# DOWNLOAD PDF RISK ASSESSMENT OF STOAT CONTROL METHODS FOR NEW ZEALAND

## Chapter 1 : Ferret: animal pest alert | Agriculture and Food

*Optimal application of a pest control method requires the paraphernalia of the technique (e.g. the trap, toxin, bait), its acceptable and safe application (e.g. humane use, environmental safety.*

However, unlike the least weasel, which almost exclusively feeds on small voles , the stoat regularly preys on larger rodent and lagomorph species, and will take down individuals far larger than itself. In Russia, its prey includes rodents and lagomorphs such as European water voles , common hamsters , pikas , and others, which it overpowers in their burrows. Prey species of secondary importance include small birds , fish , and shrews and, more rarely, amphibians , lizards , and insects. Typically, male stoats prey on rabbits more frequently than females do, which depend to a greater extent on smaller rodent species. British stoats rarely kill shrews, rats , squirrels and water voles, though rats may be an important food source locally. In Ireland, shrews and rats are frequently eaten. Hares are sometimes taken, but are usually young specimens. The stoat typically eats about 50 grams 1. Because of their larger size, male stoats are less successful than females in pursuing rodents far into tunnels. The stoat reputedly mesmerises prey such as rabbits by a "dance" sometimes called the weasel war dance , though this behaviour could be linked to Skrjabingylus infections. The stoat may surplus kill when the opportunity arises, though excess prey is usually cached and eaten later to avoid obesity , as overweight stoats tend to be at a disadvantage when pursuing prey into their burrows. Kits produce a fine chirping noise. Adults trill excitedly before mating, and indicate submission through quiet trilling, whining and squealing. When nervous, the stoat hisses, and will intersperse this with sharp barks or shrieks and prolonged screeching when aggressive. In Japan , it is present in central mountains northern and central Japan Alps to northern part of Honshu primarily above 1, m and Hokkaido. Its vertical range is from sea level to 3, m. Stoats in New Zealand Stoats were introduced into New Zealand during the late 19th century to control rabbits and hares, but are now a major threat to native bird populations. The introduction of stoats was opposed by scientists in New Zealand and Britain, including the New Zealand ornithologist Walter Buller. The warnings were ignored and stoats began to be introduced from Britain in the s, resulting in a noticeable decline in bird populations within six years. The highest rates of stoat predation occur after seasonal gluts in southern beechmast beechnuts , which encourage the reproduction of rodents on which stoats also feed, encouraging stoats to increase their own numbers. They are largely resistant to tularemia , but are reputed to suffer from canine distemper in captivity. Symptoms of mange have also been recorded. In continental Europe, 26 flea species are recorded to infest stoats, including Rhadinospylla pentacantha, Megabothris rectangulatus, Orchopeas howardi, Spilopsyllus ciniculus, Ctenophthalamus nobilis, Dasypsyllus gallinulae , Nosopsyllus fasciatus , Leptospylla segnis, Ceratophyllus gallinae, Parapsyllus n. Tick species known to infest stoats are Ixodes canisuga, I. Louse species known to infest stoats include Mysidea picae and Polyplax spinulosa. Mite species known to infest stoats include Neotrombicula autumnalis , Demodex erminae , Eulaelaps stabulans , Gymnolaelaps annectans, Hypoaspis nidicorva, and Listrophorus mustelae. Other nematode species known to infect stoats include Capillaria putorii , Molineus patens and Strongyloides martes. Cestode species known to infect stoats include Taenia tenuicollis , Mesocestoides lineatus and rarely Acanthocephala. Folklore and mythology[ edit ] In Irish mythology , stoats were viewed anthropomorphically as animals with families, which held rituals for their dead. They were also viewed as noxious animals prone to thieving, and their saliva was said to be able to poison a grown man. To encounter a stoat when setting out for a journey was considered bad luck, but one could avert this by greeting the stoat as a neighbour. Similarly, Mary Magdalene was depicted as wearing a white stoat pelt as a sign of her reformed character. One popular European legend had it that a white stoat would die before allowing its pure white coat to be besmirched. When it was being chased by hunters, it would supposedly turn around and give itself up to the hunters rather than risk soiling itself. Fur use[ edit ] Stoat skins are prized by the fur trade, especially in winter coat, and used to trim coats and stoles. The fur from the winter coat is referred to as ermine and is the traditional ancient symbol of the Duchy of Brittany forming

