

Controlling Mustelids for Conservation in New Zealand

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Outline

- Introduction and NZ History of these predators
- Management considerations
 - ecology and biology
- DOC Best Practice
- Future



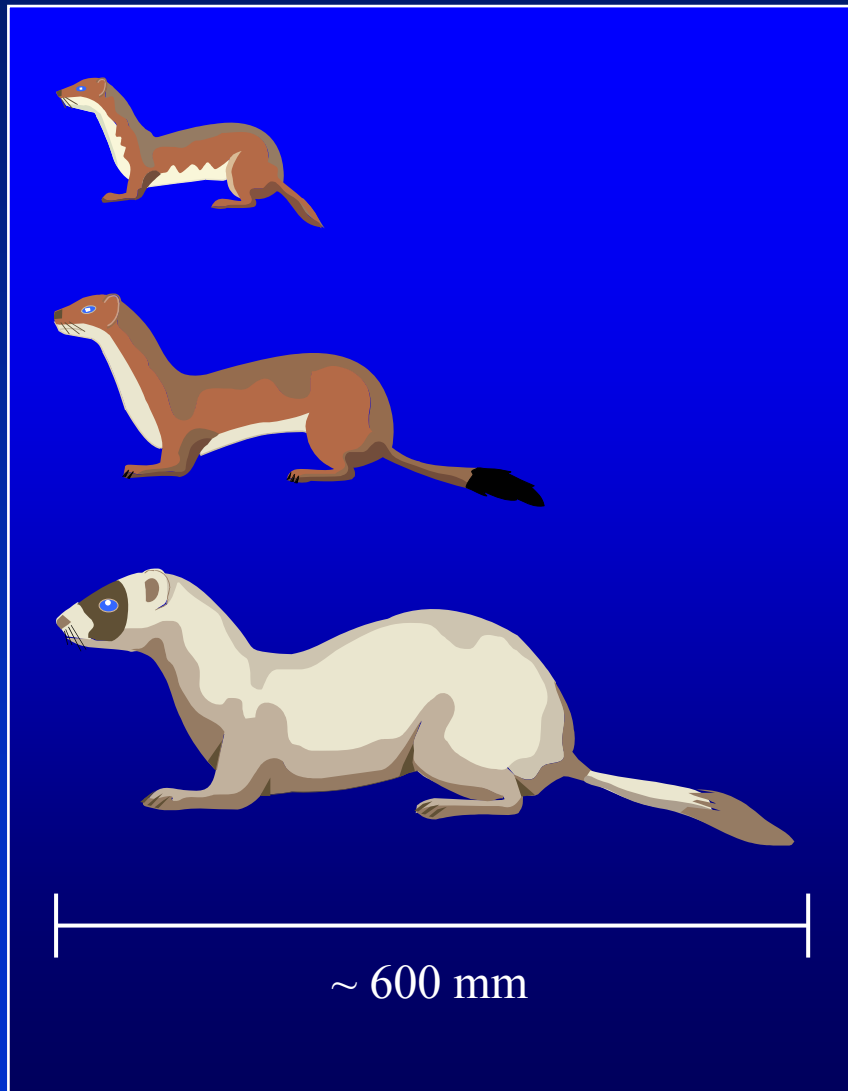
Photo: R. Morris



History of mustelids in New Zealand

- 1870's rabbits a serious agricultural pest in New Zealand.
- Mustelids introduced to control rabbits
 - ferrets in 1879
 - stoats and weasels in 1884
- Now mustelids are widespread throughout New Zealand with the exception of some offshore islands

The Three Mustelids in New Zealand



Weasel (*Mustela nivalis*)

Variable line between brown and white
Short tail, no black tip

Stoat (*Mustela erminea*)

Straight line between brown and white
Longer tail with black tip

Ferret (*Mustela furo*)

Dark face mask
Stockier and much larger



Mustelids and New Zealand's Native Birds

- Evolved in the absence of mammalian carnivores
 - poorly adapted to cope
 - impacts still occurring



