Wildlands

What's for dinner? Monitoring terrestrial invertebrate availability in braided river ecosystems

Photo credit: Craig Mackenzie

Presented to BRaid

Presented by Vikki Smith

Date: 8 July 2026

Three reasons to monitor invertebrates

Invertebrate communities:

1. Indicate river health and ecological values.
2. Indicate potential impacts on river health.
3. Support bird, fish and lizard populations.

(4. Invertebrates also have their own conservation issues)
(5. Invertebrates are quite interesting)

Mackenzie skink. Photo credit: Samantha King

Wildland Consultants (2025). *Standard protocols for terrestrial invertebrate ecology surveys as part of resource consenting applications. Wildland Consultants Contract Report No.* 7518. Prepared for Environment Canterbury. 63pp.

Wildland Consultants (2025). *Monitoring programme for terrestrial invertebrates on braided river plains in the Canterbury Region.* Wildland Consultants Contract Report No. 7459. Prepared for Environment Canterbury. 25pp.

A braided river bird buffet








Photo credit: Craig Mackenzie (birds)

Monitoring programmes need to be:

- Informed by scientific research
  (e.g. which groups are monitored by which methods?)
- Cost effective and practical
- Able to be implemented by community groups
  as well as researchers

Monitoring programmes need to NOT:

- Collect huge amounts of unhelpful data
- Rely on unmanageable, bulky equipment
- Be harmful to fragile river ecosystems

Photo credit: Craig Mackenzie

Why invertebrate identification bugs me

Is that a black-billed gull or a juvenile red-billed gull?

Megadromus vigil

Megadromus sandageri

Megadromus bucolicus

Megadromus curtulus

LBJs
(large black jobs)

Megadromus rectalis

Megadromus speciosus

Invertebrate monitoring challenges…

- Can get large quantities of diverse samples.
- Many undescribed species.
- No standard sampling protocol.
- Many vulnerable/sensitive species on river beds, many of which have not had their threat statuses assessed.

…And how we overcome them

- Subsampling
- Indicator taxa
- Morphospecies
- Notable invertebrates
- Live-capture and photography

