FERRET CONTROL - KILL TRAPPING

TECHNIQUE

Trap layout

- Effective population control requires an extensive trapping layout: place trap stations along linear landscape features (fence lines, forest edges, waterways, roads and tracks), in isolated patches of cover and other preferred microhabitat, around farm buildings and offal pits and in areas with high prey abundance. These features consistently catch more ferrets[1].
- For broad-scale control, trap lines no further than 800 m - 1 km apart and trap stations placed up to should be approximately 200m apart [2]. There should be at least one trap station within each ferret's home range. In the South Island, ferrets have large (18-760ha), often over-lapping home ranges [1]. Note: ferret home ranges vary substantially between sites [3].
- Traps can be set either as single or double sets. The decision to use single or double sets is a site based decision related to the size of the area and budget. If using single set traps, the spacings between traps should be decreased to increase the trap encounter rate or the frequency of servicing increased, especially where rats are getting caught in any abundance.
- A good track infrastructure is important and each trap station numbered for ease of relocation and data collection. This reduces the risk of missing a trap during checking and allows capture data to be related to each trap site.
- Good boundaries and buffer zones should be used to reduce re-invasion. Use natural barriers e.g. large waterways where possible.

Timing of operations

- Timing is critical and depends on the species being protected, and the biology of ferrets and their prey at the site. Example 1: To protect kiwi chicks, ferrets need to be controlled all year because adults, chicks and eggs are vulnerable. Example 2: To protect yellow-eyed penguins, control ferrets for >6 months of the year from laying in September to March when the chicks fledge.
- Ferrets are more difficult to trap in winter and spring, which is unfortunate because otherwise these are the best times to control populations since they are reduced by high natural mortality at these times. In summer, juveniles are in the dispersal phase so sites that are controlled are likely to 'refilled' rapidly by immigrants. On balance, the best time to control ferrets is probably autumn. By then, some natural mortality will have occurred, most juvenile dispersal has finished, and trappability is still high

Efficient use of traps

- Traps should be left out permanently. Capture rates of female ferrets are faster where permanent traps are used, and permanent traps catch more ferrets [4].
- The frequency of checking traps will depend on (i) trap occupancy rate (of both target and non-target species), and (ii) field life of the bait (see below) used. Frequency of checking may vary from weekly between January and May when ferrets are most trappable, to monthly between June and December when ferrets are harder to trap and when meat baits last longer.

EQUIPMENT

Trap type

Key requirements are: catch effectively, kill humanely, easy to use and maintain, light weight, portable and cheap. Traps have been assessed against the National Animal Welfare Advisory Committee (NAWAC) standard for killing-performance with the following results:

Belise SuperX	Fail
Conibear 120	Fail
DOC 250	Pass
Holden Multikill	Fail
KBL tunnel	Fail
Possum Master	Fail
S&F	Fail
Set n Forget	Fail
Timms	Fail
Tunnel trap	Fail
Warrior	Fail

- The DOC 250 is therefore recommended, as it is the only trap that has so far passed the NAWAC standard for use against ferrets.

Maintenance of traps

New Traps

The DOC traps do not require initial treatment.

Traps in use

- DoC provides excellent detail on trap-setting for the recommended DOC 250 trap.
- Traps should meet a spring-off standard of a 100-150 g weight placed on the trigger plate.
- Traps should be regularly cleaned with a wire brush. This removes mould, fur and bits of dead animals and allows for identifying what has escaped from an empty sprung trap.
- Un-sprung traps must be set off at regular intervals (i.e. during inspection regime). Un-sprung trigger mechanisms can rust, resulting in slow set-off times which risk missed or poor captures.
- A formalised maintenance regime is important. Traps must be regularly maintained, including checking for worn pivots, weakened springs. Fenn traps require periodic re-application of the protective coating.

Tunnel/Cover

Kill traps must be set in a tunnel or under a cover. A tunnel has three functions: i) orientate the animal relative to the trap, ii) disguise and protect the trap and iii) keep out non-target species [2]. It must have the following:

- Be made of solid material. Kiwi can poke their bills through tunnels made of wire mesh.
- Where weka are present the tunnels need to be long enough to prevent them accessing the traps and have a solid base. Weka are highly inquisitive, including digging under the cover to access lures.
- Tunnel width must match the trap being used.
- Double baffles at entry ends to restrict ‘probing’ by kiwis, weka and other non-target species.

- Entry holes that allow ferrets to enter but restrict non-targets. Correctly positioned, the holes help make the animal step onto the trigger plate.
- 'See through' at either end. Ferrets are probably similar to stoats which prefer open tunnels to blind end tunnels [5].
- Solid anchorable design to prevent traps being disturbed by pigs and possums.
- Removable roof to provide easy access when checking/setting traps.
- Bait positioned and well-secured to prevent removal by rodents.

