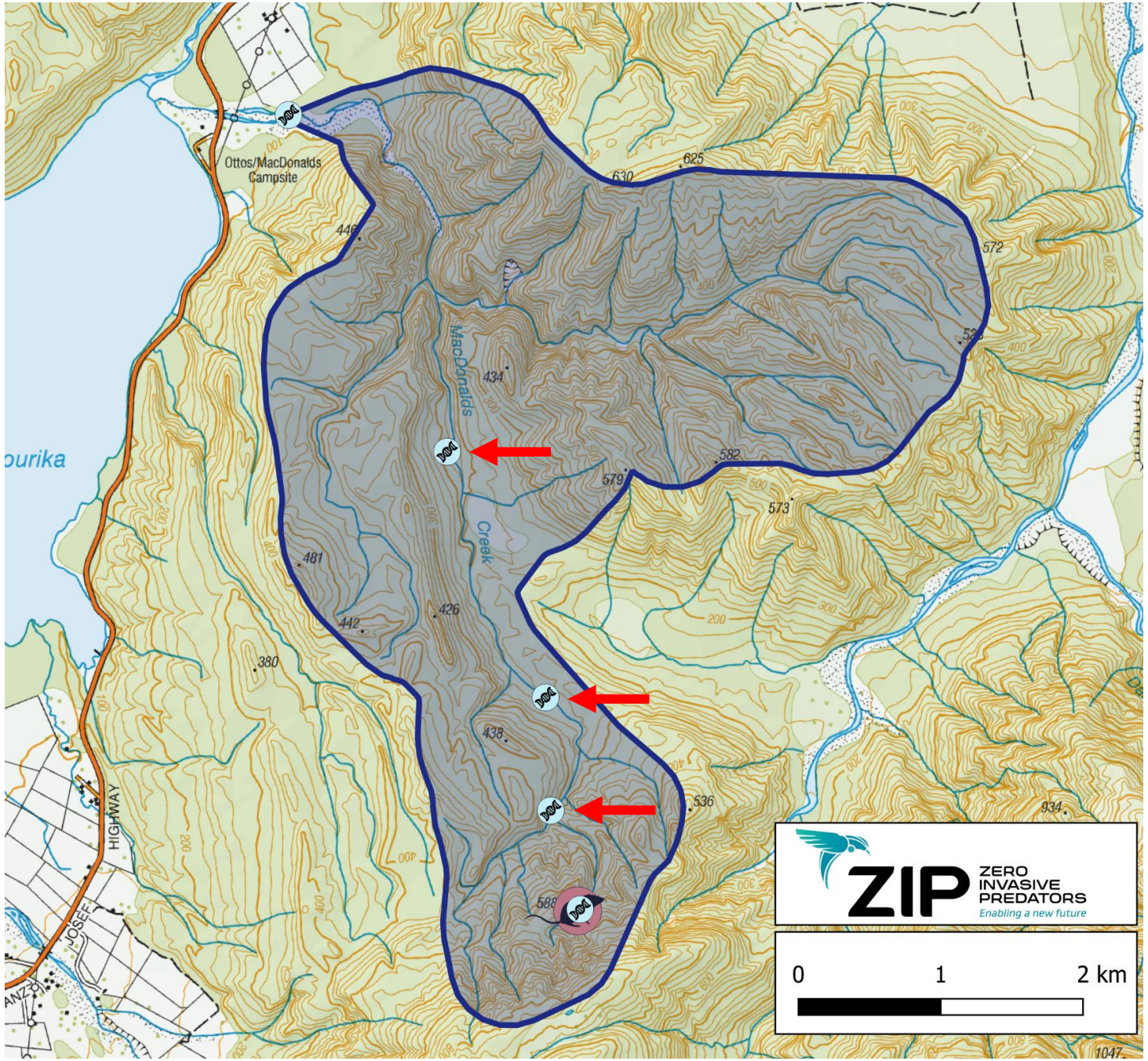


Trail cameras





- Rats detected in all catchments pre-op
- Rats not detected in any catchments one year post-op


