**Mustela erminea**

**Common name**
Hermelin (German), short-tailed weasel (English, USA), Grosswiesel (German), stoat (English), ermine (English), hermine (French), short-tailed weasel (English), ermine (English, Canada, Eurasia)

**Synonym**

**Similar species**
Mustela nivalis

**Summary**
Mustela erminea (the stoat) is an intelligent, versatile predator specialising in small mammals and birds. It is fearless in attacking animals larger than itself and adapted to surviving periodic shortages by storage of surplus kills. In New Zealand it is responsible for a significant amount of damage to populations of native species.

**Species Description**
The stoat (Mustela erminea) has the typical mustelid shape: a long thin body, a smooth, pointed head, short legs, and five toes on each foot, furred between the pads. The claws are sharp and non-retractile. The ears are short, rounded, and set almost flat into the fur. The eyes are round, black and slightly protruding; the whiskers are very long, and the muzzle is black and dog-like. The body fur is short, normally chestnut brown on the head and back, and white or cream (sometimes shading to yellow or even to apricot) on the underside. The tail is much longer than the extended hind legs, and always tipped with a conspicuous tuft of long black hair, which may be bristled out into a ‘bottlebrush’ at moments of great excitement (taken from King and Murphy, 2005).

**Lifecycle Stages**
Female stoats (Mustela erminea) have extreme juvenile precocity, mated as nestlings but do not produce the young until following season. Males mature at 10-11 months. Limited to a single litter a year, but in optimal conditions it can be large (10-13 young born). Average life span < 12 months in both sexes, because juvenile mortality can be very high, but those that survive their first year survival have a good chance of living 2-3 years.
Uses
Stoats (*Mustela erminea*) have been used to exterminate pest rodents and rabbits on small islands with few alternative prey (King 1989), but only in certain conditions which are hard to meet. Belief that they could control rabbits was the reason for bringing them to New Zealand, but the islands were too large and alternative prey too abundant (King, 2005). Stoats were formerly an important source of white fur (ermine) harvested by trappers in Russia and Canada.

Habitat Description
Stoats (*Mustela erminea*) are found anywhere they can find prey from beaches to above the treeline. They are found in all types of forest, grassland, agricultural land, dunes, scrubland and tundra. They are vulnerable to predation from other mammals and raptors so they tend to stick to cover in open country. In alpine areas stoats may spend most of their time in runs and burrows below the snow, this helps provide insulation against extremes in air temperature. Stoats do not avoid human settlements and can occasionally be seen in villages and suburban gardens (King, 1983; King and Murphy, 2005).

Reproduction
Placental, with 9-10 month compulsory delay in implantation which divides gestation into two, 2-week periods in different calendar years. Ovulation induced by coitus; ovulation rate averages 8-10 every year, range 1-18, but litter size cut down by progressive intra-uterine mortality when food scarce, to zero in extreme conditions (King *et al.* 2003). Stoats of both sexes must survive to about 14 months old to leave surviving offspring.

Nutrition
Stoats (*Mustela erminea*) are specialist predators of small, warm-blooded vertebrates, preferably mammals of the size of rabbits or water voles and smaller. In the native range different rodents are taken at different times of the year (King, 1983). The most frequently eaten prey of stoats in New Zealand are birds, feral house mice, lagomorphs (rabbits and hares, not distinguishable from small remains), rats, possums, and insects (mostly weta of the genera *Hemideina, Hemiandrus* and *Gymnoplectrum*). Minor items include lizards (mostly *Leiolopisma* and *Hoplodactylus*), fish, crayfish (*Paranephrops*), carrion, and rubbish. This general pattern is clear from natural surveys of gut contents backed up by field observations (taken from King and Murphy, 2005).
General Impacts
Introduced to New Zealand later than most other introduced predators (King 1984), after serious damage to native birds had already been done, stoats (Mustela erminea) contributed to the collective toll, especially in more remote areas of South Island (King and Murphy, 2005). M. erminea has been shown to be responsible for catastrophic losses of kiwi chicks in most years (see Apteryx australis; Apteryx haastii; Apteryx mantelli; and Apteryx owenii in IUCN Red List of Threatened Species) (Basse et al. 1999), and of hole-nesting forest birds in southern beech forests during periodic mouse irruptions (O'Donnell 1996). Once kiwi chicks reach a weight of around 800g they are able to defend themselves against stoats (McLennan et al. 2004) so kiwi nurseries have been set up where kiwi chicks are translocated to areas with heavy stoat control until they become large enough to defend themselves against stoats. Cost of research and management of stoats in New Zealand runs into millions of dollars a year.