the earliest flag of that nation. There is also a design called ermine inspired by the winter coat of the stoat and painted onto other furs, such as rabbit. Prelates of the Catholic Church still wear ecclesiastical garments featuring ermine a sign of their status equal to that of the nobility. Cecilia Gallerani is depicted holding an ermine in her portrait, Lady with an Ermine , by Leonardo da Vinci. Peacham goes on to preach that men and women should follow the example of the ermine and keep their minds and consciences as pure as the legendary ermine keeps its fur. They could be attached to traditional regalia and cedar bark hats as status symbols, or they were also made into shirts. The Soviet Union also contained the highest grades of stoat pelts, with the best grade North American pelts being comparable only to the 9th grade in the quality criteria of former Soviet stoat standards. However, stoat harvesting never became a specialty in any Soviet republic, with most stoats being captured incidentally in traps or near villages. Stoats in the Soviet Union were captured either with dogs or with box-traps or jaw-traps. Guns were rarely used, as they could damage the pelt.

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## Chapter 2 : Stoat - Wikipedia

*6 Parkes & Murphyâ€"Risk assessment of stoat control methods 1. Introduction Stoats are arguably the worst pest among the suite of introduced predators that threaten native vertebrates in New Zealand (King et al. ).*

Find articles by Grant A. The authors have declared that no competing interests exist. Conceived and designed the experiments: Received Jul 28; Accepted Dec  Abstract Stoats Mustela erminea and ship rats Rattus rattus in New Zealand are targeted by trapping to mitigate their predation on native wildlife. Internationally recognized guidelines for assessing the effectiveness and welfare performance of kill traps are supported by New Zealand legislation under the Animal Welfare Act  We tested a modified version of the trap in â€"12, modified by changing the treadle trigger to a pull trigger and adding a plastic shroud to direct and align approach by animals to the front of the trap. These traps, in vertical and horizontal sets, were tested with both stoats and ship rats. During each test the trap had to render 10 of 10 animals irreversibly unconscious within 3 minutes to meet approval requirements. The modified trap passed with both species in both trap sets. All stoats were struck across the cranium whereas rats were struck either on the cranium or neck. We recommend this trap design for use by community conservation groups for targeting stoats and ship rats in New Zealand. Introduction European stoats Mustela erminea were introduced to New Zealand in the mids to control rabbits Oryctolagus cuniculus [1]. In recent decades conservationists have recognised the threat that stoats pose to endangered wildlife such as kiwi Apteryx spp. Introduced ship rats Rattus rattus are also targeted in New Zealand as a conservation pest, and because both species are of similar size and can be caught by the same trap types, it was considered important to ensure that any trap developed for stoats could also kill ship rats effectively. Although the target species are pests in New Zealand, there is of course concern about the welfare performance of these traps. To assess the welfare performance of a kill trap system including the trap, any boxes or covers used, and the way the trap is set an animal is monitored while approaching and interacting with a trap, and when caught the time to loss of consciousness and cessation of heartbeat is measured. For kill traps to be acceptable, under the NAWAC guidelines, either 10 of 10 or 13 of 15 target animals must be rendered irreversibly unconscious within 3 min of capture. Unconsciousness is determined by using the palpebral blinking reflex, which stops when the animal loses consciousness [12]. The Fenn Mk IV and MkVI traps were tested by Landcare Research in [13] and eight of nine stoats tested failed to be rendered unconscious within the 3 min required. Although these traps met the NAWAC guideline requirements [16] , they are relatively expensive and consequently there is a demand for more economical alternatives. Seven stoats were rendered unconscious rapidly i. The authors concluded that there was insufficient clamping force with this type of trap to hold the animal if they were not rendered unconscious quickly. Although both New Zealand stoats and the Canadian short-tailed weasel are the same species, Canadian animals are generally smaller maximum recorded weight: Our trial with stoats and ship rats built on this knowledge, with a shroud initially based on the Canadian design, used to increase accuracy and consistency of the strike location and the addition of a spring tensioner with the intention of increasing the impact momentum of the trap. Mechanical testing was undertaken to check whether the spring modification changed the impact momentum as intended.

