Department of Conservation
Te Papa Atawhai

Invertebrate biodiversity of the Ashley-Rakahuri & Cass Rivers: *Impacts of weeds & flooding*

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Braided Rivers Seminar, 6 July 2022, Lincoln University

Photo: Sue Anderson (DOC Project River Recovery)

Measuring & interpreting biodiversity values

- Tasman method development study
  - When, where, how, what
  - Recommended protocol

- Cass / Ashley / Aparima
  - Primarily joint DOC-ECan project
  - Test recommended method
  - Baseline biodiversity values
  - Influence of weeds
  - Impacts of weed management

  - Impacts of flooding

Lower Cass (Mackenzie Basin)

- Relatively weed free
- 3 sites

Photo: Tara Murray

Ashley - Rakahuri

- 6 sites:
- 3 unmanaged, 3 raked

Photo: Nick Ledgard

Aparima (Southland)

- 6 sites:
- 3 future gravel extraction
- 3 unmanaged

Methods

- 5 pitfalls per line
- 1 Malaise per line
- 5 days sampling
  - Nov, Dec, Jan, Feb

Photo: Bob Gumbrell, ARCG

Photo: Judith Hughey, ARCG

Photo: Judith Hughey, ARCG

Photo: Tara Murray

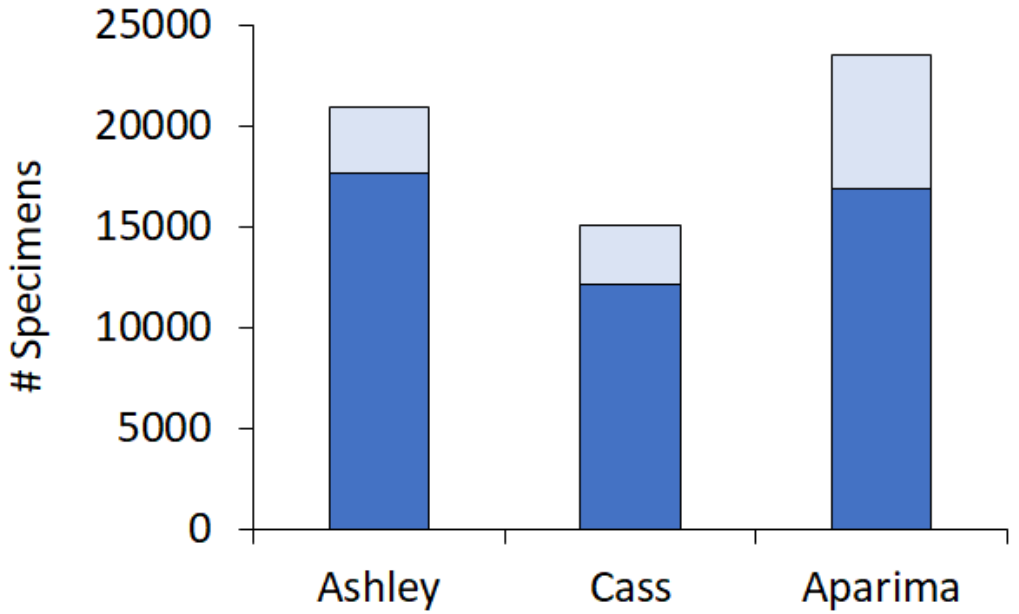
Methods

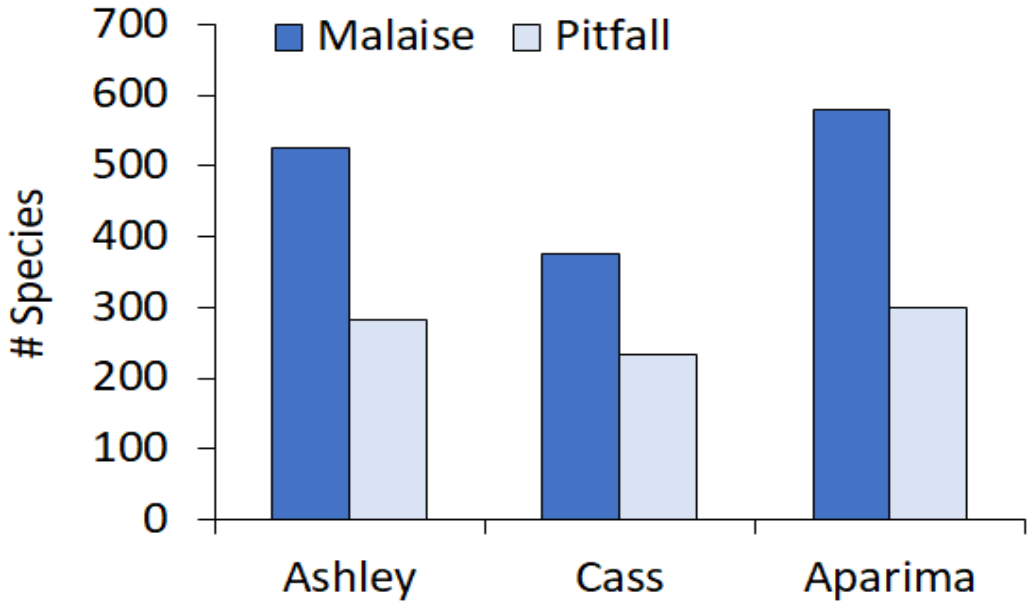
- Specimens >2mm to RTU
  - Recognisable taxonomic units
  - RTU043 = *Actenonyx bembidioides*
  - RTU099 = *Scopodes species 1*
  - RTU837 = Carabidae

Results

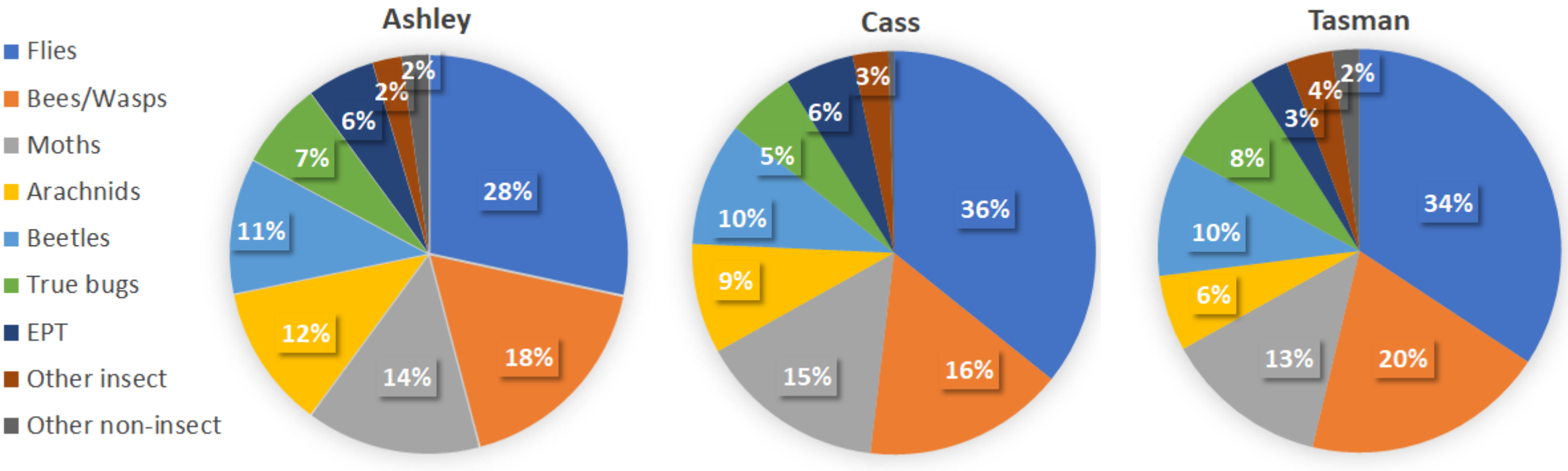
- 59,509 specimens >2mm
- 1,069 different RTUs
- 26 invertebrate orders
  - 12 insect orders
  - 10 other arthropod orders
  - Slugs, snails, worms (Aparima)

- Cass = lower sampling effort





Diversity


Flies
Bees/Wasps
Moths
Arachnids
Beetles
True bugs
EPT
Other insect
Other non-insect
Ashley
28%
18%
14%
12%
11%
7%
6%
2%
2%
Cass
36%
16%
15%
9%
10%
5%
6%
3%
Tasman
34%
20%
13%
6%
10%
8%
3%
4%
2%