Management Info
Preventative measures: Risk Assessment models for assessing the risk that exotic vertebrates could establish in Australia have been further explored by the Western Australia Department of Agriculture & Food (DAFWA) to confirm that they reasonably predict public safety, establishment and pest risks across a full range of exotic species and risk levels. The Risk assessment for the Stoat (Mustela erminea), has been assigned a VPC Threat Category of EXTREME.

Mammals and birds were assessed for the pest risk they pose if introduced to Australia, by calculating Vertebrate Pests Committee (VPC) Threat Categories. These categories incorporate risk of establishing populations in the wild, risk of causing public harm, and risk of becoming a pest (eg causing agricultural damage, competing with native fauna, etc). The 7-factor Australian Bird and Mammal Model was used for these assessments.

Trapping is widely used to remove stoats (M. erminea) from game estates in UK and conservation reserves in New Zealand. Trapping is effective when very intense, but is rapidly countered by immigration (McDonald & Harris 2002). Leg-hold traps are still legal for the moment, but likely to be banned in the forseeable future; the first humane trap, the "Fenn", developed in UK in the 1950s, was better but does not meet current standards. New, more humane traps, are being developed. There are no poisons currently registered for use against stoats, but they are often killed by secondary poisoning after operations targetting possums and rats.

Please follow this link to read more on the management of stoats compiled by the ISSG.

Pathway
Mustela erminea were introduced to Terschelling Is. (Netherlands) to control water voles (Arvicola terrestris), which are now extinct on that island (Van Wijngaarden et al. 1961). Mustela erminea were originally transported to rabbit-infested pastures in New Zealand for rabbit control.


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ALIEN RANGE

[1] DENMARK
[1] NETHERLANDS

Red List assessed species 41: CR = 3; EN = 14; VU = 14; NT = 9; DD = 1;

Anarhynchus frontalis VU
Apteryx australis VU
Apteryx mantelli EN
Calaeas cinereus EN
Cyanoramphus auriceps NT
Cyanoramphus novaeseelandiae VU
Diomedea sanfordi EN
Falco novaeseelandiae NT
Hemiphaga novaeseelandiae NT
Hymenolaimus malacorhynchos EN
Larus bulleri EN
Leiopelma pakeka VU
Mohoua ochrocephala EN
Naultinus gemmeus NT
Nestor meridionalis EN
Oligosoma acrinasum NT
Phalacrocorax chalconotus VU
Plectrophenax hyperboreus NT
Porphyrio hochstetteri EN
Puffinus huttoni EN
Xenicus gilviventris VU

BIBLIOGRAPHY

55 references found for Mustela erminea

Management information


Summary: Aliens is the bi-annual newsletter of the IUCN SSC Invasive Species Specialist Group (ISSG). Its role is to put researchers, managers and/or practitioners in contact with each other and to publish information and news of alien invasive species and issues.


Summary: Impacts of stoats on Kiwi in New Zealand.


Christie, J.E., D.J. Brown, I. Westbrooke and E.C. Murphy., 2009. Environmental predictors of stoat (Mustela erminea) and ship rat (Rattus rattus) capture success. DOC Research & Development Series 305. Published by Publishing Team Department of Conservation PO Box 10420, The Terrace Wellington 6143, New Zealand