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## Chapter 3 : Stoats | Science

*Risk assessment of stoat control methods for New Zealand We review current and potential stoat control methods to identify where the main constraints and risks on their optimal use lie, and suggest ways to overcome these where possible.*

The Fenn is a relatively humane trap developed in United Kingdom in the s. General Considerations King concluded that stoat control is probably only worthwhile in New Zealand in specific situations, namely during the nesting season and only for the protection of a few endangered bird species that are most adversely affected by stoat predation in Lawrence and O. This extract is edited from King  To plan a mustelid control or monitoring operation, it is necessary to: To operate the chosen plan, it is necessary to: In such locations the cumulative costs of conventional control methods exceeds the initial cost of a fence set up plus maintenance costs in as little as four years. Electric fences may also be used but may be prone to failure Clapperton and Day  Intensive trapping is effective but may be rapidly countered by re-invasion from surrounding areas McDonald and Harris  Control via trapping was attempted in New Zealand to protect the takahe Notornis mantelli. Traps were set in a line at m intervals in Takahe Valley, however, they had little effect on the stoat population, and takahe numbers continued to decline Lavers and Mills , in Dilks et al. Leg-hold traps are still legal in some countries but are likely to be banned. The cost of stoat control is also likely to be prohibitive, however, perimeter trapping layouts may reduce costs. Perimeter tapping around a hectare block has been proven experimentally to be as effective at achieving high stoat catch rates as setting traps in intensive meter-spacing lines Lawrence and O. However, this experiment was conducted in a situation of low stoat density and may not be applied to higher stoat densities. Baits for traps are often based on the food source that is available to the target animal Hamilton  This can be the prey item of highest abundance within an area and can vary from season to season, eg: Other food items such as eggs Dilks et al. In many cases the choice of type of bait is more for ease of operation and the long- life properties of the bait than for its attractant capabilities Hamilton  Locating natal stoat dens using trained dogs and controlling female stoats and young inside by pellet use and sealing of holes is a potentially effective control method which may reduce the summer influx of young stoats into an ecosystem. Theobald and Coad trialled this method in Trounson Kauri Park, New Zealand, to protect newly hatched kiwi chicks. However, the results of this study were not promising possibly as not all entrances were sealed off or the pellets used were not appropriate. The authors also suggest cyanide, diphacinone, zinc phosphide, or MNT. However in a public survey on attitudes toward stoat control Fitzgerald, Fitzgerald and Wilkinson found a lack of support for this method. This was probably due to negative attitudes towards and public debate over the genetic modification of organisms. Despite this animal welfare is an important factor in the selection process for possible biological control options Fitzgerald Wilkinson and Saunders ; Lenghaus et al. McDonald and Lariviere reviewed the literature on the diseases and pathogens of stoats, and closely related mustelids, with a view to identifying potential biological control agents. They found that Aleutian disease virus, mink enteritis virus, and canine distemper virus hold promise as agents of lethal control, though the risks to non-target species posed by these viruses are serious. Host-specific ectoparasites such as Tnchodectes ermineae, nematodes such as Skrjabingylus nasicola, and bacteria such as Hehcobacter mustelae and Bartemella spp could have a role as vectors for the transmission of fertility control agents McDonald and Lariviere  Information Access An international bibliographic database of papers, notes, books and unpublished reports on stoats and two related species Mustela erminea, weasel M. It is also available in a searchable, interactive form on the following Australian based website: It is interesting to note that New Zealand is now the world centre for research on mustelids, especially stoats 8. Integrative Management Stoat control often goes hand in hand with monitoring recovery rates of threatened or native species. Research Research into the use of new baits and lures is substantial a few examples are discussed below. However, primary data is lacking and in the population biology of stoats with the notable exception of

