

CASE STUDY

Review of an eradication programme – red foxes in Tasmania

The general issue

Prompt responses to intercept and eradicate a new invasive species are assumed to save either the costs of a later full-blown eradication or costs for the ongoing sustained control if eradication fails, and the ongoing impacts of the pest.

Such a precautionary approach is best if the impacts of the pest are predicted to be severe and if there is a reasonable chance that the pest can be eradicated. However, in the early stages of developing such responses managers often lack the precedents for judging success, or do not have key information about the invasive species' ecology and behaviour.

The process taken under the precautionary approach in cases where uncertainty is high is to learn and adapt as the eradication attempt proceeds.



The challenge of foxes in Tasmania

European red foxes (*Vulpes vulpes*) have been a common pest on mainland Australia since their introduction in the 1860s, but had not established on the 6 million hectare island of Tasmania. However, in 1999 foxes were reported to have been released in Tasmania. Public reports of foxes and predictions that predation by foxes could put 78 of Tasmania's native vertebrate species at risk led the Tasmanian Government to establish a task force that has been attempting to eradicate the animals.

The problems faced by the taskforce are daunting. Foxes are not easily detected. There are few animals, the area of the incursion is unclear, and public reports have proved unreliable as many turn out to be of other species. In recent years foxes have been detected with certainty by searching for faecal scats and testing for fox DNA. This has shown that low numbers of foxes are present over at least half of the island.

The only effective control method is buried baits containing the toxin 1080 – the main control method on mainland Australia. The non-target impacts have been assessed as biologically acceptable, but the method is unsuitable in urban and peri-urban areas where pet animals are at risk. Baiting is conducted currently over about 600 000 ha of rural land every year in Tasmania. This has not killed all foxes potentially exposed as new faecal scats continue to be found in areas previously baited, and it does not provide direct evidence of success as victims are not locatable.

These problems and uncertainties led the taskforce to commission ISI to review their progress up to 2009, and to provide a fresh view of whether eradication was achievable within a realistic timeframe and budget.

(continued...)

Our approach

The key finding of our review was that the processes used to locate foxes and those used to kill them were not integrated. The reasons for this were complex:

- (a) There are time lags between a plausible report of a fox and assessment of its reliability, or between the location of a putative fox scat and its validation by DNA analysis as a fox – rather than a cat, a dog, or a native carnivore.
- (b) It takes time to organise any baiting in response to positive indications of a fox. For example, there are legal procedures to follow and consents to gain from landowners.
- (c) There is considerable uncertainty about the behaviour of a fox during these time delays. Curiously when one fox scat is found (and the DNA shows it belongs to a particular individual) no other scats of that fox have yet been located. One explanation is that these colonising foxes are at very low density and have very large home ranges – with obvious implications for reactive baiting if the lags are too long.
- (d) Overlaying maps of baiting with the locations of the confirmed presence of foxes showed some foxes were never put at risk, some baiting occurred in areas where no foxes were reported, and some foxes were present after an area was baited – they survived or were immigrants from adjacent unbaited areas.

Our recommendations to manage these problems included recognising that foxes were widespread in rural landscapes, so a precautionary approach to the initial baiting could be followed. That is, carry out baiting over the 3 million ha. of prime fox habitat irrespective of the monitoring to locate foxes. However, some foxes (maybe 20%) are likely to survive baiting judging by the results of control on the mainland. Therefore, post-control monitoring and prompt reaction with further control where survivors are detected would be required.

Our report also suggested there is a need to develop new control methods to put these survivors at risk (perhaps they will never eat the baits) and to deal with urban foxes. We recommended dogs trained to locate foxes in their lairs, a method used for other predator management problems elsewhere in the world.

Post-control monitoring at practical intensity will normally detect no fox scats. The issue is then to interpret these zero results in terms of the likelihood that 'no detections equals no foxes'. The programme has already measured the capabilities at finding scats of both trained dogs and teams of people and we developed a model to inform decisions on where to search and when to stop searching. The model incorporates expert opinion and field data to identify high priority areas for surveillance, quantify the probability of local extirpation following control, and provide a broad scale probability of eradication for Tasmania.

Given the programme managers continue to learn and adapt, we concluded that eradication was still possible.

References

- Parkes, J.; Anderson, D (2009). Review of the program to eradicate foxes (*Vulpes vulpes*) from Tasmania. Landcare Research Contract Report LC0809/176.
- Parkes, J.; Ekanayake, J. (2009). Use of telemetered foxes in the Tasmanian Fox Eradication Program. Landcare Research Contract Report LC0910/37.

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