Photo: R. Morris



Photo: R. Cole



Photo: M. Aviss



Photo: M. Soper



Photo: D. Crouchley

Controlling stoats on the New Zealand Mainland

- Late 1980's
 - thought to be impractical & unnecessary!
- Early to mid 1990's
 - possible to protect native birds from mustelids using Fenn traps
- Present day
 - still use traps, but over much larger areas
 - Animal Welfare Act 1999
 - Fenns or DOC series



Photo: J. A. Mills



Photo: DOC

When managing mustelids think about:

- What are you trying to protect?
- Mustelid ecology
 - breeding & seasonal abundance
 - feeding and hunting habits
 - home ranges
 - interactions with other pests



Photo: D. Peters

Know what values you are trying to protect

- Set result monitoring targets for mustelid control
- Tie these in with your management of the species you are aiming to protect
 - Outcome monitoring



Photo: J. Waikare



Photo: G. Sherley

Protecting native forest birds from mustelids

- Vulnerable whilst nesting
- Mustelid (plus rat and possum) abundance needs to be very low
 - (not detected in TT's)
- Should be reduced before nesting starts
- Monitor the birds you are hoping to protect



Photo: D. Veitch



Photo: J.L. Kendrick



Photo: R. Powlesland

North Island Brown Kiwi

- Chicks vulnerable to stoat (& feral cat) predation
 - 95% die without management intervention
 - vulnerable for most of year
 - particularly so during period of peak stoat abundance



Stoat Breeding

- Delayed implantation
 - Most females (99%) are in the inactive phase of pregnancy between November - August
- The number of young born is dependant on spring food supplies
 - This enables the stoat to rapidly capitalise on times of abundant prey



Stoat litter size and dispersal

- Large litters potentially up to 20 kits but usually 4-8
- Disperse over large areas very quickly
 - records of 6-23 km within a few weeks
 - one record of a female covering 65km within 4 weeks



Photo: N. Coad

Weasel breeding

- No delayed implantation
 - season September to March
- The number of litters is dependant on food supplies
 - physiologically females could produce three in a year but this is very unlikely
 - average litter size about 4-5 kits
- Young animals appear January to May



Photo: D. Thompson

Ferret breeding

- No delayed implantation
 - season August to September (could last to March)
- Usually only have one litter a year
 - females could conceivably produce two in a year
 - litter size usually about 4-8 kits