Baits

- Key elements are: high palatability, a field-life aligned with the frequency of checking, doesn't attract non-targets, easy to use and cheap.
- The most effective baits may differ with location and the natural diet of ferrets in that location.
  Ferrets change their diet in response to changes in availability of their main prey [1].
- Effective baits include:
  1. fresh or salted rabbit, hare, or possum[6],
  2. fresh/frozen/salted fish
  3. fresh hen eggs (especially if stoats are also being targeted) [1]
  4. dehydrated meat baits (e.g. Connovation's dehydrated Erayz bait, or Trappers Cyanide mustelid bait)
- Trapping rates are higher if an attractant is provided [7].
- Baits should be changed regularly (timing depends on environmental conditions) and disposed of away from the trap. Rotting baits close to traps may deter ferrets.
- Pre-baiting traps may increase capture rates.

LIMITATIONS

- There is no "window of opportunity" post control as numbers quickly return to pre-control levels.
  Ferret populations recover rapidly through immigration [1].
- Female ferrets are particularly hard to trap during June to December [8].
- Intensive trapping of large areas is labour intensive.

SUSTAINING CONTROL OVER THE LONG TERM

- Monitoring of conservation outcomes is essential to judge effectiveness of the control programme.
  Control operations are useless unless outcomes are achieved.
- Tracking tunnels should be run concurrently with the trapping operation and data collected should be related back to any conservation outcome measures. Tracking tunnels can provide an independent measure of the operation's effectiveness and can also identify activity of animals present but not being trapped.
- Achieving outcomes from predator control are long-term and often control must take place for 5 years+ to get results. Funding must be in place for long-term control.
- Baits may have to be alternated and/or combined over the duration of control programme.
  Ferrets are flexible and opportunist in their diet, so a change in abundance of their normal prey can cause a rapid shift to alternative food resources [9].
- Good data collection helps operations to be more effective and efficient over the long term. What is recorded depends on what the project wants to know.

- Trapping rates are highest in late summer to autumn [8], but at this time of the year mainly juveniles are trapped, leaving enough breeding animals to maintain abundance [10].
- Continuous control throughout the year needs to remove at least 50% of the ferret population to achieve a 50% suppression in the long term average density [11].
- It is important to maximise trap efficiency by selecting the correct trap type, lure, layout, seasonal timing, and length of operation [9].
- Dogs trained to target ferrets under DOC's national predator dog programme can be useful to check for the presence of ferrets and areas that require additional traps.

REFERENCES

1. Clapperton BK, Byrom A (2005) Ferret. In: King CM, editor. The Handbook of New Zealand Mammals. 2nd ed. Melbourne: Oxford University Press. pp. 294-307.
2. King CM, O'Donnell CFJ, Phillipson SM (1994). Monitoring and control of mustelids on conservation lands. Part 2. Field and workshop guide, 4. Department of Conservation, Wellington, New Zealand.
3. Caley P, Morriss G (2001) Summer/autumn movements, mortality rates and density of feral ferrets (*Mustela furo*) at a farmland site in North Canterbury, New Zealand. New Zealand Journal of Ecology 25: 53-60.
4. Byrom AE, Spurr EB, O'Connor CE (2002). Ferret Neophobia to traps, LC0102/082. Landcare Research, Lincoln.
5. Brown S (2001) The behavioural responses of stoats (*Mustela erminea*) to trapping tunnels. [M.Sc.]. Lincoln, New Zealand: Lincoln University. 126 p p.
6. Moller H, Hamilton B (1999) Predator control: the game keeper's gift. Fish and Game New Zealand.
7. Clapperton BK, Minot EO, Crump DR (1989) Scent lures from the anal sac secretions of the ferret *Mustela furo* L. Journal of Chemical Ecology 15: 291-308.
8. Ragg JR (1997) Tuberculosis (*Mycobacterium bovis*) epidemiology and the ecology of feral ferrets (*Mustela furo*) on New Zealand farmland [Unpublished Ph.D.]. Dunedin, New Zealand: University of Otago.
9. King CM, Griffiths K, Murphy EC (2001) Advances in New Zealand mammalogy 1990-2000: Stoat and weasel. Journal of The Royal Society of New Zealand 31: 165-183.
10. Caley P (1996) The efficacy of trapping for reduced ferret abundance. The Royal Society of New Zealand Miscellaneous Series 36: 73.
11. Barlow ND, Norbury GL (2001) A simple model for ferret population dynamics and control in semi-arid New zealand habitats. Wildlife Research 28: 87-94.