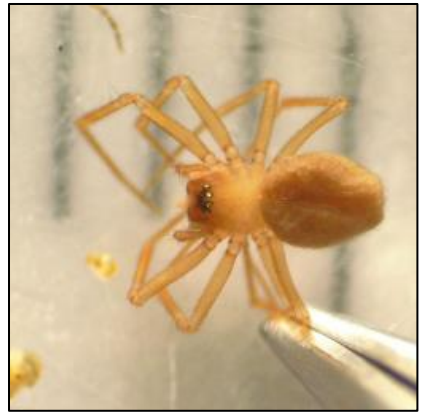


















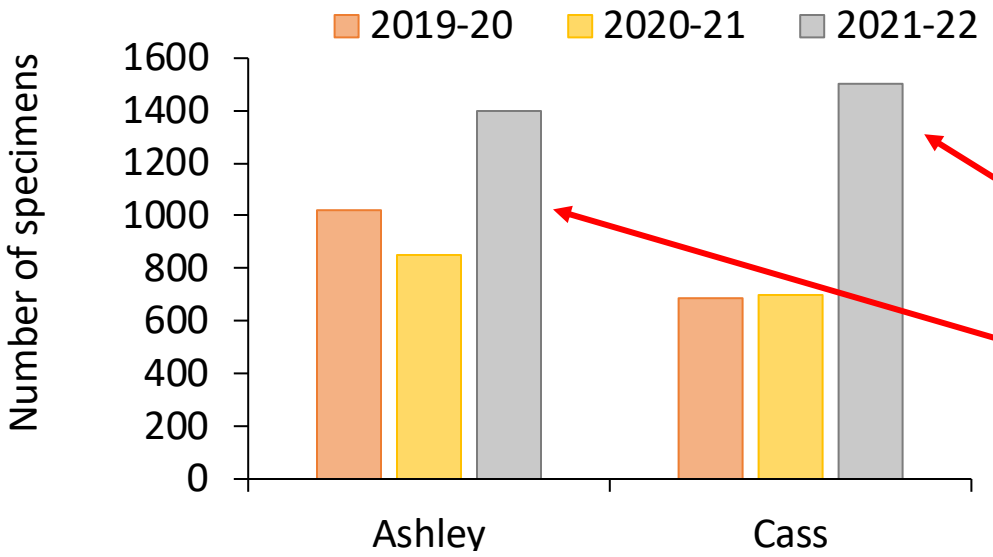


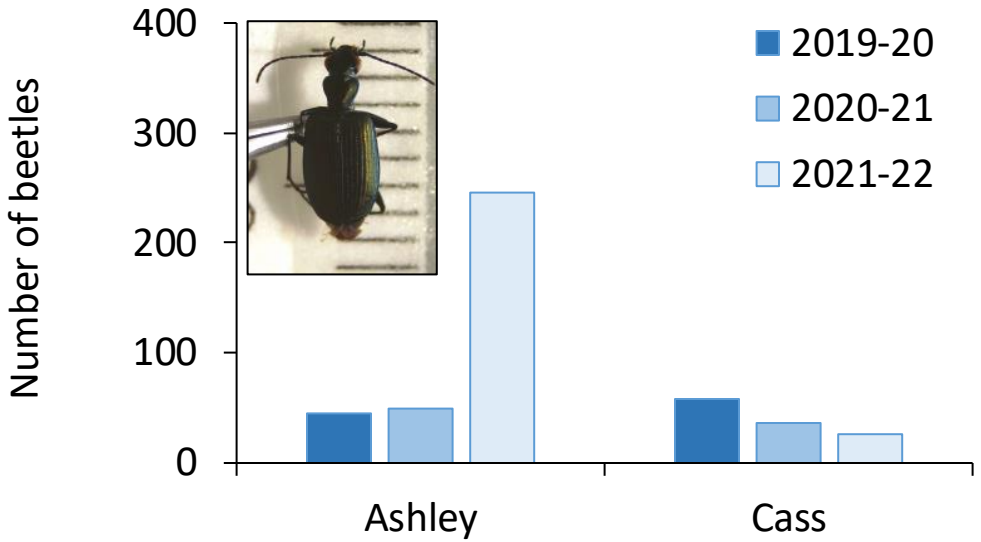