Ottos/MacDonalds
Campsite
MacDonalds
Creek
HIGHWAY
ZIP
ZERO
INVASIVE
PREDATORS
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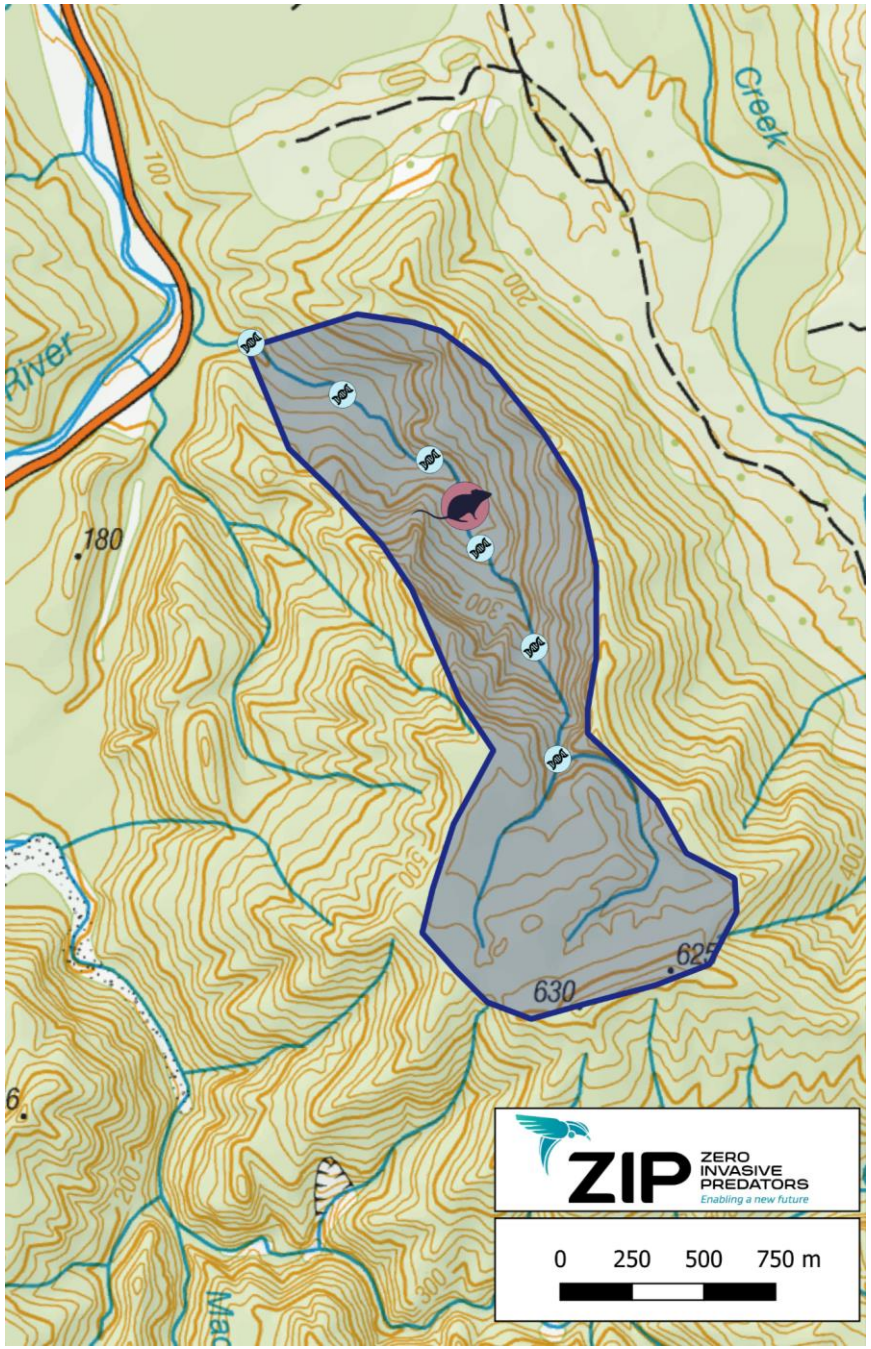
0
1
2 km