Photo: J. Ragg

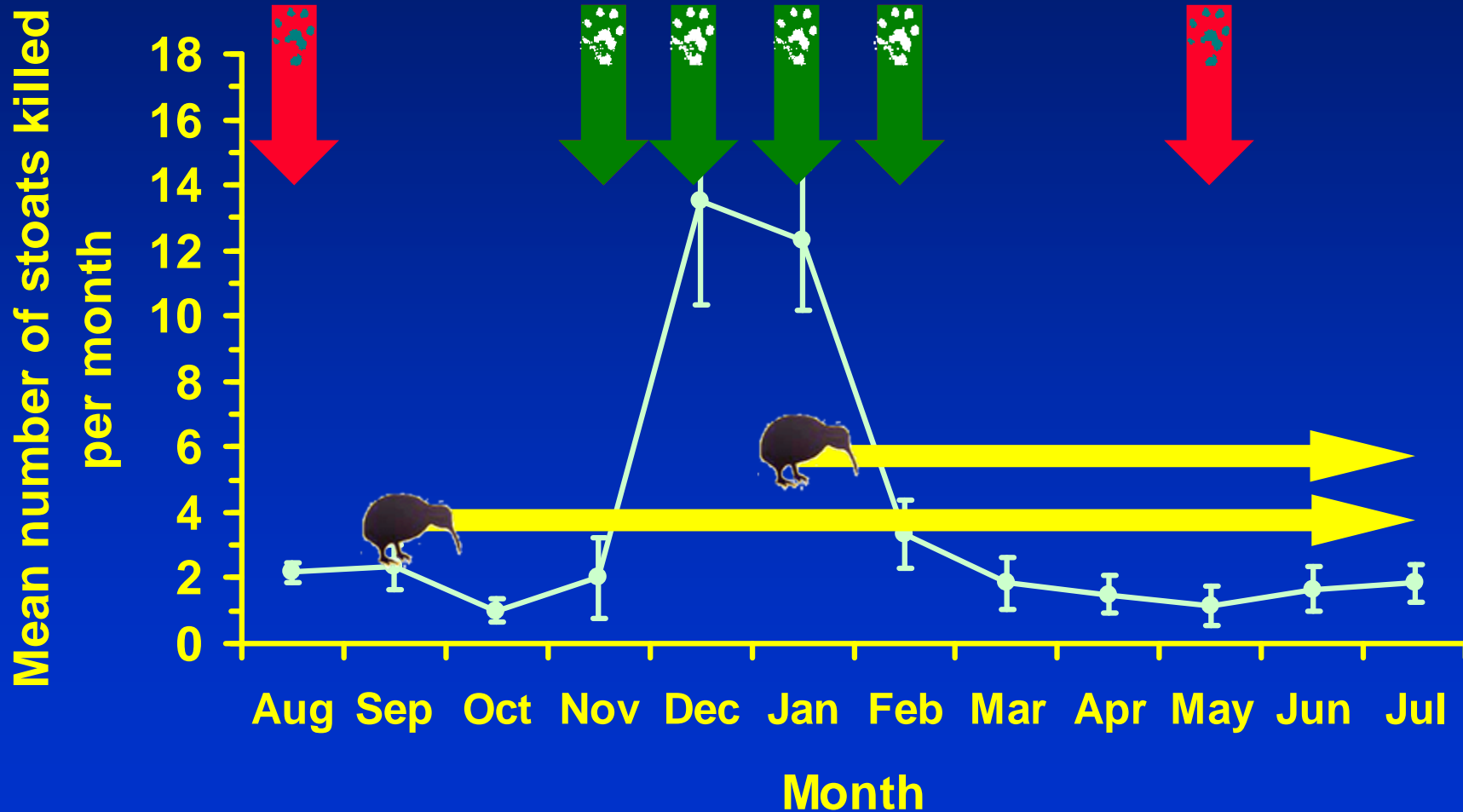
Seasonal Abundance Patterns

- Mustelid Juvenile Dispersal
 - Stoats December - January
 - Ferrets February - March
 - Weasels January - May
- Differences between years are related to prey abundance
 - Beech forest mast years
 - Heavy podocarp fruiting years?