stoat populations in southern beech Nothofagus spp. Understanding the relationships between stoat density and bird survival is needed for the development of novel biotechnological stoat control methods McDonald and Lariviere and, perhaps, to justify such research. After initial data is collated computer simulation modelling may prove a powerful tool in determining the impact of a range of control strategies on stoat populations and the birds they prey on Courchamp and Sugihara , in McDonald and Lariviere More attractive lures and acceptable baits are required to improve the efficacy of stoat control in New Zealand and elsewhere. Apparently traps with bright covers yellow and red are more attractive to stoats than those with duller covers green and black Hamilton A series of preference trials by Robbins and colleagues on captive stoats to determine the potential of various visual, textural, and movement cues in lures and baits found the following: Improved, cost-effective stoat control methods are needed to reduce stoat predation on New Zealand wildlife. Clapperton and colleagues tested the attractiveness and palatability of a range of lures and baits on captive stoats. Prey-based lures were the most attractive. The authors failed to find additional odours that would enhance lure success. These effective baits can be used as alternatives to egg-based baits to increase variety and counter bait- shyness Clapperton et al. The addition of sodium meta-bisulphate to bait produces attractive, palatable baits with a field life of at least one week Clapperton et al. Ethical Considerations Stoats are cute. Many people are horrified at the thought of killing these animals. This poses an ethical dilemma. Sometimes certain values must be compromised in order to preserve other values such as the conservation of the environment. In this case reducing predation by stoats is clearly essential for the survival of several endemic species on the mainland of New Zealand, such as kiwi Apteryx spp. McDonald and Lariviere ; Dilks et al. Some of the trapping methods discussed in the literature are probably far from humane and more research needs to be conducted in this area. For example, kill traps have been assessed against the specifications that target animals must be rendered unconscious within three minutes, and results indicate that most kill traps currently in use fail the test NAWAC , in Warburton and Connor Any planned mink control project should endeavour to gain public support through educational means eg: They should also be based around firm humane guidelines and legal methods of disposing of the animals. This suggests that when weighing up the costs of damage done to the environment by stoats against the costs to stoats of stoat control respondents preferred the options of controlling stoats and were not prepared to allow stoats to remain uncontrolled in New Zealand Fitzgerald, Fitzgerald and Wilkinson Under New Zealand legislation a non-target species must be killed as quickly and humanely as possible. Animals must only be captured and killed in ways that fulfil legal obligations under the Animal Welfare Act New Zealand Ragg and Clapperton For further legislation for pest control in New Zealand, Australia, Europe and the United Kingdom please see Littin and Mellor this document can be downloaded from: Furthermore, before any animal-research projects can proceed eg: This is usually done by assessing the ethical cost to the experimental animals ie: However, it must be noted that this process is often only achieved with vague benefits being provided eg: This can be accessed via a search on Mustela erminea at: This guide is available in two parts Part 1: Planning and Assessing an Operation and Part 2: Field and Workshop Guide , which can be accessed at the aforementioned website or directly by using the websites in reference list below. For more details on the effectiveness of trapping stoats using different bait types, tunnel designs, and trap positions please see Dilks et al. To access an international bibliographic database of stoat information please go to the searchable, interactive Australian based website at: Alternatively, to access a simple reference list go to: For a discussion on the ethics of stoat and other animal control please see Littin and Mellor Strategic Animal Welfare Issues: This may be accessed at: Cost-effectiveness of exclusion fencing for stoat and other pest control compared with conventional control, Department of Conservation Science Internal Series T and Wickstrom, M. Vertebrate Pesticide Toxicology Manual Poisons: Monitoring and Control of Mustelids on Conservation Lands: Trap Spacing and Layout: Strategic Animal Welfare Issues: Diseases and Pathogens of Mustela spp. Animal Health Board, Wellington. Research on Vertebrate Pesticides and Traps: Do Wild Animals Benefit?

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## Chapter 4 : Stoat - ISSG | calendrierdelascience.com

*@MISC{Parkes_risk, author = {John Parkes and Elaine Murphy}, title = { Risk assessment of stoat control methods for New Zealand. Science for Conservation Department of Conservation}, year = {}} Science for Conservation is a scientific monograph series presenting research funded by New.*

