



Landcare Research
Manaaki Whenua



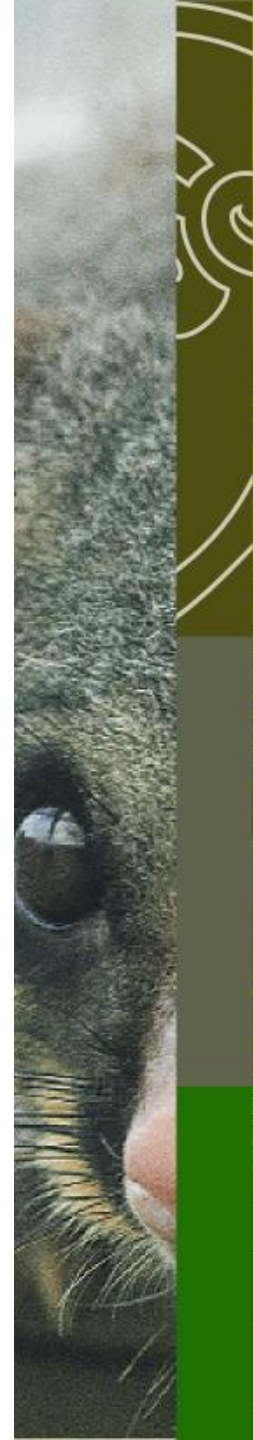
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Mouse impacts on biodiversity at Maungatautari

John Innes, Corinne Watts, Neil Fitzgerald, Scott
Bartlam, Danny Thornburrow, Mark Smale (Hamilton)

Deb Wilson (Dunedin)

Maj Padamsee, Peter Johnston (Auckland)

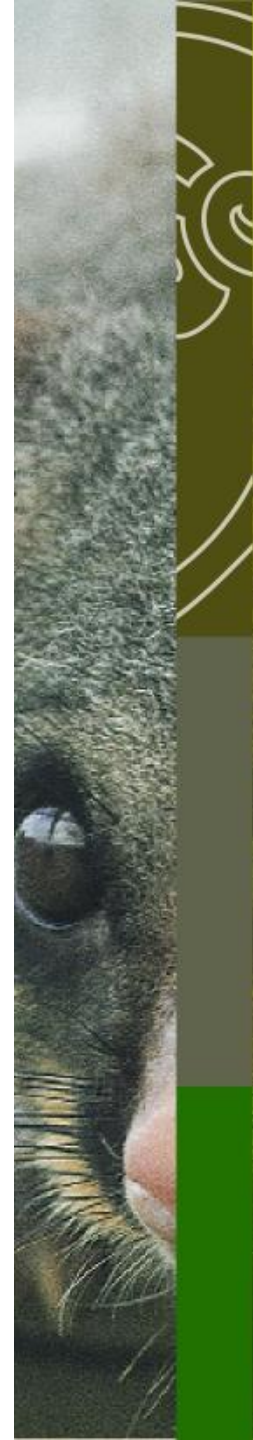




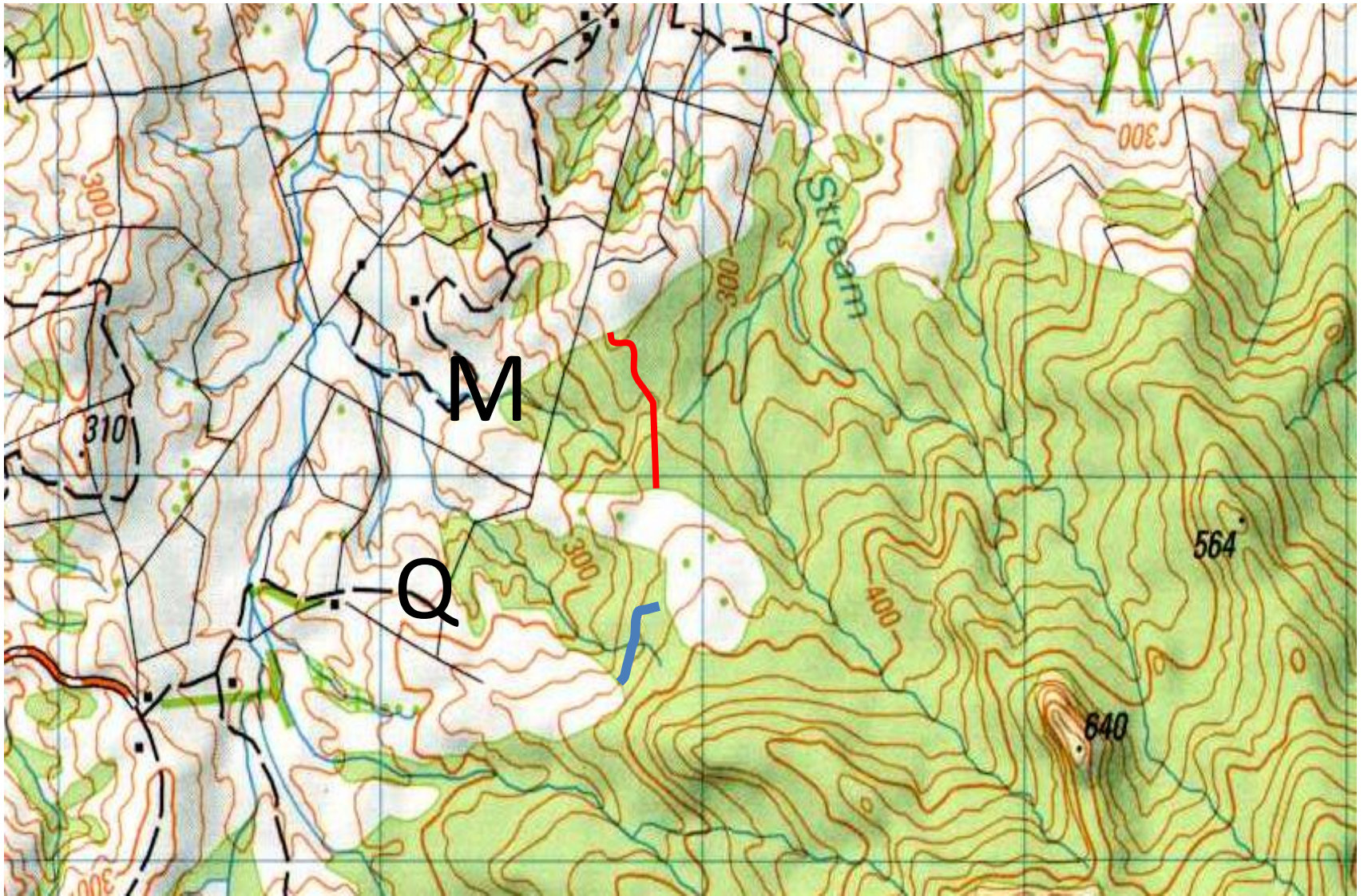
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Abundant mice may:

