

# POSSUM HOME RANGES: WHY DO SIZES VARY?

FACTSHEET RD12

## WHY HOME RANGES ARE IMPORTANT

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‘Home range’ describes the area traversed by an individual possum in its normal daily activities of feeding, finding a mate and sheltering. Some species defend parts of their home range (territories) but possums do not – their ranges often overlap, meaning many possums can use the same area.

Effective pest management programmes and TB control strategies depend on knowing the home range size because it guides the timing, spatial pattern and deployment duration of control devices and baits, and the size of control buffer zones.

However, the home range of possums can vary in size between different habitats and within or between years – sometimes markedly so – in response to seasonal changes in food availability or breeding activity.

## HOME RANGE VARIATION AND DRIVERS

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If left undisturbed and without population control, forest dwelling possums typically have home ranges of 1–4 ha in New Zealand. Possums in more open habitats have larger ranges – 30 ha was measured in one lowland farmland site without forest remnants; and in upland dryland habitats home ranges cover between 5– 54 ha.

The large home ranges in open habitats have often been attributed to possums having to cover more ground to find widely scattered resources, such as food or shelter. But ‘keeping in touch’ with other possums (especially for finding a mate) in these low-possum-density habitats could be just as important, if not more so.

## WHAT THE RESEARCH TELLS US

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Looking at how home ranges and possum behaviour vary has helped separate the effect of population density from that of habitat quality on home range size.

At one mixed beech forest, possums living at moderately high density in an uncontrolled area had an average home range size of about 3 ha. In contrast, in a similar area just 2 km away where their density had been reduced to moderately-low levels by control, the average range size was 10 ha, more than three times larger. That suggested possums had expanded their home range size in response to reduced possum density.

A more marked example comes from a podocarp–hardwood forest where food is usually abundant, possums are numerous and home ranges are small. However when control reduced possums numbers to just under 0.2 possums/ha, their home ranges expanded hugely to cover 39–160 ha. Possum distribution patterns before and after control also provide useful

insights into their behaviour: one year after control, surviving possums in the podocarp-hardwood forest were highly clustered in a pattern unrelated to their distribution before control, immediately after control or to major topographical features.

Other studies have shown that, following control, possum-to-possum contact rates remain largely unchanged and the breeding rates among the surviving possums are as high, or higher, than in the pre-control populations, regardless of the success of control.

These studies all point to the search for mates as being the dominant factor driving home range size, with habitat quality mainly having an indirect affect via population density. The implication is that individual possums spread themselves more widely over the habitat than they would if it was just a matter of finding enough food and shelter.

## MANAGEMENT IMPLICATIONS

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- In areas that support a high density of possums, the design for the most efficient possum control operation is likely to be different to that for areas where food and shelter are scarce – operators can use more widely spaced traps and baits in the latter. Traps and baits can similarly be more widely spaced in areas where possum numbers have been greatly reduced by previous control.
- Until possums are virtually eradicated, it is unlikely that possum breeding rates will ever decline because possums cannot find mates – when mates become scarce, possums increase home range size and may shift their ranges to form breeding clusters. In fact post-control breeding rates tend to increase due to an increase in resources available for the surviving possums – a high proportion of female possums can start to have two offspring per year rather than one.
- TB transmission rates clearly decrease when possum densities are reduced. However, because of the increase in home range size, the decrease in transmission rates will not be as great as the reduction in possum density. The implication is that, to break the TB cycle, possum control has to be imposed more intensively or for longer than if possums did not expand their home ranges.

## LINKS TO RELATED TOPICS

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- Rouco C., Norbury G.L., Smith J., Byrom A.E., Pech R. 2013. Population density estimates of brushtail possums (*Trichosurus Vulpecula*) in dry grassland in New Zealand. *New Zealand Journal of Ecology* 37: 12–17.
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