Show Context Citation Context Efforts to reduce all three of these species together resulted in successful control of the rats and possums, but not the stoats. With the exotic prey species much reduced, the Risk assessment of stoat control methods for New Zealand. Science for Conservation  Manuscripts are internally and externally peer-reviewed; resulting publications are considered part of the formal international scientific literature. Individual copies are printed, and are also available from the departmental website in pdf form. In this paper, we revisit the dynamical interaction among prey bird , mesopredator rat , and superpredator cat discussed in [Courchamp, F. Journal of Animal Ecology 68, â€"]. First, we develop a preyâ€"mesopredatorâ€"superpredator i. Our BRC model overcomes several model construction problems in Courchamp et al. We explore the possible control strategies to save or restore the bird by controlling or eliminating the rat or the cat when the bird is endangered. We establish the existence of two types ofmesopredator release phenomena: Asharpsufficient criterion is established for the occurrence of severe mesopredator release. We also show that, in a preyâ€"mesopredatorâ€"superpredator trophic food web, eradication of introduced Population biology of small mammals in Pureora Forest Park: The feral house mouse Mus musculus by C. Populations of four species of carnivores were sampled over the five years at Pureora Forest Park, by regular three-monthly Fenn trap index lines supplemented with occasional control campaigns by shooting and additional traps. Stoats were the most frequently collected 63 captures , Stoats were the most frequently collected 63 captures , followed by weasels 18 , cats 15 and ferrets  Stoats ranged throughout the mosaic of forest types but especially the older exotic blocks, hunting rabbits, rats, possums and birds. The mean age of 55 stoats trapped was 15 months, and their maximum life span about 5 years. The age-specific mortality rate of first year stoats was about 0. Cats and ferrets hunted the native forest blocks where their main prey, rats and possums, were abundant. The body sizes and reproductive patterns of mustelids at Pureora were similar to those recorded in podocarp-broadleaf forests elsewhere in New Zealand. Of the three mustelids at Pureora, stoats had eaten proportionately the most birds, but even they might do less damage to the local bird populations than the vastly more abundant ship rats and poss Five-minute bird counts were made on Rangitoto Island in and , 8 and 9 years after the start, and 1 and 2 years after the completion of a 7-year programme that resulted in eradication of the introduced brushtail possum Trichosurus vulpecula and brushtailed rock wallaby Petrogal Five-minute bird counts were made on Rangitoto Island in and , 8 and 9 years after the start, and 1 and 2 years after the completion of a 7-year programme that resulted in eradication of the introduced brushtail possum Trichosurus vulpecula and brushtailed rock wallaby Petrogale penicillata. These were compared with counts made in immediately before the start of the programme , to assess whether bird species diversity and abundance had increased as a result of the eradications. Silvereye and tui counts increased significantly. This is most likely a response to increased flowering of pohutukawa Metrosideros excelsa and rewarewa Knightia excelsa as a result of possum and wallaby eradication. The most likely reason for no apparent increase in the abundance of other bird species is the continued presence of predators, especially ship rats Rattus rattus , cats Felis catus , and stoats Mustela erminea. The concurrent eradication of all vertebrate pests, and a reduction of commerci

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## Chapter 5 : Risk assessment of stoat control methods for New Zealand - PestSmart Connect

*Risk assessment of stoat control methods for New Zealand "The toxins currently used in New Zealand are only registered for the target pest, generally possums, so the deliberate use of them to target stoats is illegal.*

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. 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. 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 months. Limited to a single litter a year, but in optimal conditions it can be large young born. Uses Stoats Mustela erminea have been used to exterminate pest rodents and rabbits on small islands with few alternative prey King , 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, 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 settlemernts and can occasionally be seen in villages and suburban gardens King, ; King and Murphy, Reproduction Placental, with month compulsory delay in implantation which divides gestation into two, 2-week periods in different calendar years. Ovulation induced by coitus; ovulation rate averages every year, range , but litter size cut down by progressive intra-uterine mortality when food scarce, to zero in extreme conditions King et al. 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, 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, 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. Mustela erminea were originally transported to rabbit-infested pastures in New Zealand for rabbit control. The natural history of weasels and stoats; King, C. Oxford University Press, Auckland. Global Invasive Species Database Species profile: General Impacts Introduced to New Zealand later than most other introduced predators King , 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, Once kiwi chicks reach a weight of around g they are able to defend themselves against stoats McLennan et al. Cost of research and management of stoats in New Zealand runs into millions of dollars a year. Management Info Preventative measures: 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. 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.

## Chapter 6 : usage in New Zealand - Wikipedia

*Stoats are significant predators of New Zealand wildlife. The main method of stoat control at present is trapping, using fresh hen eggs as a lure. Eggs and other food- based lures often become.*