- Burrow out under the fence and let stoats, ship rats, weasels in
- Interfere with tracking tunnels set for ship rats, stoats, hedgehogs, possums
- Damage biodiversity (seeds, inverts, verts) by eating
- Be seen by visitors, day or night, damaging the 'sanctuary experience'

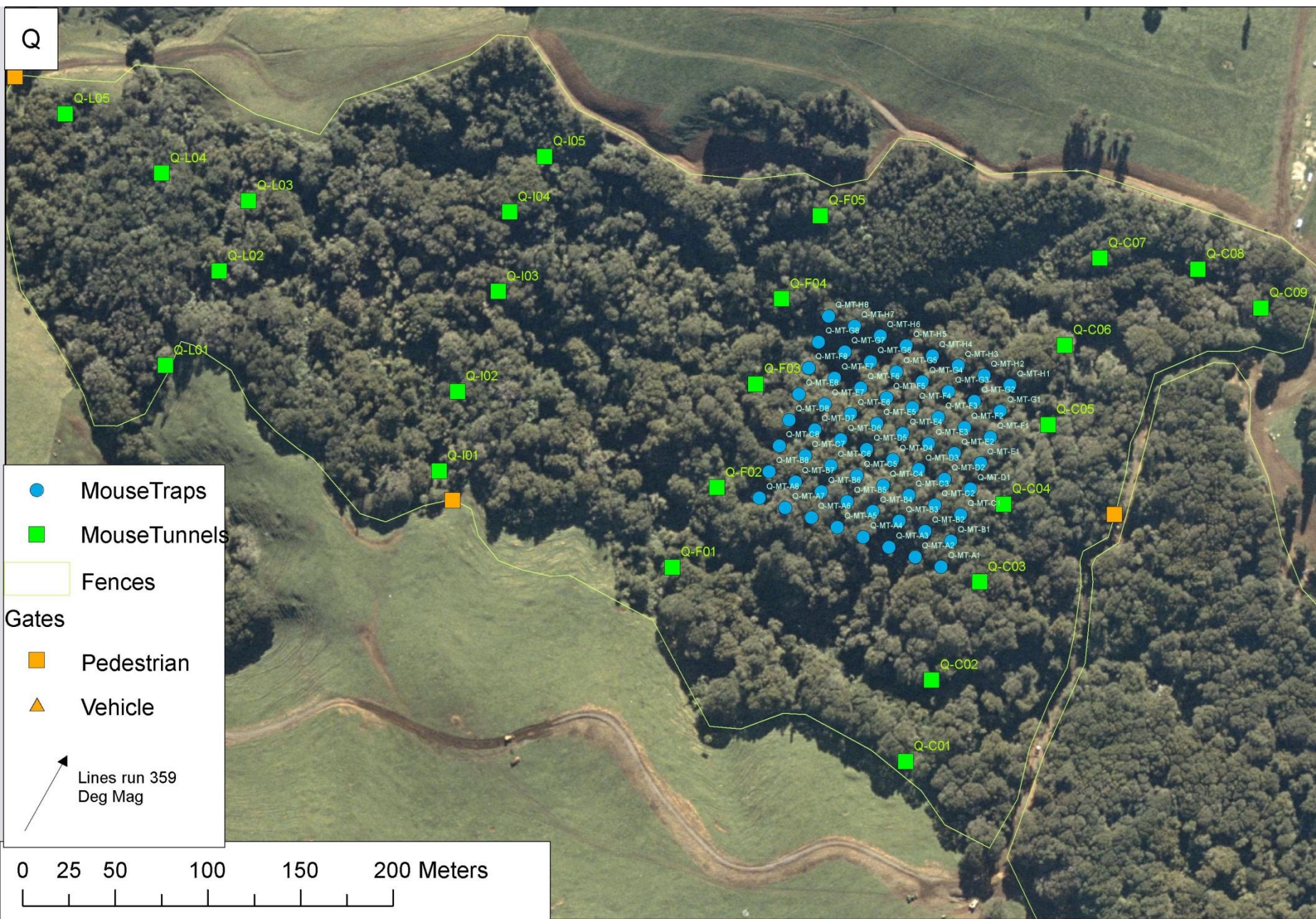


Maungatautari study areas



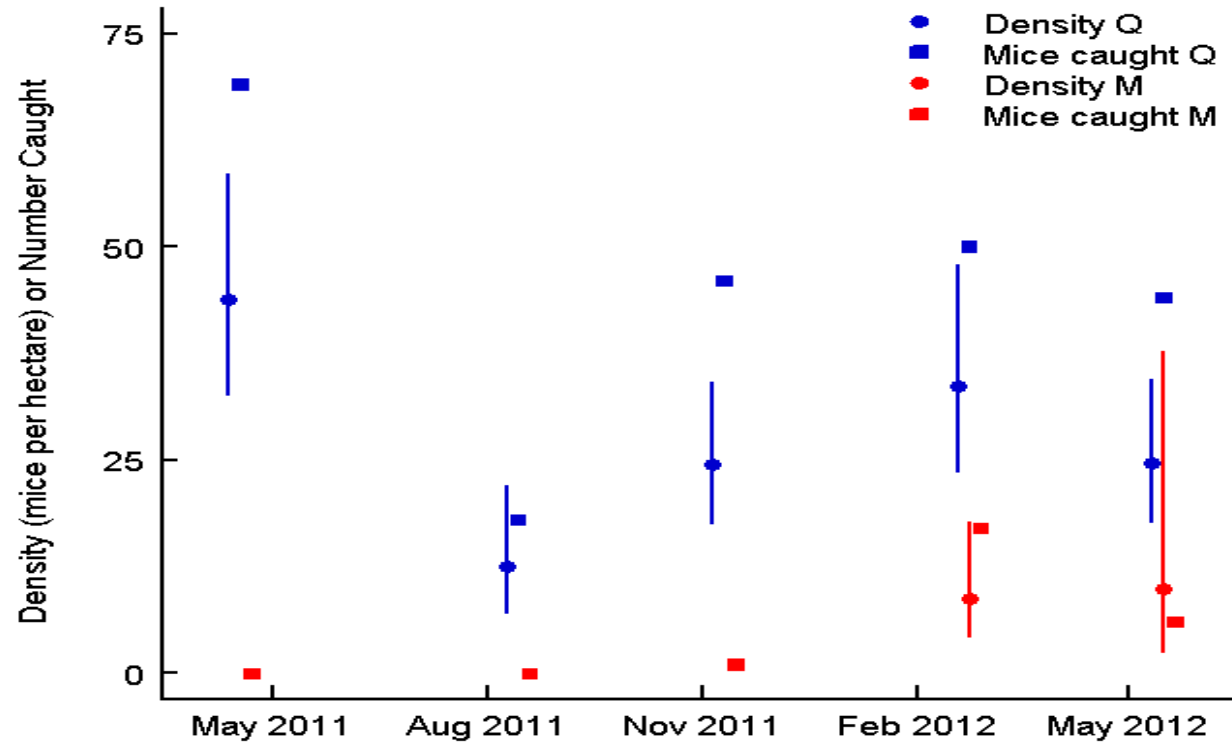
Study blocks

- Q Pest-fenced 2006 – all mammals except mice eradicated late 2006. Mice eradicated? 2008, but abundant since May 2009
- M Main mountain – most mammals eradicated late 2006. Mice low until late 2011; reinvaded slowly, now uncontrolled.