Pitfall trap total diversity & abundance



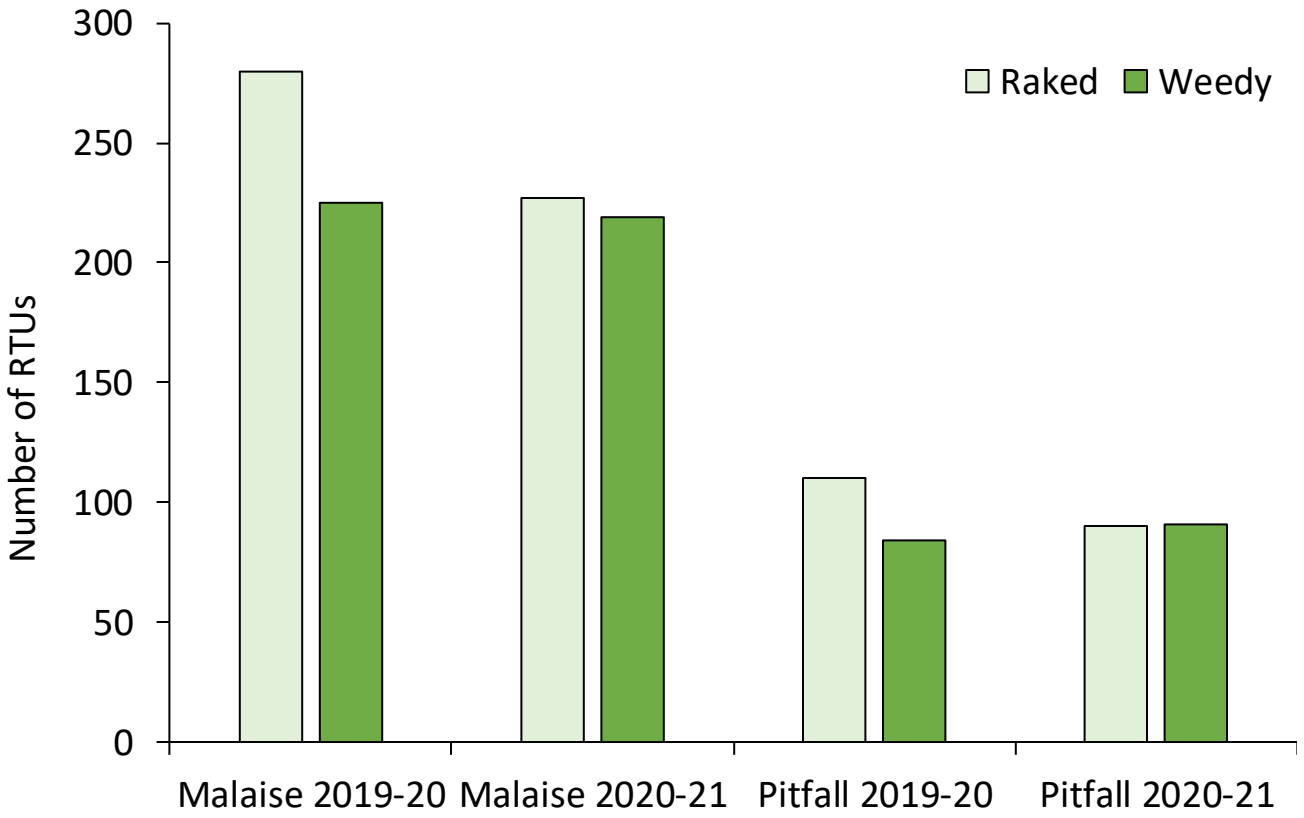


- Which species?
- What are they responding to?