It is also used on a smaller scale for pest control by Regional Councils and private landowners. The first trials were carried out in New Zealand in , and by its use had become widespread. Consequently, the native birds, insects, and flora have developed no natural defence mechanisms against introduced animals such as possums , rats , mustelids and feral cats. Populations of the reptile tuatara have also been severely impacted. These successful knock-down rates provide vulnerable native birds with a crucial breeding window to raise chicks through to fledging, increasing their survival rate. The organisation responsible for managing bovine TB in New Zealandâ€"the Animal Health Board â€"uses poison as one of a range [20] of pesticides to kill possums and control the spread of disease to both livestock and unaffected areas of the country. Aerial application of poison is only used in places where ground control methods are impractical or unable to knock possum numbers down to a low enough level to break the disease cycle. The combination of aerial spreading and the use of carrots poisoned with enabled rabbit boards which were responsible for rabbit destruction work to reduce rabbit numbers in most areas by the early s. In general, the majority of conservationists and livestock farmers support the continued use of for pest control, while the hunting community, animal rights groups and antifluoride campaigners support a ban, but there are exceptions on both sides. The review gave new guidelines for the use of the pesticide in New Zealand, and concluded the beneficial effects of pest eradication outweigh the risks. It is seen as an effective poison for aerial spreading. The PCE came to a number of conclusions, including not having a moratorium on use, and setting up a Game Animal Council. An investigation revealed that Anderton lied to journalists and the public. Sign on display at supermarket after it was revealed that an individual had threatened to poison products with In , the New Zealand Police revealed that anonymous blackmail threats were sent to Fonterra and Federated Farmers saying that infant formula in supermarkets would be poisoned unless the use of was halted by the end of the month. Support[ edit ] The following agencies, organisations, and political parties support the use of in New Zealand: The Royal New Zealand SPCA wants an immediate plan to find a more humane alternative to the use of poison and believes "inflicts terrible, prolonged suffering on the animals that it poisons" [56] The New Zealand Deerstalkers Association , which promotes the interests of hunters in New Zealand, have reiterated their national policy of opposing poisoning in the face of the Parliamentary Commission report advocating its increased use. Can the method increase populations of native species? Can the method rapidly knock down erupting populations of pests? Can the method be used on a large scale in remote areas? Is the method sufficiently cost-effective? Does the method leave residues in the environment? Can by-kill from the method be minimised? Does the method endanger people? Does the method kill humanely? Pindone, diphacinone, and coumatetralyl[ edit ] Pindone , diphacinone , and coumatetralyl are the first-generation anticoagulants most commonly used for pest control. They are generally very effective at controlling rats to keep their numbers low, but cannot effectively deal with sudden population surges. Anticoagulants break down very slowly in water and soil. They also accumulate in the liver tissue of live animals that have been exposed to the poison either by eating bait or feeding on an animal that has eaten bait and in carcasses. They are also the most inhumane of the poisons currently used. Brodifacoum[ edit ] Brodifacoum is a second-generation anticoagulant. It is licensed for killing possums and rats. Like , it will kill stoats that feed on poisoned animals. Brodifacoum takes a very long time to break down in soil and water and accumulates in the tissue of exposed animals for years. It is a highly lethal, broad-spectrum poison that depletes cells of energy, quickly resulting in respiratory arrest and death. While there are antidotes to cyanide poisoning, their effectiveness is controversial and the rapid action of the poison limits the time in which they can be used. It was developed as a poison to control rats and mice in the s. It works by leaching calcium from the bones of the poisoned animal into its bloodstream, leading to organ

failure. It breaks down readily in the environment and the risk of by-kill is considered to be low. Cholecalciferol is more expensive to produce than  Some promising results have been obtained by combining cholecalciferol with other substances, such as aspirin, to make it more cost-effective and faster acting. PAPP kills stoats directly, but not possums and rats. It is approved for use in paste form or in fresh minced meat, so will only provide effective stoat control as part of intensive ground control. The risk of by-kill is likely to be low since it does not leave residues in the environment. Zinc phosphide[ edit ] Zinc phosphide microencapsulated zinc phosphide paste has been widely used overseas for decades, predominantly to control rats and mice on agricultural land. It causes death by heart or respiratory failure. It will be used as an additional vertebrate poison in certain situations. Unlike , it cannot be used for aerial application. It kills in a similar way as PAPP, by reducing the ability of red blood cells to carry oxygen methemoglobinemia. Sodium nitrite is expected to be registered for use in for killing possums, but not rats. It will not control stoats because it will not knock down rat populations or bioaccumulate in poisoned animals. It does not leave residues in the environment and the risk of by-kill is expected to be low. It is much more humane than  Possums, rats, and stoats can all be killed with traps. However, an intensive ground operation will typically involve trapping possums and stoats, but poisoning rats because there are so many more of them. In a mass event, populations of rodents rapidly increase as much as ten-fold, and traps simply cannot be deployed rapidly enough or in sufficient numbers to knock them down. Some terrain is too rugged or dangerous for trapping, and trapping is not practical on a large scale. In one day, a single trapper can check traps on tens of hectares, whereas an aerial drop can cover tens of thousands of hectares. Traps need to be checked and reset regularly, which makes them labour-intensive. Self-resetting traps, such as the Goodnature trap, [81] are being developed and trialled, and could in the future significantly reduce labour costs and increase the cost-effectiveness of ground control operations. Twenty three species of native birds have been reported as having been killed by leg-hold traps, [82] and many kiwi have suffered leg or beak damage. Most of the methods proposed involved some form of genetic engineering , and if developed further would attract a great deal of public opposition. No biological control method has therefore yet gained widespread acceptance as a viable alternative to

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## Chapter 7 : Risk identification, assessment and management | Education in New Zealand