Creek
River
ZIP
ZERO
INVASIVE
PREDATORS
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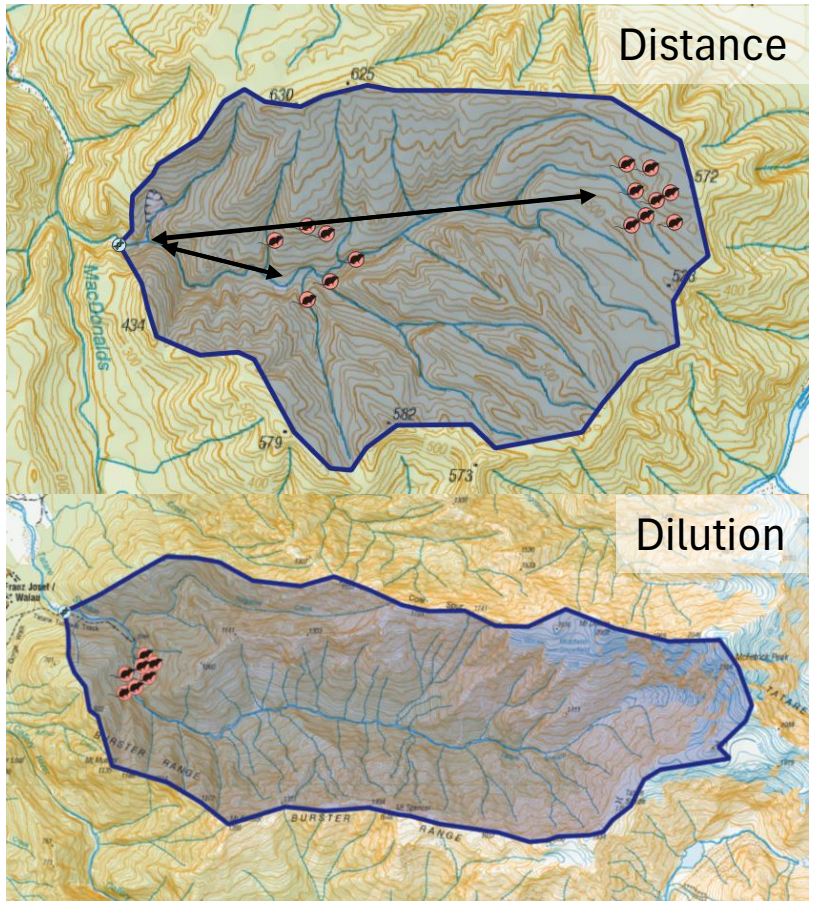
0
250
500
750 m

How can we increase eDNA surveillance sensitivity to detect small rat populations?

Where in the landscape is best to sample?