- Cass - Ants, caddisfly
- Ashley - Chironomid fly, small carabid beetle

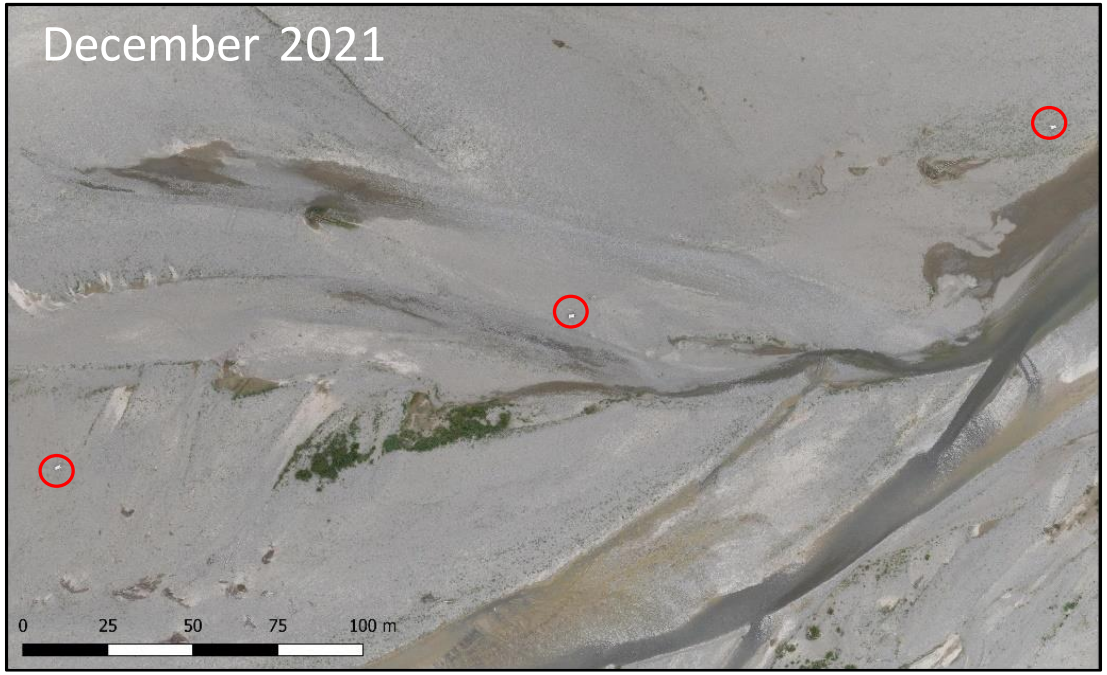
Drivers

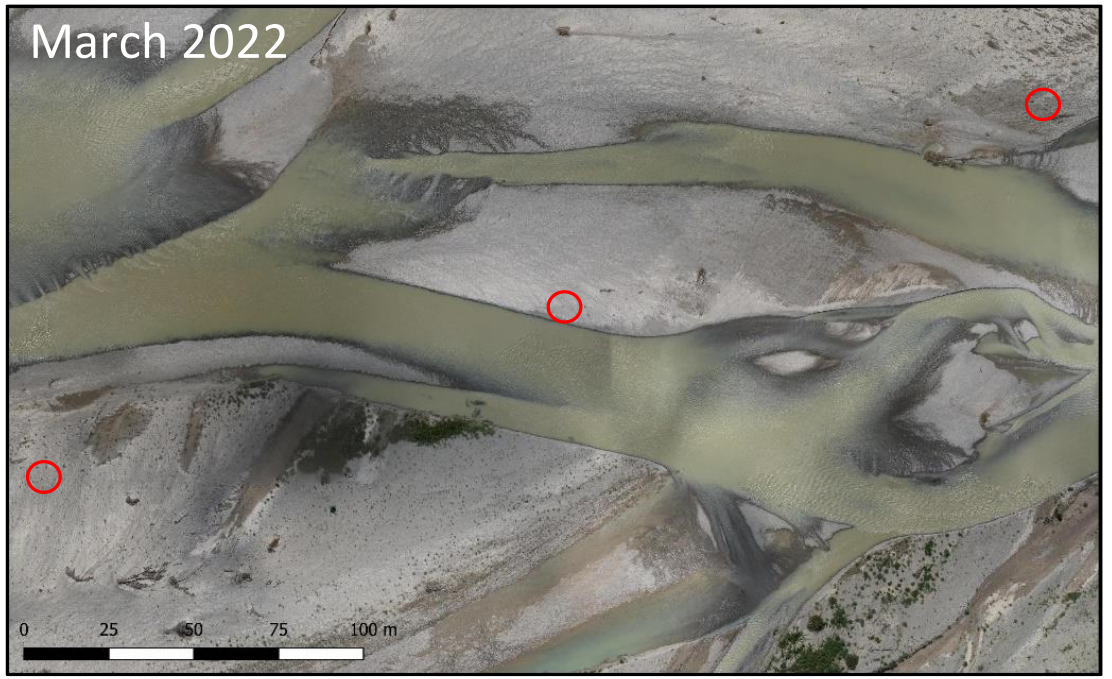
- Responses to weeds and weed removal
  - Differences between years
  - Differences between rivers & sites
- Diversity slightly higher in raked site
  - Difference less in year 2
  - Weeds growing back?
  - Communities converging?
  - Too early to tell?
- Interaction with floods
- Weed ‘re-set’



Total number of species (diversity) detected in malaise and pitfall traps in two consecutive sampling years on the Ashley River.

