Understanding small mammal impacts on endemic invertebrates

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New Zealand wildlife evolved in the absence of mammalian predators and has proven to be particularly vulnerable to some of the mammals introduced since human settlement. It is more generally known that birds have been adversely affected, with over 40% of the pre-human land bird species now extinct. But invertebrate species have also suffered — at least 90 percent of New Zealand's insects are endemic and many of these are now rare or endangered.

Common small mammal pest species found in mainland forests, whose diet includes invertebrates, are:

- Ship rats (*Rattus rattus*)
- House mice (*Mus musculus domesticus*)
- Hedgehogs (*Erinaceus europaeus occidentalis*)
- Stoats (*Mustela erminea*)


David Mudge

Ship rat

Mouse


Don Merton

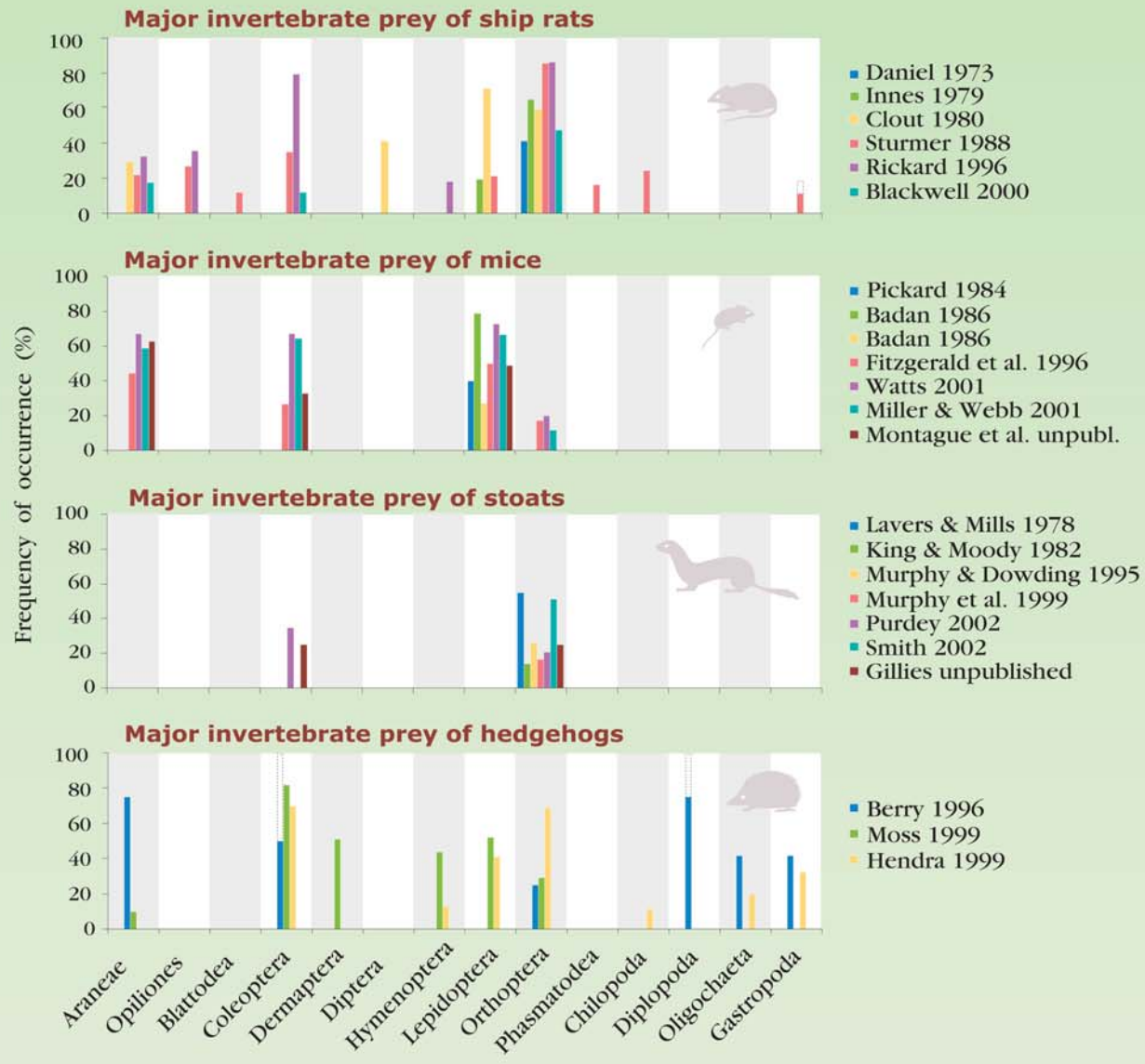

John Dowding

Hedgehog

Stoat

Methods & Results

To help determine the relative importance of invertebrates in the diet of the four pest species, we collated the results from 23 New Zealand studies that contained details of the types of invertebrate prey eaten. The graphs show the frequencies of occurrence (where greater than 10%) of the major groups eaten.



For ship rats, Orthoptera (predominantly weta and grasshoppers) were the most consistent invertebrate prey: their frequencies of occurrence were over 40% in all 6 studies. Araneae (spiders) were common prey in 4 of the studies; adult Coleoptera (beetles) and Lepidoptera larvae (caterpillars) rated in 3 studies.

House mice had caterpillars as the most common prey, occurring in all 7 studies. The other main prey groups were spiders (4 studies), beetles (4 studies) and orthopterans (3 studies).


John Dowding

Weta


Rob Sulsted, Naturespic.com

Tunnel web spider

Stoats in New Zealand appear to restrict their invertebrate diet largely to orthopterans (mostly weta) which occurred in all 7 studies; beetles occurred in 2 studies.

Hedgehogs appear to eat the widest variety of invertebrate prey. Beetles and orthopterans were both common prey in all 3 studies. Gastropoda (e.g. slugs and snails), Oligochaeta (earthworms), spiders and Hymenoptera (e.g. ants, wasps) occurred in 2 of the studies.

Conclusion

Our preliminary analysis shows which invertebrate groups are targeted by the four mammal pest species. This information may help develop guidelines for which predators need to be controlled in specific instances. For example, it would be prudent to control stoats and ship rats if trying to protect a threatened orthopteran, and to control mice if trying to protect a threatened lepidopteran.

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