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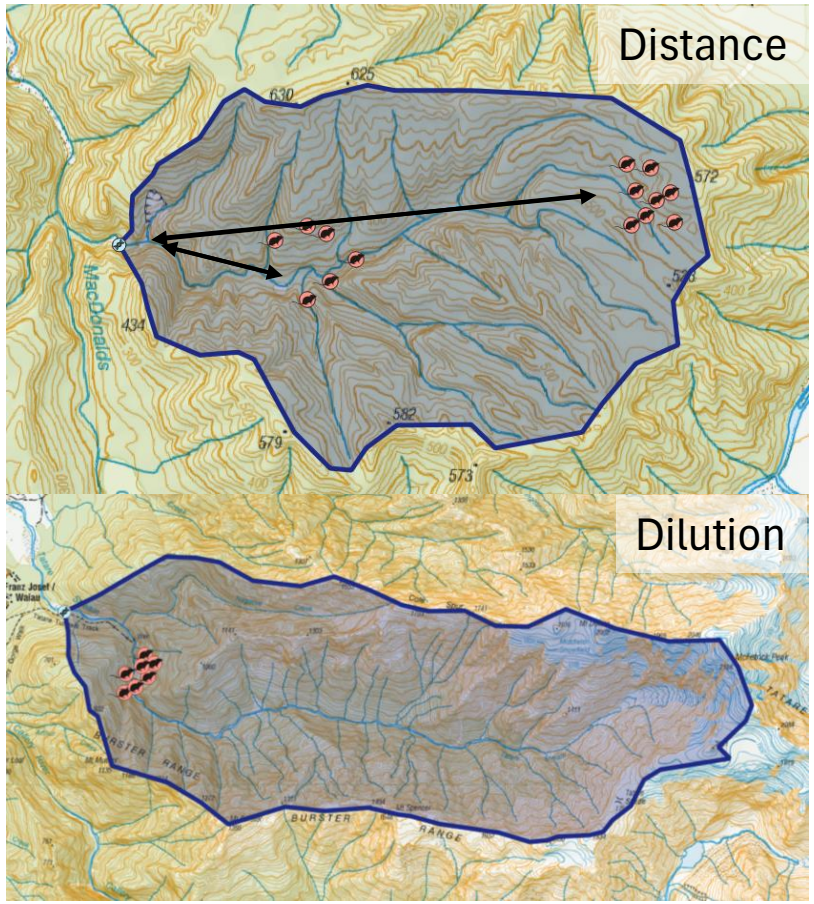
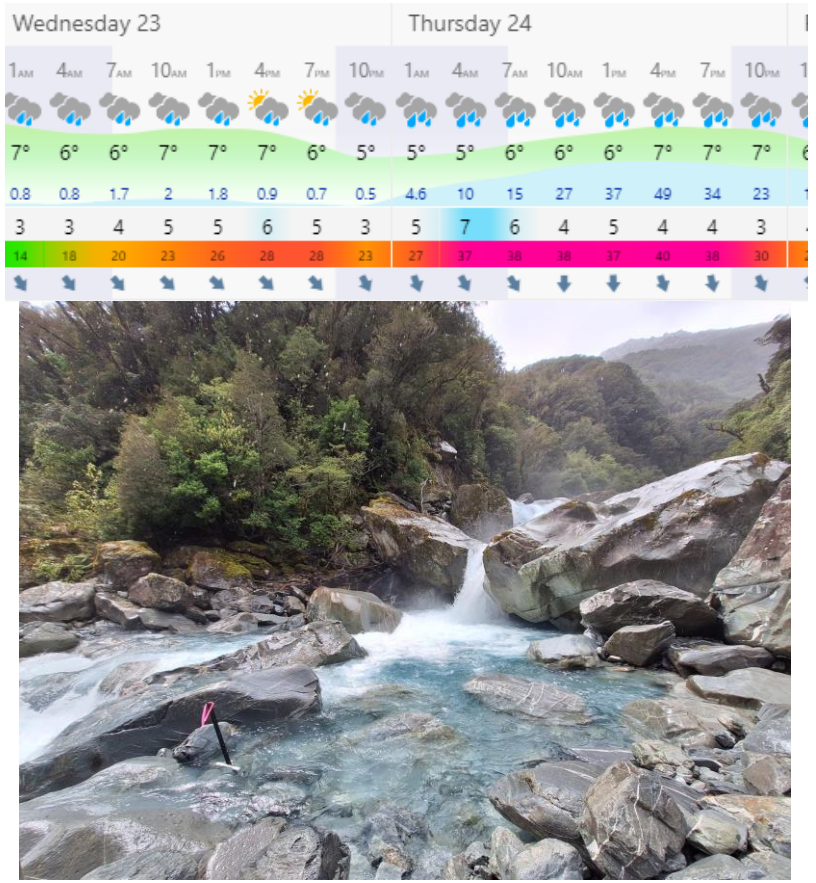


How do weather events influence sensitivity?