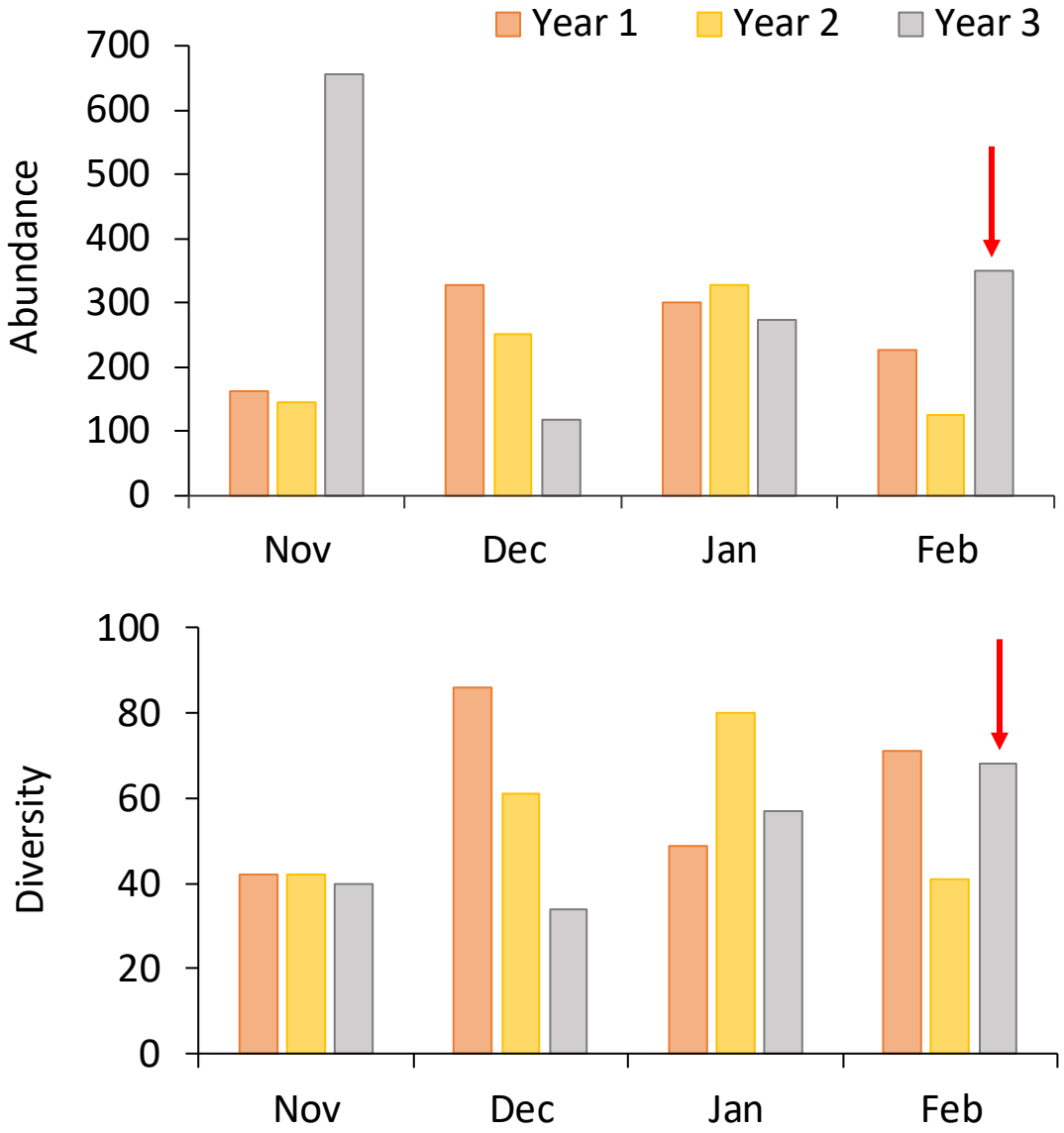
Marchmont ‘raked’ sample sites: *Photos Grant Davey, ARCG*





- Ashley - February 2022 flood
  - No indication of insect decline

Photos: Grant Davey, ARCG



Total abundance and diversity of species detected in pitfall traps in three consecutive sampling years on the Ashley River.

Next steps

- Incredibly rich dataset – time to process
- Highlights the dynamic nature of braided rivers
- Importance of long term monitoring

- Community composition
- Functional variation
- Correlations - weeds and flood events

Enormous thanks to the Ashley-Rakahuri Rivercare Group, Jolene O'Connor, Jennifer Schori and Sam Turner for field work and to Jessica Chen for insect identification & photos