Photo: J. Dowding

Stoats killed at Trounson August 1996-July 2002



Feeding and hunting habits

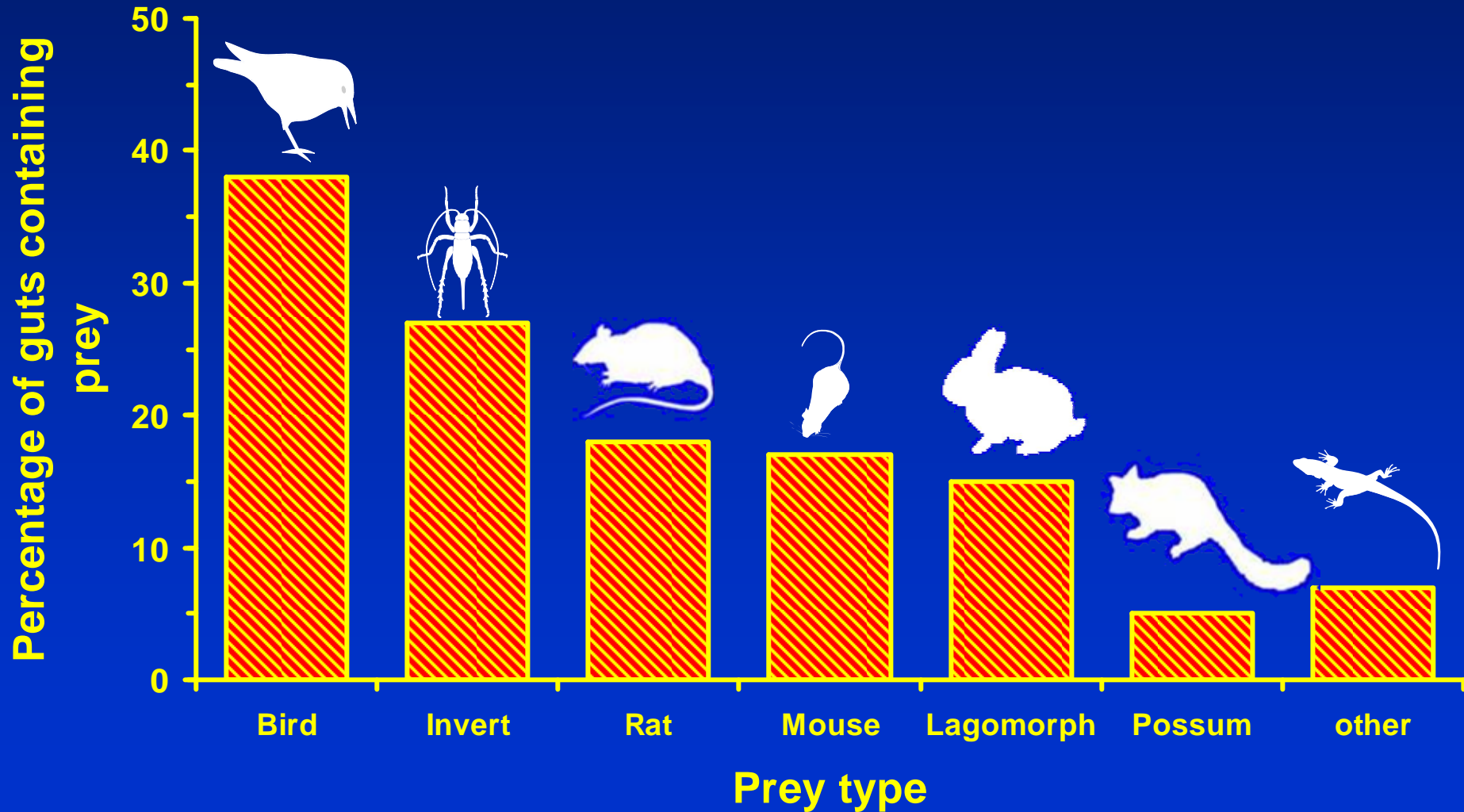
- Stoats are very active hunters
- They use sight, hearing and scent when hunting
- They kill quickly and efficiently
- They will tackle prey much larger than themselves
- They often kill and cache prey for future feeding



Photo: W. Hutchinson

Stoat Diet in New Zealand

(averaged from 8 studies)



Weasel diet from four studies around NZ

- Mice 47% (33-70)
- Invertebrates 28% (5-30)
- Birds 24% (6-30)
- Lizards 23% (10-39)
- Rats 4% (0-12)
- Lagomorphs 3% (0-12)



Diet from thirteen studies around NZ

- Lagomorphs 61% (10-86)
- Invertebrates 19% (10-38)
- Birds 17% (0-50)
- Reptiles 8% (0-20)
- Possum 7% (0-70)
- Mice ~4% (0-16)
- Rats ~2% (0-10)



Photo: P. R. Clerke

Ranging and activity patterns

- Stoats, especially males, have large home ranges and these can vary in size throughout the year
- Apart from when young they are solitary animals
- Activity characterised by bursts of movement
- During these brief hunting sorties they get around the core parts of their ranges very quickly



Photo : DOC

Home ranges of stoats in New Zealand

♂ mean home range size
estimated from 10 studies
147 ha (16-313)

♀ mean home range size
estimated from 9 studies
79 ha (9-127)



Photo: DOC

Mean home range sizes of weasels and ferrets

- ♂ weasels from one overseas study
 - 24.2-216 ha
- ♂ ferrets from eleven NZ studies
 - 199 ha (19-760)
- ♀ ferrets from eight NZ studies
 - 122 ha (18-265)



Interactions between mustelids and other pest mammals

- Increases in prey abundance can lead to increases in mustelid abundance
- Stoats are the most important predator of rats in New Zealand forests
- Competition probably occurs between stoats and weasels in some environments



What other factors need to be considered?