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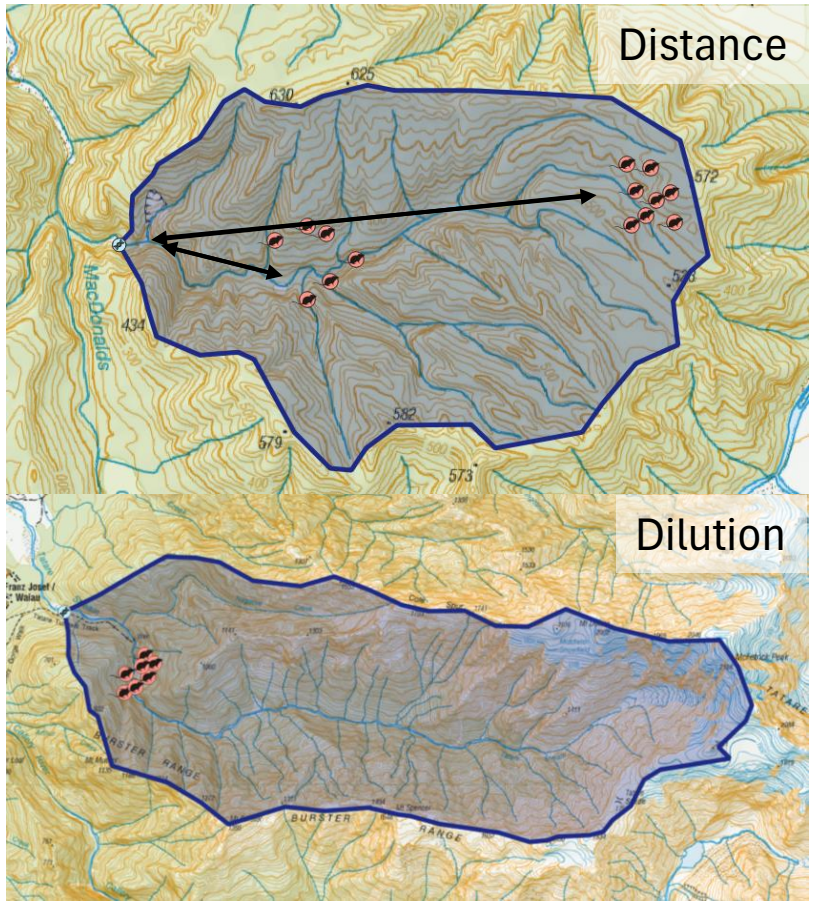