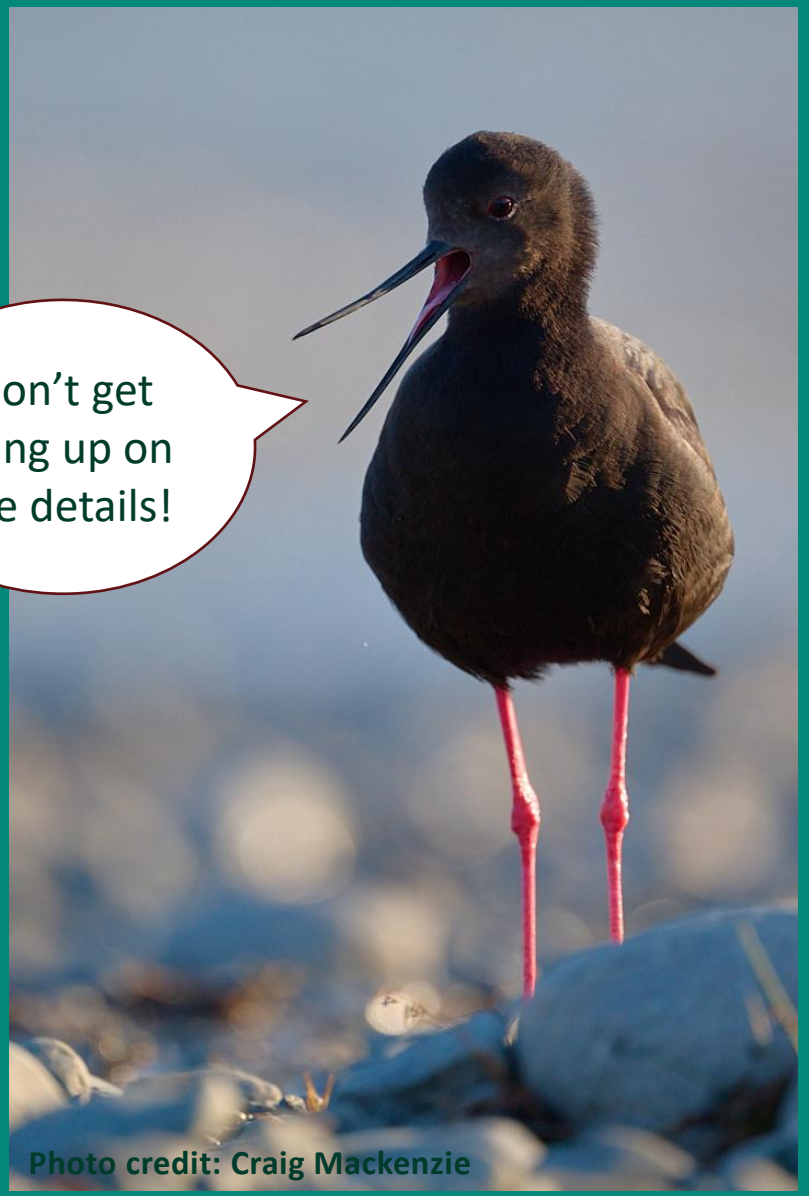


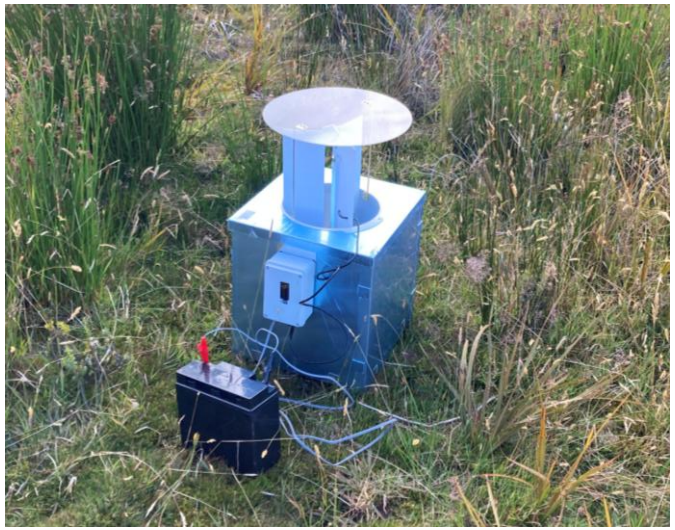
Photo credit: Craig Mackenzie

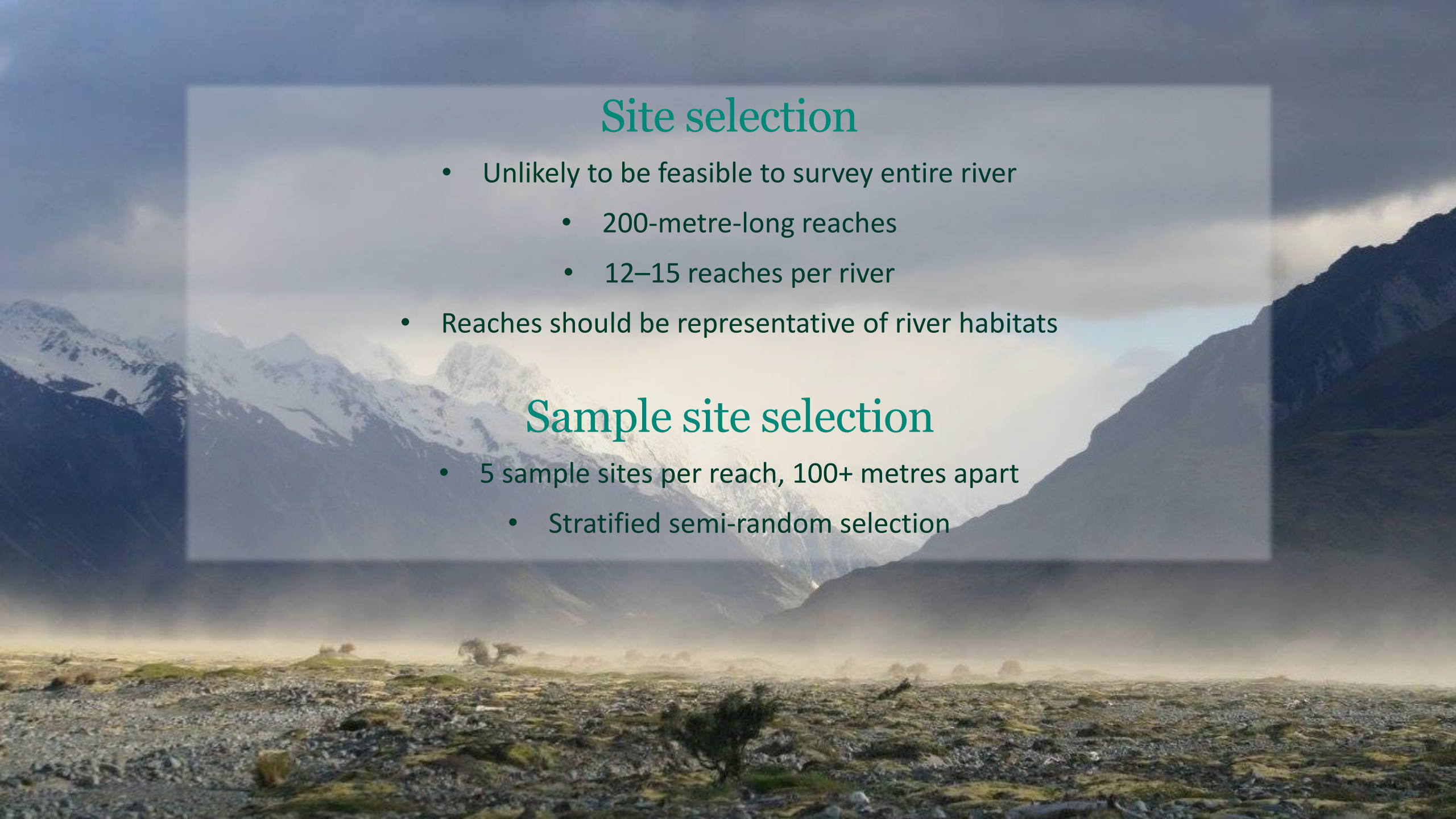
Invertebrate monitoring methods

- Malaise traps
- Pitfall traps
- Light traps
- Transects


Photo credit: Lincoln University


Artwork by Magnus Muhr





Site selection

- Unlikely to be feasible to survey entire river
  - 200-metre-long reaches
  - 12–15 reaches per river
- Reaches should be representative of river habitats

Sample site selection

- 5 sample sites per reach, 100+ metres apart
  - Stratified semi-random selection

At each sample site:

5 x pitfall traps (6 metres apart)

