Eco Gene
DNA-based diagnostics

Case Study #2

Are some possums unable to be trapped, poisoned or monitored?

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Aim: To determine whether a proportion of wild possums never respond to traps or poison

Background: The effectiveness of possum control is presently assessed using the Residual Trap Catch Index (RTCI), in which the number of possums caught per trap night is compared with an operational target (usually between 1 and 5% catch rate). However, pest managers sometimes record low or zero RTCIs immediately following control but several months later find possums to be surprisingly abundant. Determining the size of this bias, and the causes of it are high priorities.

Non-invasive method used to obtain DNA: Faecal pellet analysis. Possums produce around 100 faecal pellets each night, scattered around their home range. Each pellet is coated with a thin layer of mucous that contains cells from the lining of the lower intestine. DNA from these cells can be used to obtain the unique genotype of individual possums.

Study design: To determine whether the possums were susceptible to trapping and poisoning, faecal DNA was matched with ear-tissue DNA taken from the trapped or poisoned animals in Haldane Forest in the southern South Island. A pre-control 'trap and release' survey was conducted over a 100-ha site in a Southland forest just before a control operation. Tissue from those trapped possums were compared with faecal pellet DNA and provided a direct measure of 'trappability' of possums at that time. Possum control was then undertaken using Feratox® followed by cyanide paste. Trapping and pellet surveys were repeated 1, 4 and 9 months later. Locations of all trapped possums and faecal pellets collected were logged by GPS and the distances between 'records' calculated for individual possums.

Conclusions: Faecal DNA genotyping of possums enabled us to conclude that:

(i) many possums become trap-shy for about 3 days after initial capture.
(ii) extended trapping sessions tend to remove the most trappable possums first.
(iii) previous capture is unlikely to have a major long-lasting effect on the average trappability of possums in the subsequent re-surveys, as these were all conducted several months apart.
(iv) immediately after control, many surviving possums may not encounter traps due to restricted movements or because they are active mainly in the canopy. A substantial proportion of possums are difficult to trap in a single session.

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