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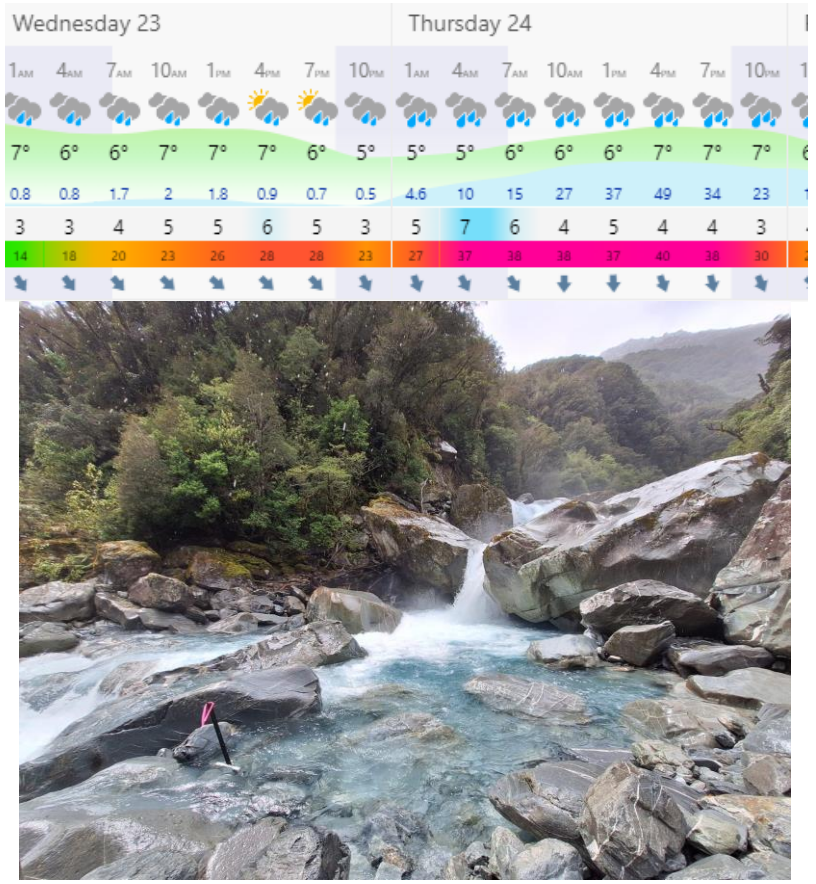
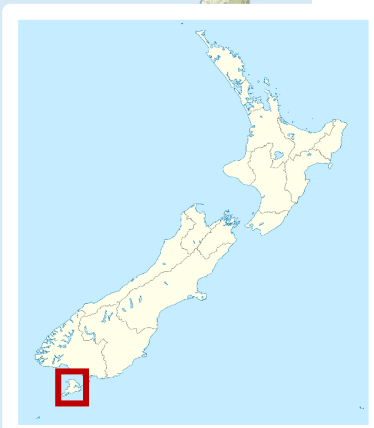
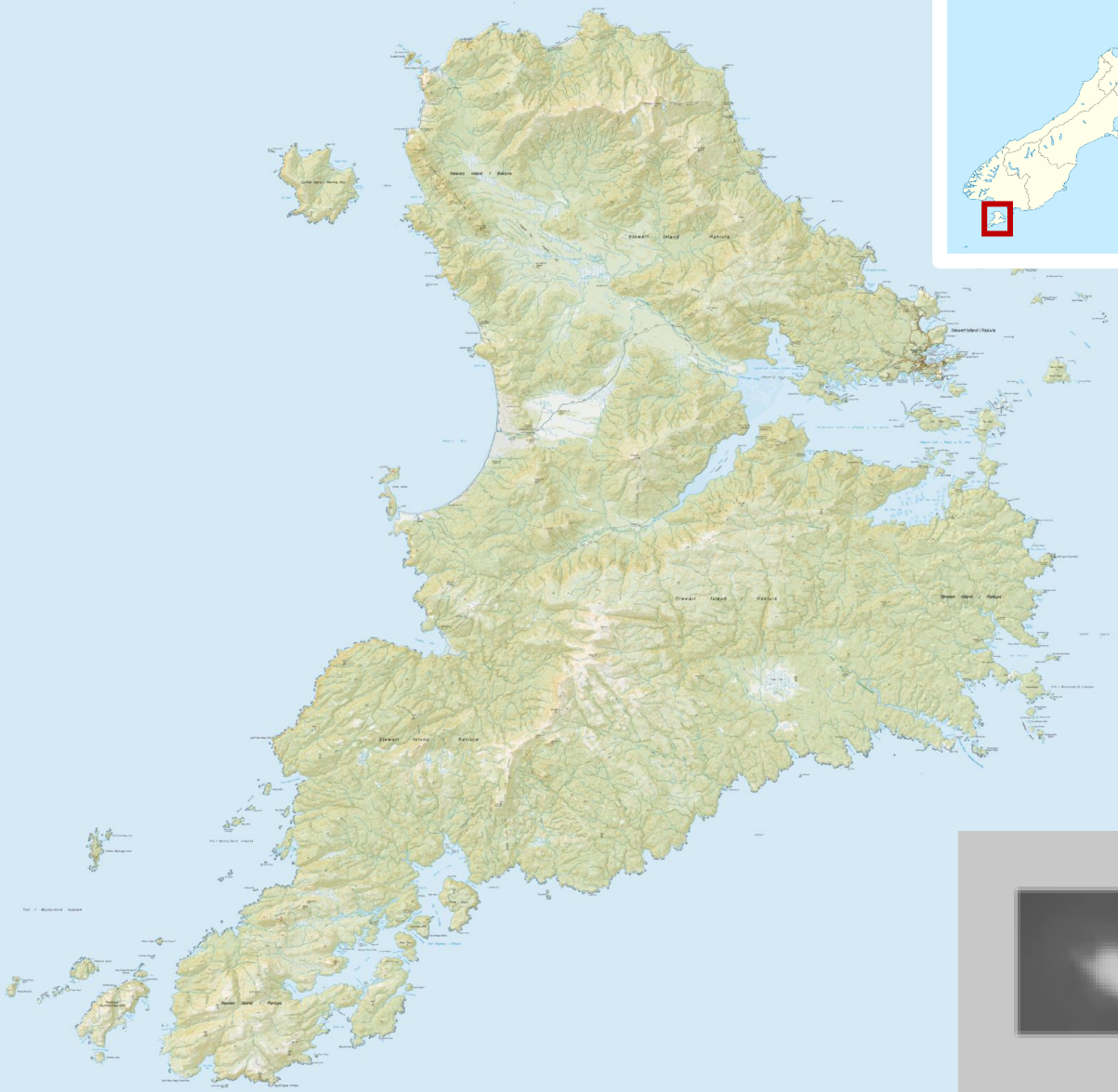


How can we refine the methodology?

Future application:





?

Img: That Nature Guy

Img: PF2050 Trust

Img: Rod Morris

We’d love to hear your ideas!

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ZIP team 2024

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