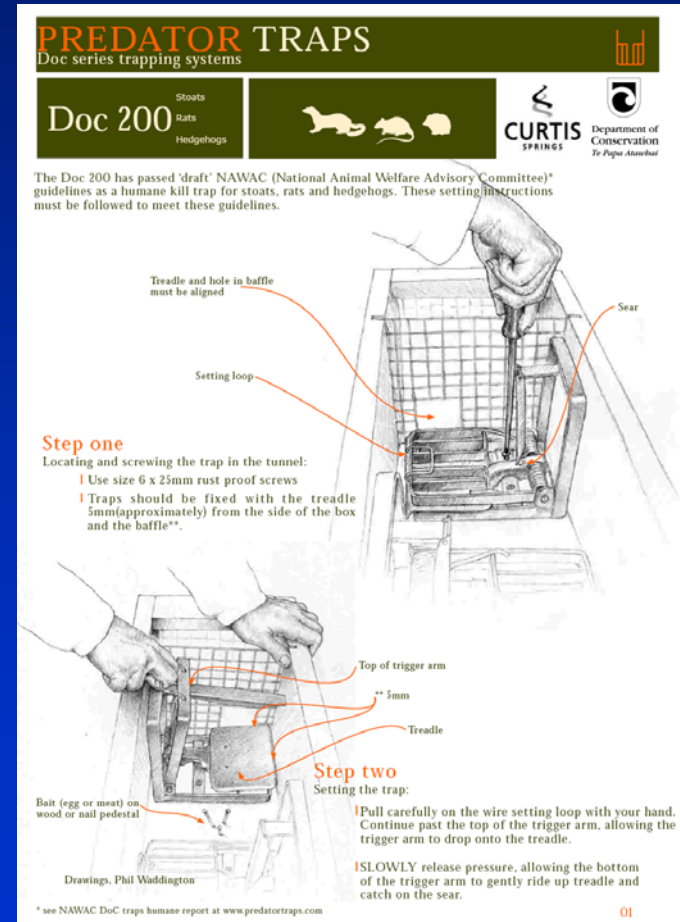
- Stoats can move about in all terrain
 - excellent climbers
 - excellent swimmers
- They are intelligent animals
 - there will always be a few wary individuals in a population



Photo: J. A. Mills

DOC best practice

- Trapping
 - DOC series or Fenns
 - trap lines ~ 800-1000m apart
 - traps ~ 100-200m along lines
- Links to monitoring



Trap line placement

- For stoats (and weasels) trap lines should
 - “...follow habitat perimeter, ridges, tracks, roads, altitudinal contours and waterways”
- For ferrets trap lines should
 - “run along linear landscape features...in isolated patches of cover and other preferred microhabitat, around farm buildings and offal pits...”



Photos: G. Climo



DOC series vs. Fenns

- Fenn Mk IV & Mk VI
 - do not meet NAWAC guidelines
- DOC series
 - meet NAWAC guidelines
 - catch more stoats than Fenns
- Northern Te Urewera trials
 - DOC 200 vs. Fenn Mk VI
 - 173 of each type in single sets
 - Sept 04 – March 2006
 - DOC 200 – 103 stoats
 - Fenn Mk VI – 54 stoats



Photo: D. Merton



Photo: courtesy www.predatortraps.com

Luring traps for stoats

(from Pierce *et.al* 2007)

- Fresh rabbit meat – **BEST**
- Preserved rabbit meat
 - Salted (25% less effective)
 - Freeze dried (56% less effective)
- Pilchards (82% less effective)
- Eggs (85% less effective)



Photo: DOC

Some problems controlling stoats with traps

- Areas being protected are often small relative to the landscape scale over which the stoats operate
- Once local animals are killed reinvasion is usually rapid
- Currently few effective alternatives to trapping
 - secondary poisoning
 - direct poisoning



Photo: I. McFadden

The Future?

- Trained predator dogs
- Fencing
- High tech devices
- Biological control?
 - could be many years away
- Poisoning
 - stoat specific
- Trapping
 - integrate with other techniques
 - better and longer lasting lures



Photo: S. Theobald

Conclusion

- Kill trapping – main option for large scale control
- Know what it is you are trying to protect
- Know the ecology of these pests
- Remember the three P's
 - Patience
 - Perseverance
 - Professionalism



Photo: J. Dowding

FOR MORE INFORMATION

First contact your local Department of Conservation and then if necessary;

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