Summary: Abstract: The association between capture success of stoats (Mustela erminea) and ship rats (Rattus rattus) and landscape-scale environmental predictors was explored using trapping data from three stoat control areas located in podocarp/broadleaved forest in New Zealand. Stoat capture success was higher at trap sites where a rat was also captured at the same trap or a stoat was captured at a neighbouring trap. Drier trap sites with good soil drainage and increased proximity to the operational trapping boundary were also associated with increased stoat capture. Rat capture success was higher at trap sites where a rat had been captured at a neighbouring trap, and at trap sites that were on steeper ground, more easterly facing and within forest habitat. Trap sites with generally poor soil conditions, i.e. sites with lower soil calcium levels and wetter sites with poor drainage, and increasing distance from the forest edge were also associated with increased rat capture. There were highly variable relationships between rat and stoat capture and landscape-scale environmental predictors between the three stoat control areas. This could be due to differing topography, but also to the highly correlated nature of many of the topographic, climate and habitat predictors. Further research specifically designed to separate these effects should focus on the variables identified as common between all stoat control areas in this study. Additional investigations of whether rats captured in double trap sets act as additional bait for stoats would have practical benefits for stoat control areas. The variability of the results emphasises the importance of ensuring that traps are abundant and widespread in stoat control operations.


Dowding, J. E.; Murphy, E. C. 2001: The impact of predation by introduced mammals on endemic shorebirds in New Zealand: a conservation perspective. Biological Conservation 99: 47-64


Gillies, C. and Williams, D. Undated. Using tracking tunnels to monitor rodents and mustelids. Summary: This paper gives detailed information about how to use tracking tunnels.


IUCN/SSC Invasive Species Specialist Group. 2007. Management - stoat


New Zealand Ecological Society


Summary: In depth information about stoats mainly focussing on native range


Summary: A summary of literature available on introduced predators up to 1983. Historical descriptions still useful; management chapter shows how much has changed in 20 years.


Summary: Available from: https://www.oie.int/eng/publicat/rt/2402/PDF/littin767-782.pdf [Accessed 20 March 2007]


Summary: Eradication case study in Turning the tide: the eradication of invasive species.


Summary: This report documents work contributing to a project commissioned by the Invasive Animals Cooperative Research Centre to validate and refine risk assessment models used in decisions to import and manage introduced vertebrate species. The intent of the project was to: a) increase predictive accuracy, scientific validation and adoption of risk assessment models for the import and keeping of exotic vertebrates, and b) reduce the risk of new vertebrate pests establishing introduced populations in Australia.


Summary: Impacts of stoat predation on kiwi.


Summary: Control and management of stoats in New Zealand.


Summary: Status of issues with stoat predation research in New Zealand.


Summary: Impacts of stoats on New Zealand forest birds.

Page, Amanda; Win Kirkpatrick and Marion Massam, July 2008. Stoat (Mustela erminea) risk assessment for Australia. Department of Agriculture and Food, Western Australia.

Summary: Models for assessing the risk that exotic vertebrates could establish in Australia have been developed for mammals, birds (Bomford 2003; Bomford 2006, 2008), reptiles and amphibians (Bomford 2006, 2008; Bomford et al. 2005). These Risk Assessment models have been further explored by Western Australia Department of Agriculture & Food (DAFWA) to confirm that they reasonably predict public safety, establishment and pest risks across a full range of exotic species and risk levels. Mammals and birds were assessed for the pest risk they pose if introduced to Australia, by calculating Vertebrate Pests Committee (VPC) Threat Categories. These categories incorporate risk of establishing populations in the wild, risk of causing public harm, and risk of becoming a pest (eg causing agricultural damage, competing with native fauna, etc). The 7-factor Australian Bird and Mammal Model was used for these assessments.


Tasman District Council (TDC) 2001. Tasman-Nelson Regional Pest Management Strategy


Summary: Notes on introduction of stoats to the island of Terschelling.


Summary: Eradication case study in Turning the tide: the eradication of invasive species.


General information


ITIS (Integrated Taxonomic Information System), 2005. Online Database Mustela erminea

Summary: A comprehensive description of the biology of stoats and weasels. Now out of print, but a new edition was submitted in January 2004 for publication by Cornell University Press, date not yet determined.

Summary: 2nd edition due to be published by Oxford University Press, Melbourne, in 2005.


Summary: A comprehensive description of the biology of stoats and weasels.

