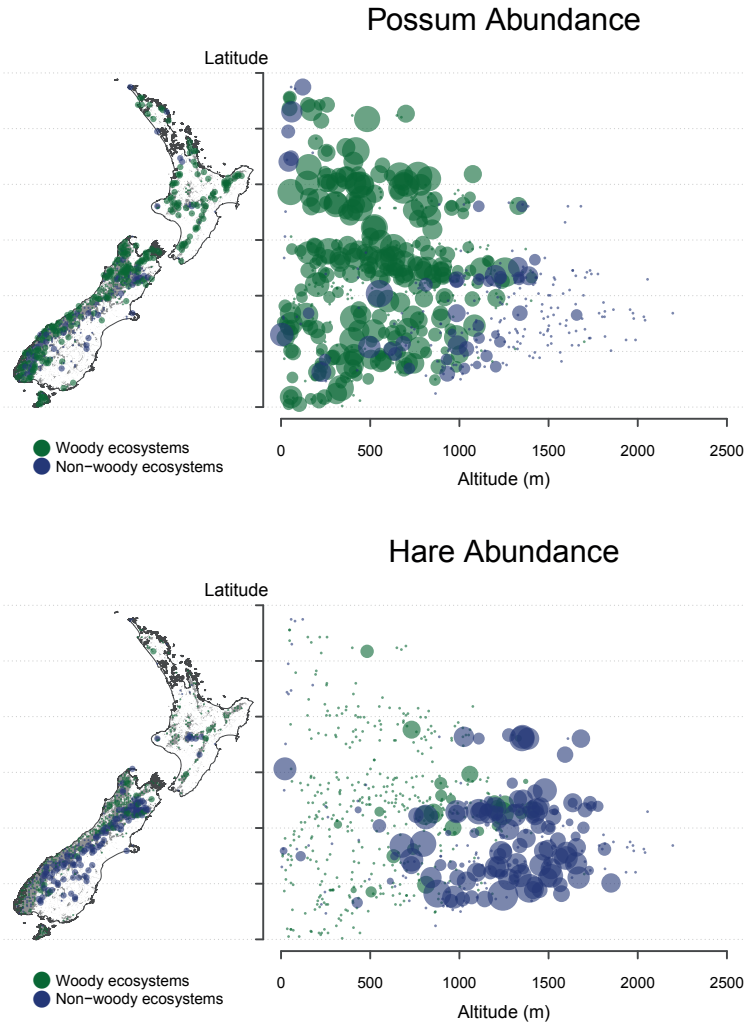
Where are possums and hares most abundant across public conservation land?

Summary

Brushtail possums and hares have invaded nearly all public conservation land. The areas they have invaded are almost mutually exclusive. Possums occur throughout woody ecosystems mostly below 1000 m altitude and rarely up to 1500 m. They are less common in non-woody ecosystems. In contrast, hares occur widely in non-woody ecosystems, mostly between 700 and 1800 m altitude, and are rare in woody ecosystems, occurring mostly above 1000 m. Both possums and hares are affecting ecosystems at and above the treeline, although hares range to much higher altitude than possums. These data highlight the vulnerability of our alpine ecosystems to introduced mammals.

Main findings

- Brushtail possums and brown hares show the most strikingly different patterns of distribution and abundance among the introduced mammals that now occupy public conservation land.
- Possums were widespread throughout woody ecosystems (forests and shrublands) of the main islands (59% of sample locations), with fewer occurrences and mostly lower abundances in non-woody ecosystems (19% of sample locations).
- Possums occurred mostly below 1000 m in altitude; when they occurred above this altitude (to a maximum of 1500 m) they were much less abundant.
- Nearly all hare occurrences on public conservation land were in the eastern South Island, mostly in non-woody ecosystems (59% of sample locations). They were present in very few North Island sites and in few sites in woody ecosystems throughout both islands (6% of sample locations).
- Hares occurred at sites as low as sea level, but most sites were between 700 m and 1800 m in altitude.



The size of the symbol at a sample location is in proportion to the abundance of possums and hares at that point; the smallest point represents a sample location where the possums and hares were not detected.

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Why is this important?

This is the first portrayal of abundance data available at a national scale for these pest mammals. This information defines the scale and extent of invasions by these two pest mammals, which can direct management effort by the Department to reduce their numbers. For example, although possums occupy non-woody ecosystems, they scarcely occur above 1500 m in altitude, so it makes sense to focus control of possums in non-woody ecosystems to areas below that altitude. Conversely, hares are widespread throughout non-woody ecosystems up to very high altitude (alpine) areas, highlighting the need for them to be controlled at altitudes where possums are much less of a problem.

Definitions and methodologies

- This uses information from Measure 2.2.1 ("Distribution and abundance of exotic weeds and pests considered a threat – Pest mammals") assessed across all public conservation land (Tier One systematic national sampling).
- Possum and hare abundances were assessed at 683 sampling locations throughout public conservation land (447 in woody ecosystems and 236 in non-woody ecosystems), sampled between 2011 and 2014.
- Possum abundance was calculated using the Trap Catch Index (TCI), following National Possum Control Association protocols. At each location, four 200 m trap lines were set radiating out from the central 20 m × 20 m vegetation plot, with each line having 10 traps at 20 m spacing. Research led to a change in the possum trap catch method from two nights to one night in 2013. Relative abundance for possums was calculated by dividing the number of captured animals by the number of trap-nights, with corrections made to account for factors such as sprung traps and captures of non-target species. It should be noted that possums can and do occur at locations where none were trapped, as evidenced by possum pellets recorded during faecal pellet surveys for ungulates.
- Hare abundance was calculated using the Faecal Pellet Index (FPI), by counting faecal pellets along four 150 m pellet lines at each sampling location. Individual pellets were counted in a circle of 1 m radius every 5 m, resulting in 30 circular sub-plots per pellet line. The estimate of relative abundance was the total number of pellets counted per line, averaged across the four lines.
- In the figures, all sample points are scattered according to their altitude and latitude. The size of the symbol at a sample point is in proportion to the abundance of possums and hares at that point; the smallest points represent a sample point where possums or hares were not detected.

Where can I find more information (links)

http://www.landcareresearch.co.nz/publications/researchpubs/department_of_conservation_biodiversity_indicators_2013_assessment.pdf