*Developing a new toxin for potential control of feral cats, stoats and wild dogs in New Zealand Risk assessment. of stoat control methods for New Zealand. Science.*

John used a whiteboard to list the three most important predators of our native bird species and he wrote them up on the board in the following order of importance: Since then rat populations have increased rapidly. This increase may have serious consequences not only for native species preyed on by rats but also for native species threatened by stoats or cats as both these predators may increase when rats a major element in their diet are very abundant. It appears that he managed to pry the screwed down lid off the trap to gain access. A warning has been sent out to other trapping groups in kea habitat to check their lids are secured firmly. If both nests are successful, it will be the first time that more than one nest per year has avoided predation. A stoat is caught on the scout camera outside Hows nest and 2 chicks remaining in Queen Powpows nest from and original 3 chicks. The presentationâ€¦highlighted the likely effect of introducing bird repellents to reduce mortality of kea during aerial poison drops to control stoats, possums and rat populationsâ€¦this was the research that was most clearly identified to have an impact on practice. The increase in mice may counter this to some degree if stoats switch to mice as their main prey item. In the short term resident stoats will die from feeding on dead possums and rats but this benefit will not be sustained, as stoats will rapidly re-invade the area. We see yellow-crowed kakariki feeding on beech forest seeds and flowers all around the lodge. It covered 30, ha, including the South Okarito kiwi sanctuary, North Okarito forest, and a large forested buffer zone around Franz Josef township. Repeated aerial poisonings of rats are likely to become less effective. Stoat numbers are not likely to be reduced by aerial for any significant amount of time. Rats and stoats need continuous, rather than pulsed control and a variety of control techniques. The extensive network of tracks and dots representing traps enabling this operation can be seen on the map we usedâ€¦. The results from the rodent lines in March show that there has been a huge increase in rat abundance between March 3. This correlates with our casual observations from the stoat trapping program which have indicated a much higher rat trapping rate than previously. When mouse numbers crash, stoat numbers also decline, with the small number of remaining stoats in the Murchison Mountains apparently relying primarily on ground weta for their survival. Such exploratory behaviour is likely to expose both livestock species and presumably also wild deer to infection. It is likely that possums are also an important source of infection for ferrets, feral cats, stoats, hedgehogs, feral pigs, and other possums, which have all been recorded scavenging the carcasses of infected possums. Studholme Ship rat Rattus rattus irruptions in South Island beech Nothofagus forest In a remnant population of mohua yellowhead was discovered in silver beech Nothofagus menziesii forest on Mt Stokes in the Marlborough Sounds. Over recent years, intensive pest control has been carried out on the mountain for possums, stoats, weasels, goats and pigsâ€¦However, over the winter of , more than half of these birds went missing. Reduced predation pressure and an increased food supply, coupled with a mild winter, may have contributed to increased ship rat numbers on the mountain. There are some examples where ship rat numbers do not increase after beech seedfall. A partial mast in the Dart and Caples Valleys last autumn did not result in high rat numbersâ€¦King recorded an increase in rat numbers in the Hollyford and Eglinton valleys after seed fall in but found no increase after a beech mast in  However, in conjunction with other factors, i. At the end of the summer there were around 90 birds, but now numbers are estimated at 27, of which only 6 are female. Predation by ship rats is thought to be the cause of the sudden declineâ€¦ Intensive trapping of stoats had been sufficient to protect the birds because rats had almost never been recorded at this altitude on Mt Stokes. It could be suggested that stoat trapping be initiated only following beech mast years, but for kaka, at least, stoat control would need to occur during the previous summer when beech flowering initiates widespread breedingâ€¦To keep the stoat population at a low level with a low density of traps probably requires continual trapping. Further work is needed here on rat population dynamics in beech forests to determine whether lack