1 x 100-metre transect

1 x Malaise trap

1 x light trap

100 metres x 10 metres

1

2

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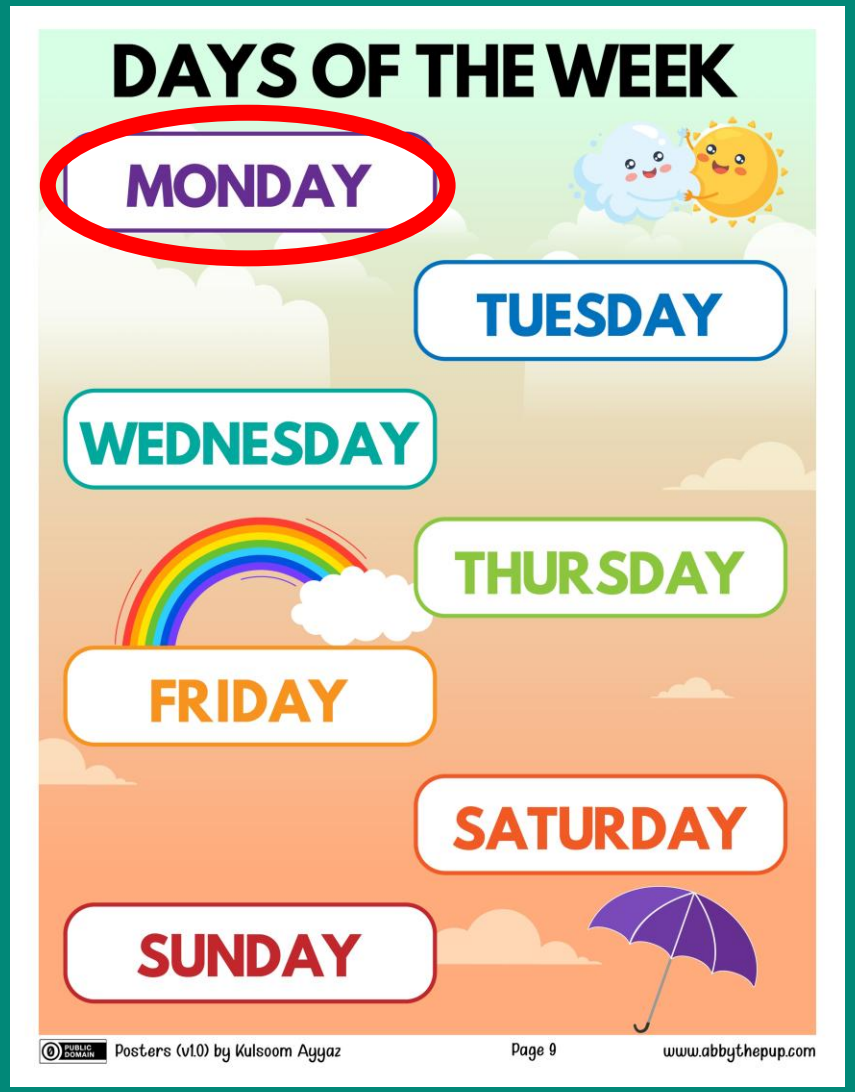
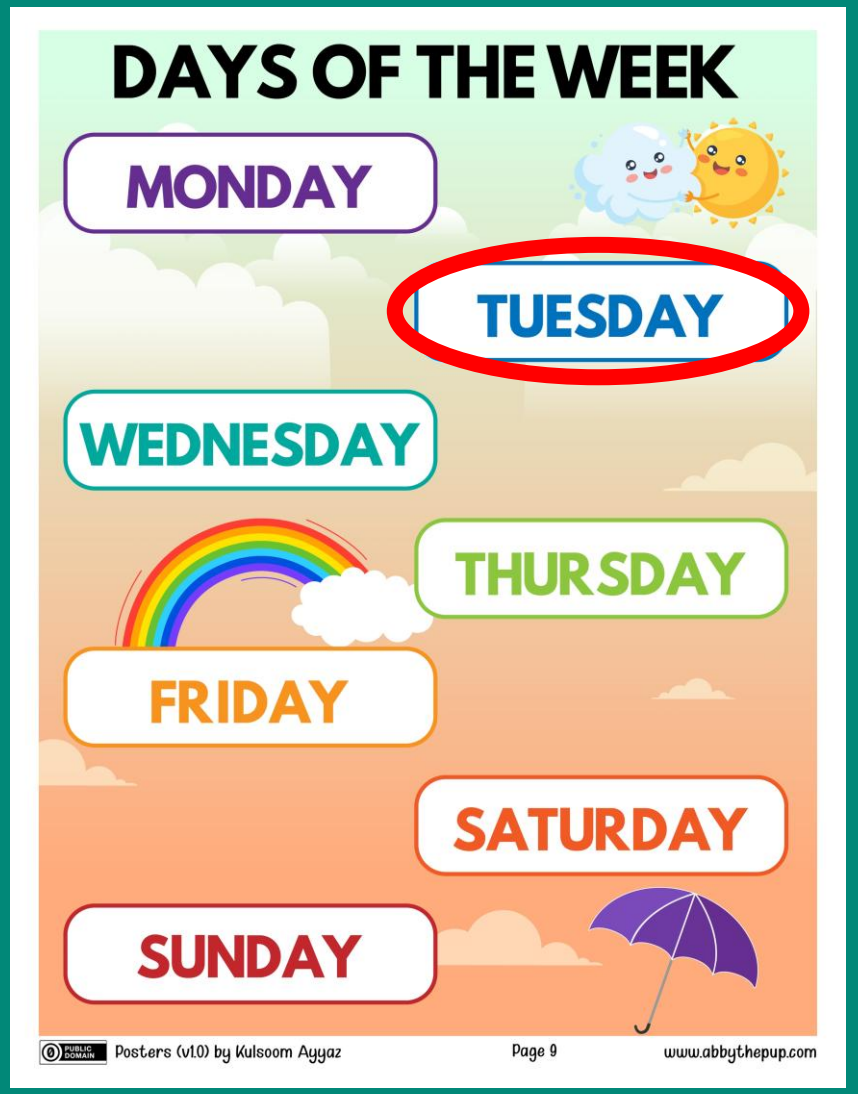
Survey day one