Mouse density (95% CI) in Q, M

Deb Wilson



Tracking rates %

Q	100	92	97	95	97
M	0	0	41	39	10

Mouse arboreality, Q block

Neil Fitzgerald

8-20 m above ground, May 2012, 15% tracking
(13 tunnels, 7 nights)

At head height, Nov. 2011, 67% tracking
(15 tunnels, 6 nights)

At ground level, Nov. 2011, 97% tracking (24
tunnels, 1 night)



Mean density cotyledonary (weeks old), mixed leaf (months) and true leaf (years) seedlings in 36 x 0.25 sq. m. plots

Mark Smale, Danny Thornburrow

Block	Q				M			
Species/Size	Cotyledonary	Mixed-leaf	True leaves only	Total	Cotyledonary	Mixed-leaf	True leaves only	Total
Kawakawa	4.7	2.9	0.8	8.3	2.6	0.8	0.8	4.3
Mangeao	0.03	0.03	1.8	1.9	0.1	0	3.2	3.2
Pigeonwood	0.1	0.2	1.8	2.6	0.1	0.03	1.7	1.8
Nikau	0	0	0.5	0.5	0	0	1.6	1.6 *
Kanono	0	0.1	0.3	0.4	0	0.2	0.3	0.4
Supplejack	0	0	0.9	0.9	0	0	1.7	1.7 *
All species	0.6	10.8	8.5	25.6	3.2	2.7	10.1	16



* Indicative $p < 0.1$ on totals only

Fungi

Maj Padamsee, Peter Johnston

- No mice filmed at 'cafeteria' in 48 hours
- Fungal DNA amplified from 14/54 faecal pellets
- Quality DNA sequences from only 3
- Polyporaceae (bracket fungi), Corticaceae (crust fungi)
- Several fungal spores in 12/17 pellets
- Mushrooms, bracket fungi, arbuscular mycorrhizal fungi

Fungi not major diet item?

Pellets not collected at time of main autumn fruiting

Mice impacts on invertebrates

Corinne Watts, Danny Thornburrow, Scott Bartlam, Gary Barker

- Range of small invertebrates and plant material
- Most invertebrates 3–12 mm long
- Caterpillars most common group – spiders, beetles and weta



No. 12

1 mm



No. 46

1 mm

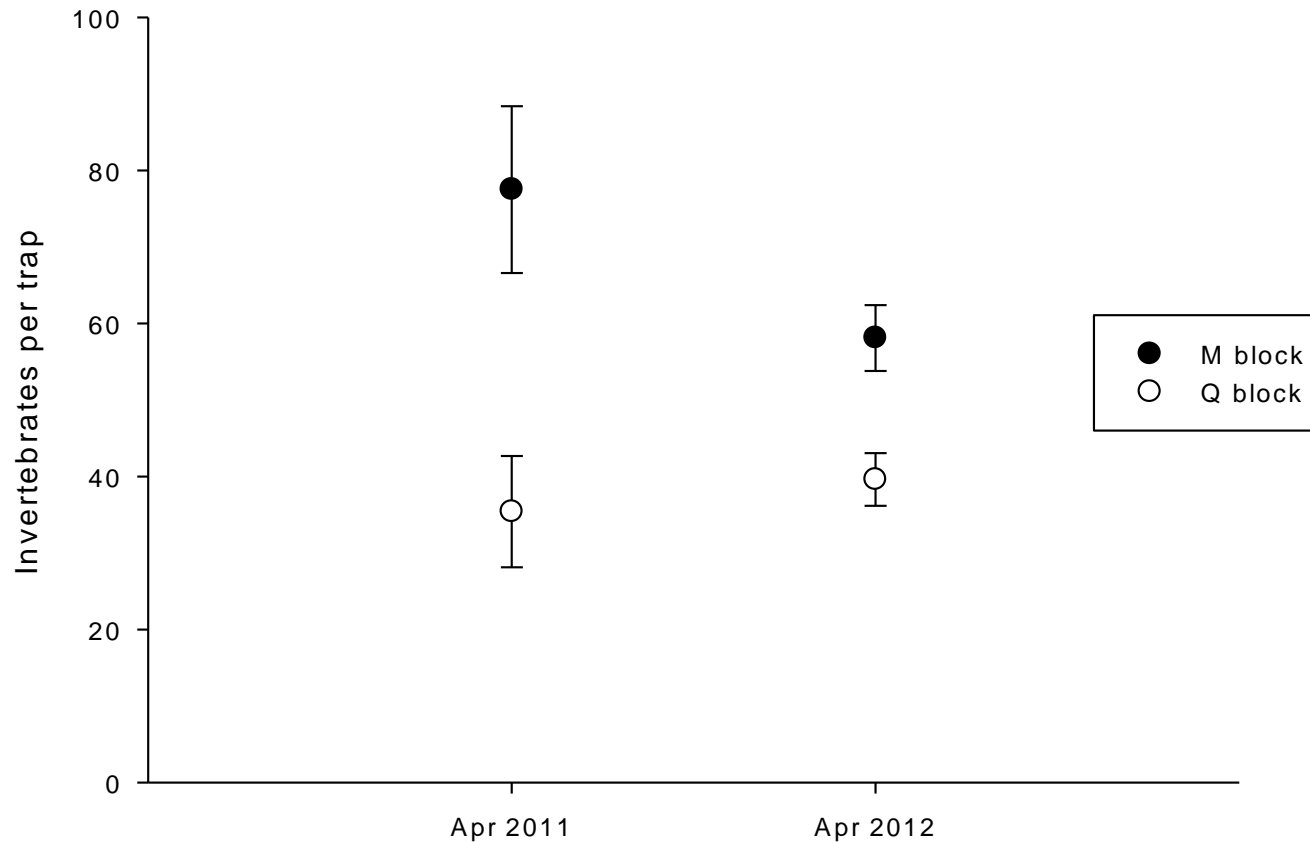


No. 10 1 mm

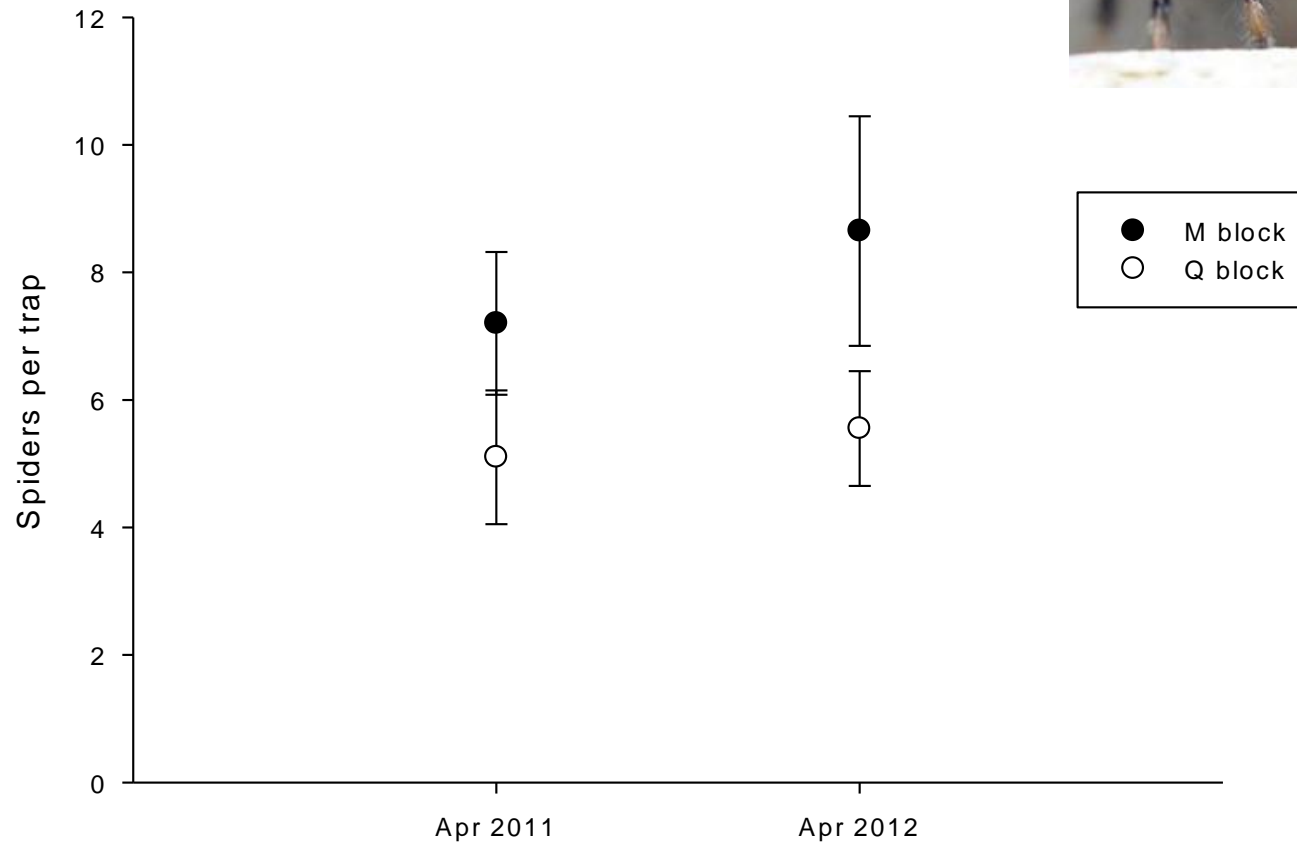
Sampling methods

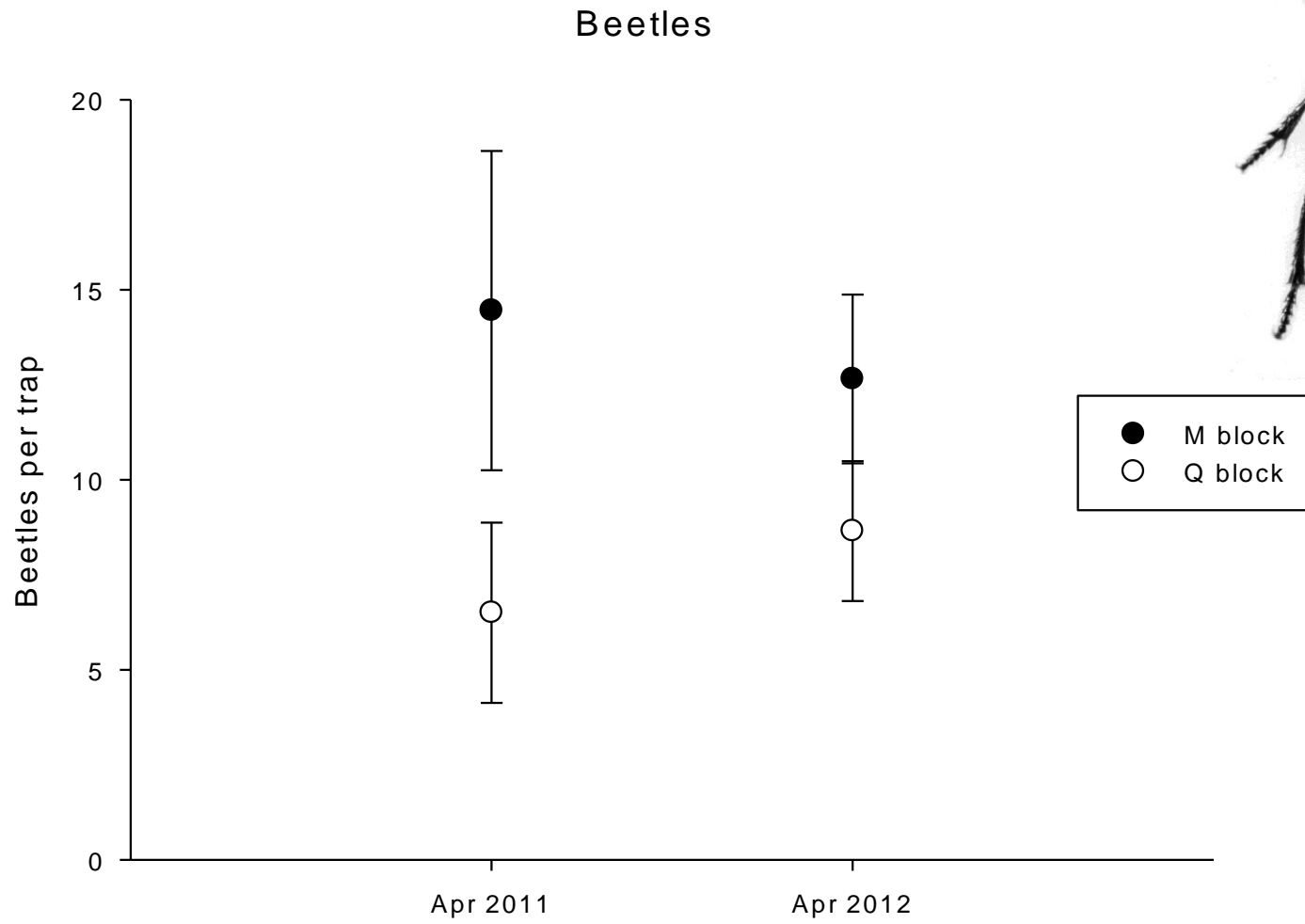
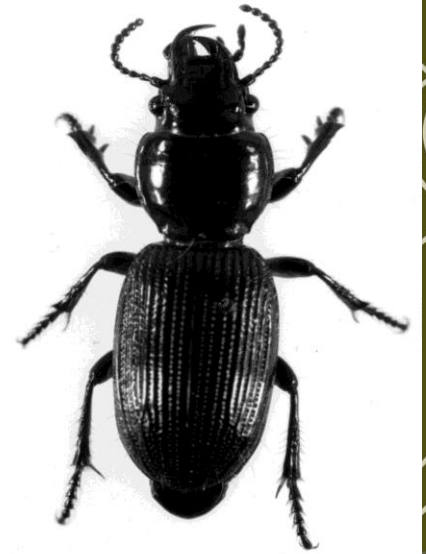
- Pitfall traps – ground-dwelling fauna
- Litter samples – Tullgren funnels
- Targeting invertebrate groups that mice might be feeding on
- Sampled in April 2011 and 2012
- Same intensity in both blocks