- Try and arrange good weather (warm, sunny, high humidity*)
- Set up and run walkthrough transects once
- Set pitfall and Malaise traps
- Set up and run light traps overnight



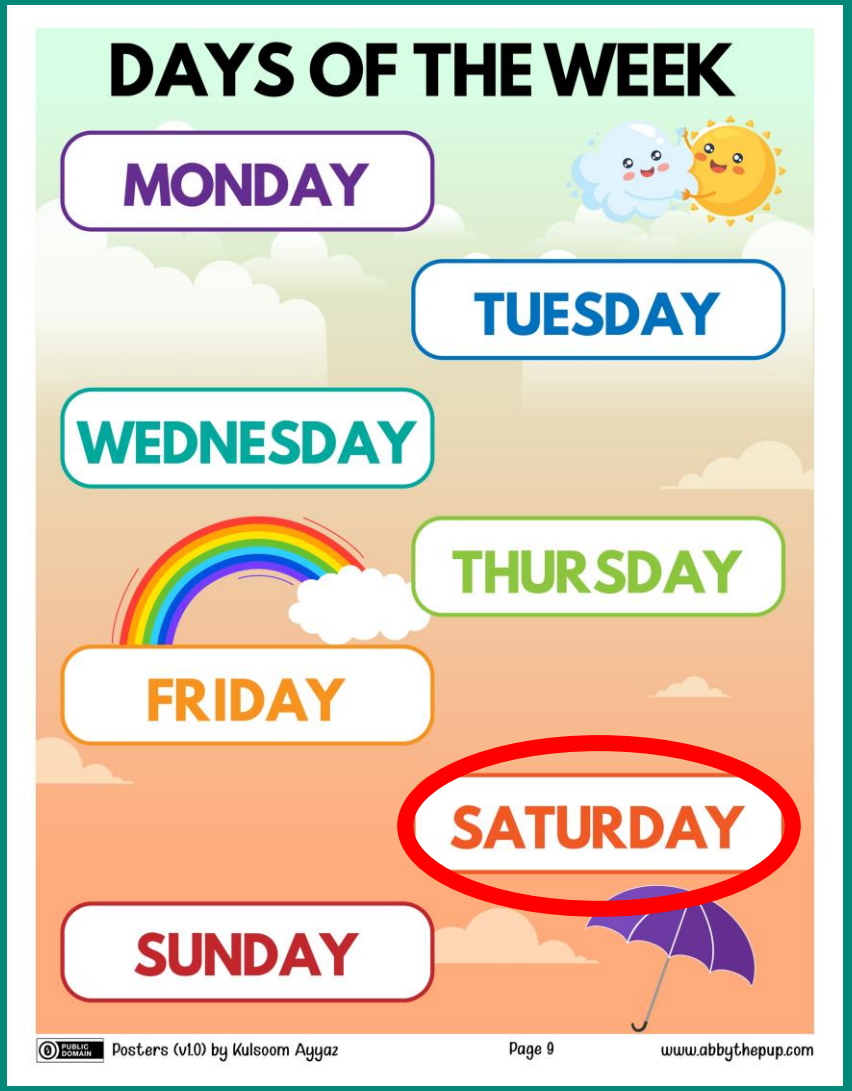
Survey day two

- Run walkthrough transects once
- Collect light traps



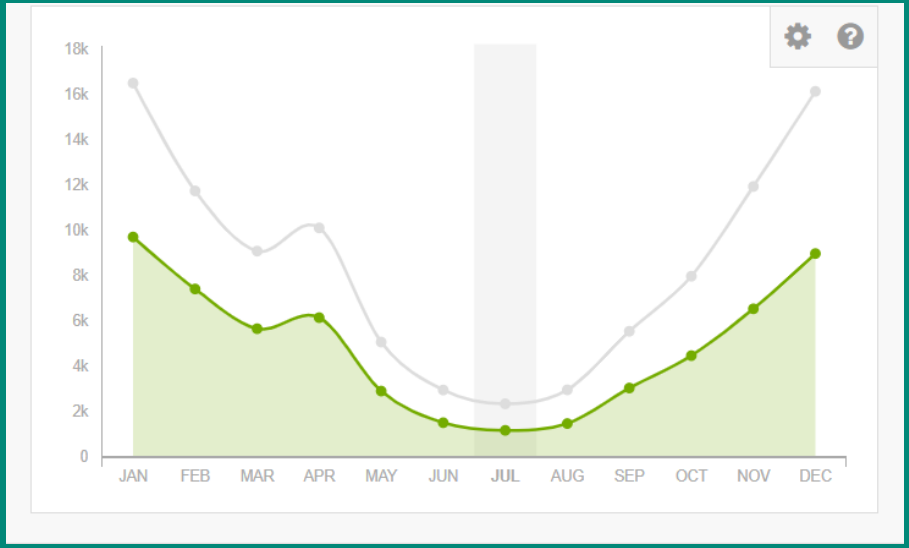
Survey day three

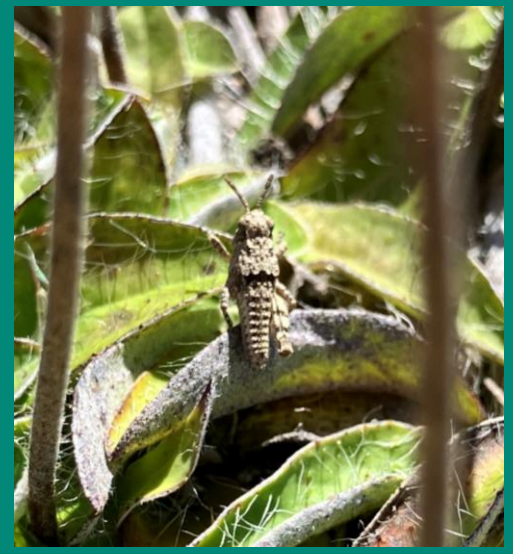
- Run walkthrough transects once
- Collect pitfall traps
- Collect Malaise traps



Seasonal monitoring considerations

- Invertebrates are active in different months depending on species
- December is a good time to start (less risk of freshets and flooding)
- Ideally monitor every 6 weeks until end of February
- Even if not interested in species diversity, useful to understand shifts in availability of food from different invertebrate orders
- If interested in particular taxa (e.g. beetles) check iNaturalist.org to see periods of activity*





Processing all the data

- Subsample: Bogorov counting chamber (or get creative)
- Order level ID may be sufficient
- Abundance, diversity, notable species
- Compare abundance of different food groups over time (e.g. a lot of what you catch in pitfall traps will be available to dotterels and wrybills)

Photo credit: Craig Mackenzie

Economising

- Malaise trap – reduce time out
- Strategic seasonal sampling
- Pick indicator taxa
- Pick specific habitat types
- Switch to kill pitfall traps?

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3

Acknowledgments

Phil Grove and Helen Greenep

Rob Cruickshank, Peter Johns, and others from the Entomological Society of New Zealand

Wildlands team – DJ King, Olly Ball, Justyna Giejsztowt, Des Smith

Photo credit: Dr Della Bennet

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Thank you

Dr Vikki Smith – Senior Invertebrate Ecologist

Email: Vikki.Smith@wildlands.co.nz

Phone: 021 224 1419

Photo credit: Dr Della Bennet