Invertebrates – pitfall traps

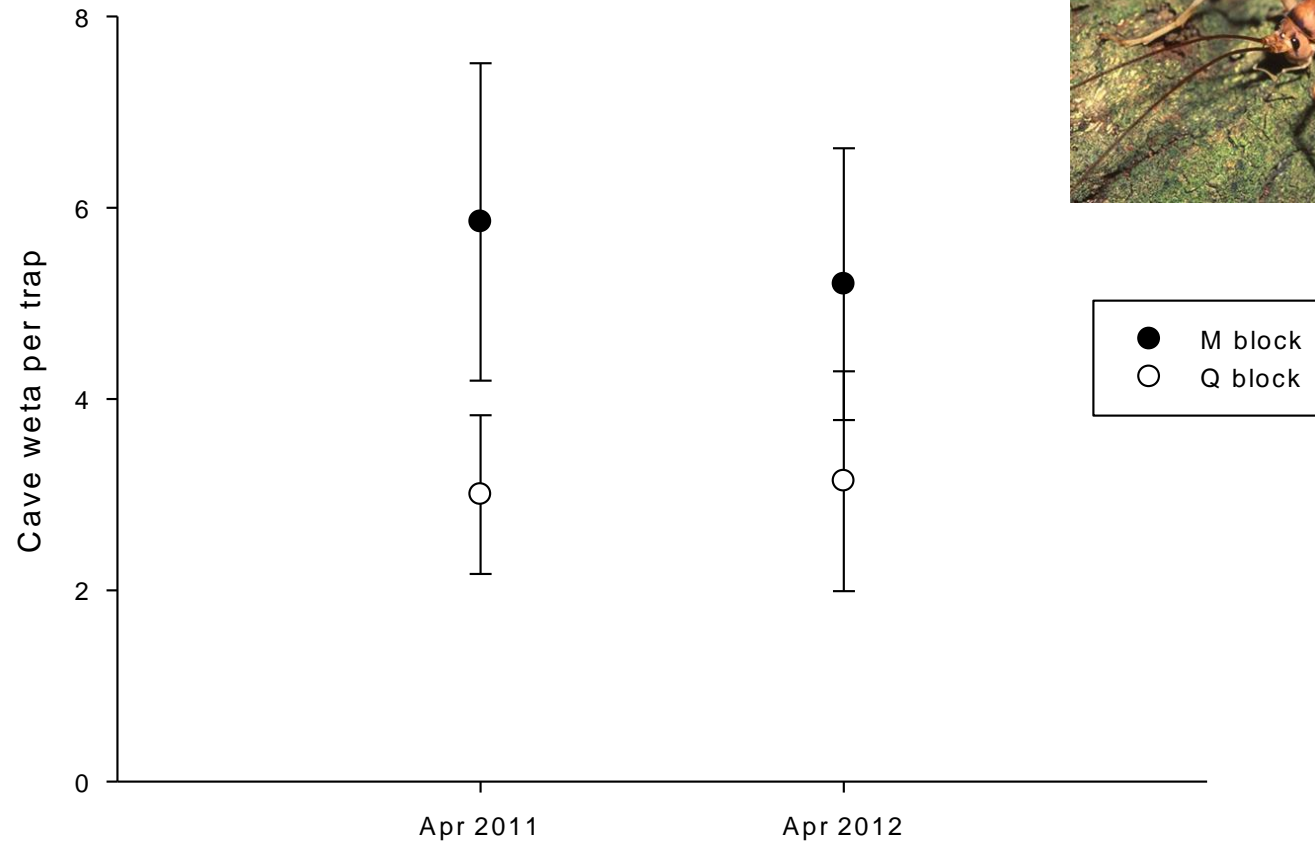


Spiders

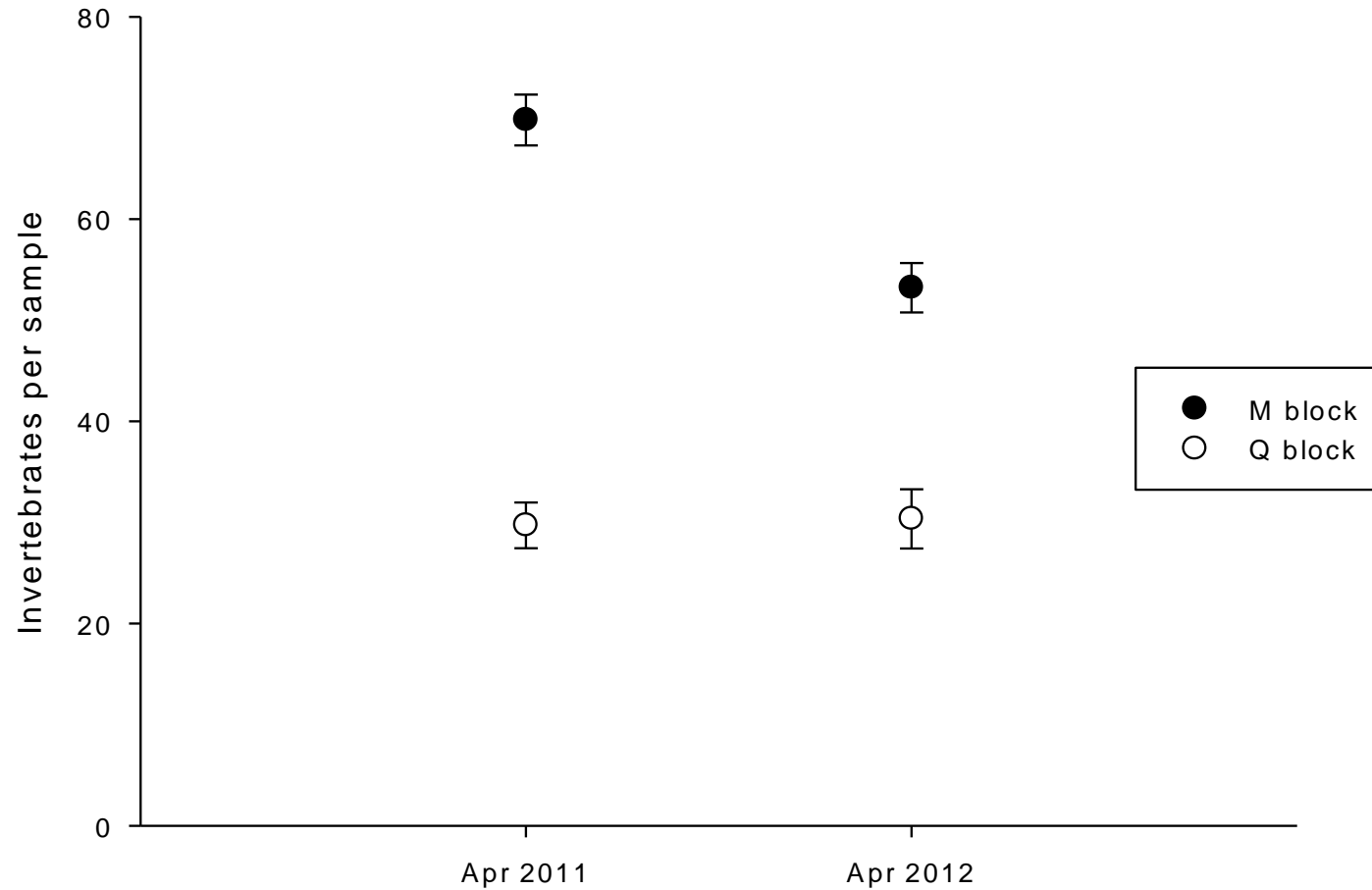




Cave weta

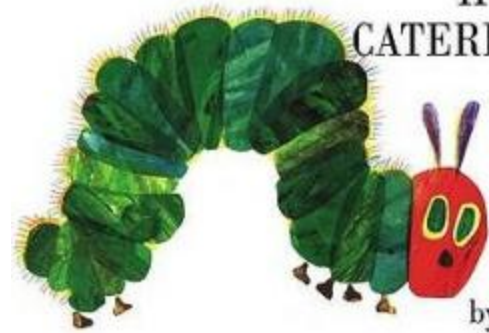


Invertebrates – litter samples

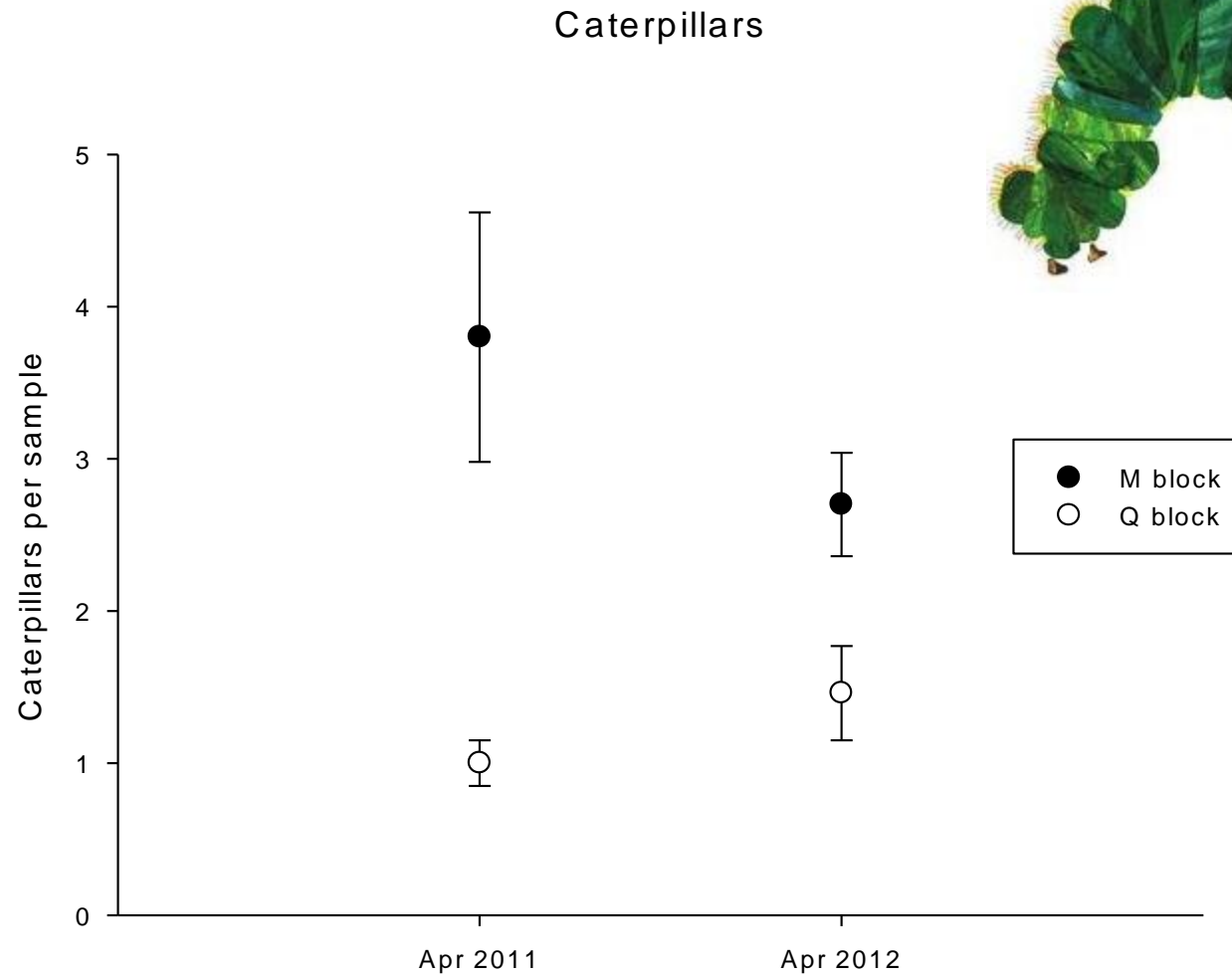




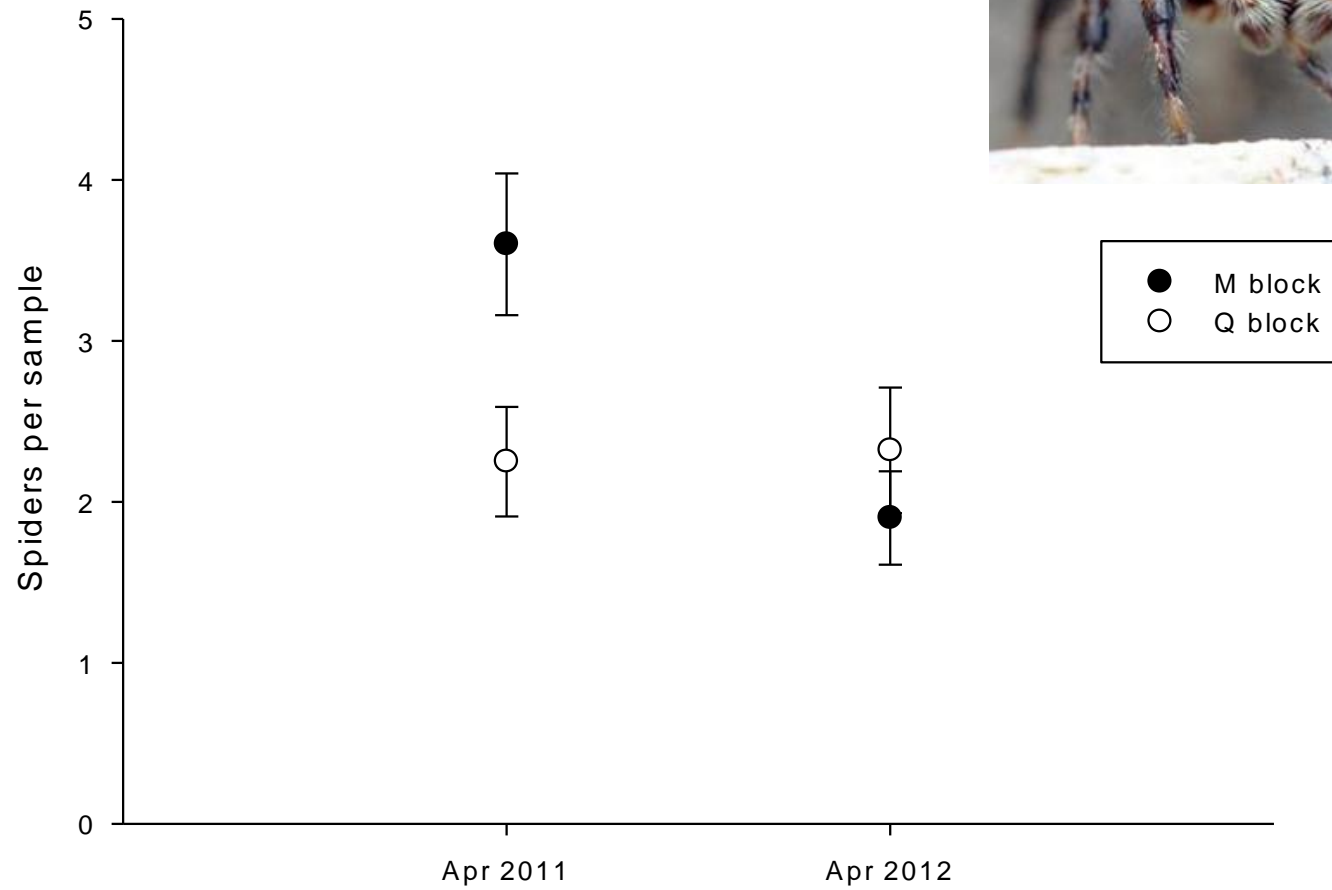
THE VERY HUNGRY CATERPILLAR



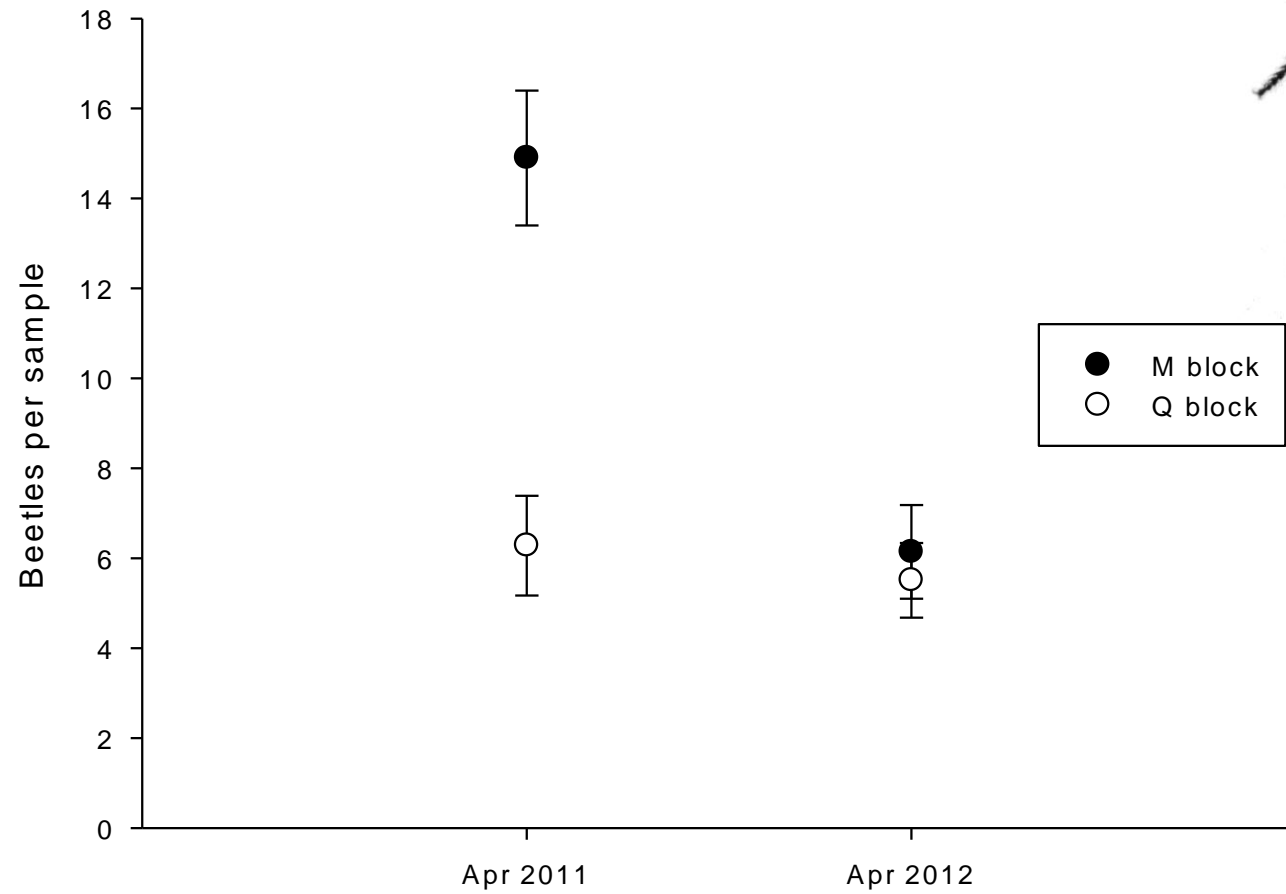
by Eric Carle



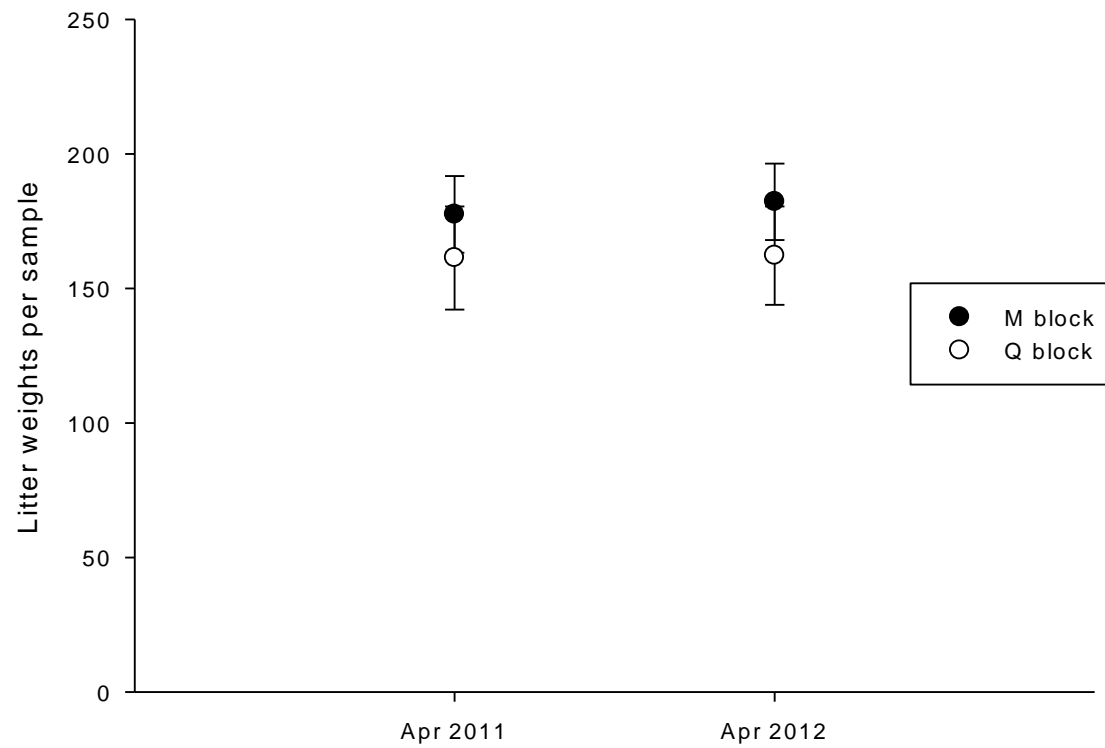
Spiders



Beetles

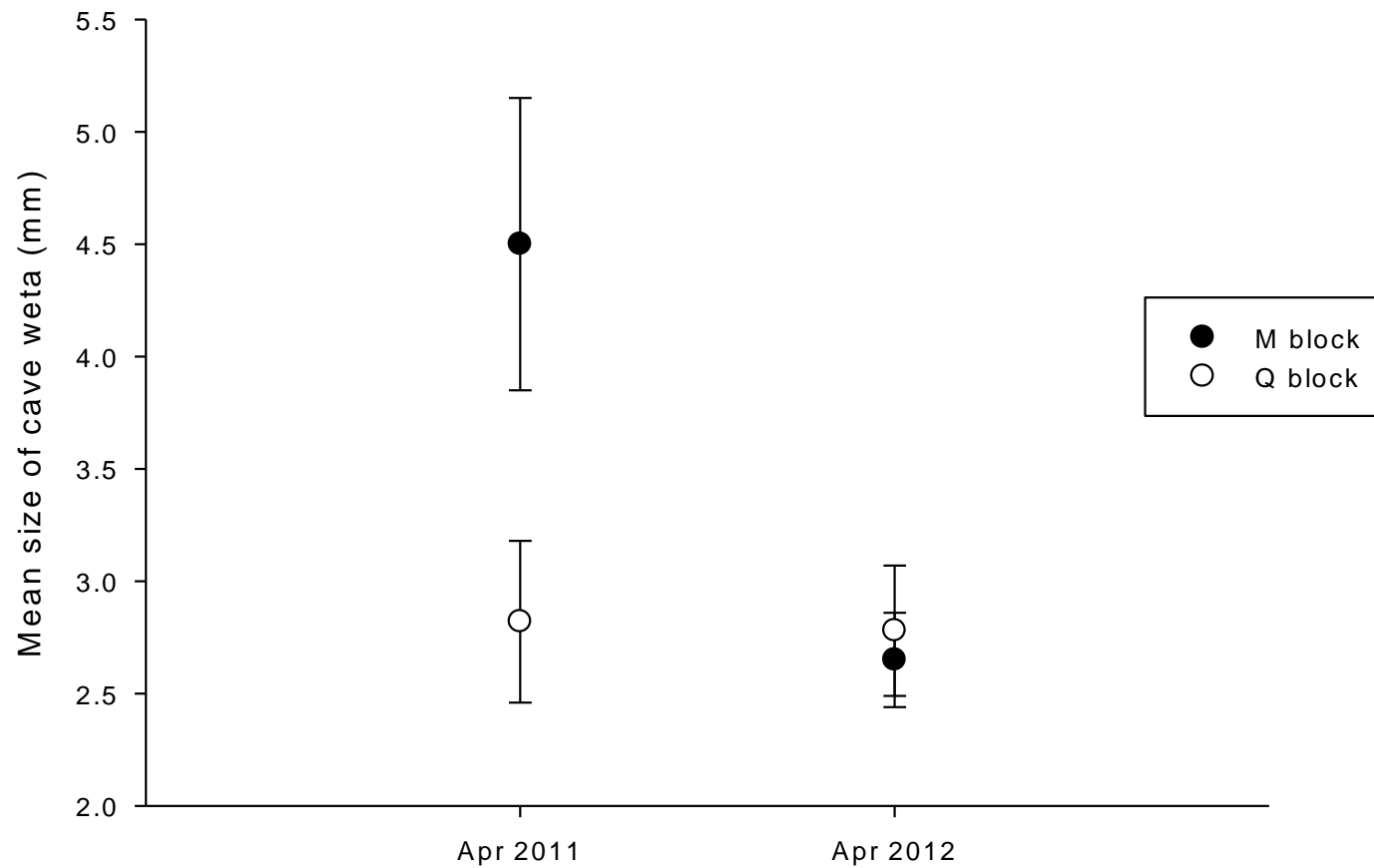


Litter weights per 0.086m² sample





Cave weta size



Conclusions...so far

- Mice appear to be having an impact on invertebrates
- Work in progress – yet to be analysed
- Need to switch treatments
- Both sampling methods tell the same story