of predators means a larger irruption in mast years or if climate is the major influence. Over the five summers that the lines have been operated the number of stoats caught tallied 13, 6, 12, 5, and 12 respectively. Because of the extremely heavy beech seedfall of the preceding autumn and the predicted consequent mouse and stoat plague, a further three trap lines were installed in and about an area with a particularly high Mohua population. These lines were operated over November and December only and accounted for 11 stoats in 13, Given that the mouse index trapping undertaken in November resulted in a fold increase in numbers caught compared with any of the preceding 5 years, the lack of a significant increase in the number of stoats caught was somewhat unexpected. A breakthrough in stoat control developed by NTUERP may have been achieved using freeze-dried rats as a lure to trap stoats. When placed under a plastic cover these rats have remained effective in trapping stoats for up to 6 weeks under field conditions. Two hundred and eighty tunnels each containing two Fenn traps were set along 42 km of lines on ridges, spurs and streams covering ha. The tunnels were alternately lured with a freeze-dried rat and plastic egg which, along with hen eggs, are currently the best longlasting stoat lure in one tunnel, followed by a plastic egg in the next. Over a 3- month period 57 stoats were caught. Two of the three videoed nests have been visited by stoats and one also by a possum. A stoat destroyed one of the nests and the female survived, while the other female managed to defend her nest from a stoat and a possum although the stoat stole one egg. A third female was thought to have just begun incubating when she was killed, she was found pulled under a rock with stoat scats surrounding her. Rat captures in the Makarora and Dart Valleys are up on previous years, and rodents now appear to be a permanent feature of these permanent trap lines. Also, in the Dart stoat numbers are increasing as a result of the mast event last spring. This is the third season in a row for high stoat numbers in the Dart. Numbers increased spectacularly with stoat control over the past 10 years, but an unprecedented irruption of ship rats during the winter of spelt their doom. Recently numbers are dropping off, and the rate of rat captures is increasing slightly. Dowding Ecology of the stoat in Nothofagus forest: Following seedfall, mouse density rises dramatically, followed by a sharp rise in stoat numbers. It has been suggested that mice feed on the abundant seed and that stoats in turn increase because of the large numbers of mice available to them. We suggest that the situation is more complex and that increases in not only mouse, but also bird and possibly invertebrate densities may contribute to the high productivity of stoats in the year following a Nothofagus seedfall. Clearing stoats from sensitive areas and even from large buffer zones around them as well is only an effective strategy while trapping is continued; stoats may re-invade within a few weeks after trapping stoats. Mouse and stoat numbers can rise after poor mast yearsâ€¦so assessing potential impacts on threatened species may require a better predictor than heavy beech seeding alone. And stoats Mustela erminea. I have found no evidence of these animals affecting Keas. Twice I have found a dead possum Trichosaurus vulpecula within five yards of a Kea nest. The opossum frequently chooses holes similar to a kea nest as a den and perhaps these two opossums prospected the Kea nests.

DOWNLOAD PDF RISK ASSESSMENT OF STOAT CONTROL METHODS FOR NEW ZEALAND

## Chapter 8 : Mustela erminea (ermine)

*Stoat Control Methods A Survey of. to support the development of biological control methods for stoats, including methods. of the researchâ€"a questionnaire survey of the New Zealand public. ? Feasibility of.*

Thursday, 3 May - Transmission of the disease bovine tuberculosis Tb to domestic stock is a serious threat to agriculture in New Zealand. The ferret is a Tb carrier and can infect stock through direct contact. The environment can also be contaminated with Tb-infected ferret faeces and urine that stock come into contact with while grazing. The ferret is considered a moderate environmental pest, particularly in New Zealand, where vulnerable birds such as the weka, kiwi, kakapo, kea and laughing owl now extinct all declined in numbers after the ferret became established in the wild. Populations of black stilt and royal albatross both endangered were also adversely affected when their chicks were killed by the ferret. The ferret can inflict painful bites on people and cause injury requiring medical treatment. Infants and small children are particularly at risk from facial bites. Control programs are carried out in New Zealand to reduce populations of the ferret, and its destructive relatives the stoat and weasel. A variety of methods are used including trapping with a range of trap types, baits and detector dogs. Biological control methods are also being investigated for use in the future. Potential to be a pest in Australia The ferret is rated as being highly likely to establish wild populations in Australia and become a pest of agriculture, the environment and public amenity. It is therefore important that ferrets do not establish in the wild in Australia and that new genetic stock from overseas is not permitted to enter the country. The ferret has the potential to establish small populations in the wild here that could go undetected for decades before increasing rapidly when favourable conditions occur. Successful populations could arise if any adaptation to current environmental conditions occurred, or as a result of the arrival of new genetic stock that allowed ferrets to thrive under a wider range of conditions in the wild. The ferret is an aggressive predator that could threaten biodiversity in Australia, with a wide range of Australian native birds, mammals, marsupials, reptiles and frogs potentially at risk. Ground-nesting birds could be under threat from direct predation on their eggs and chicks, while small marsupials could be ideal prey. The ferret could also affect backyard and commercial poultry production by taking chickens and eggs. Ferrets in the wild Many ferrets are kept as pets in Australia and although many owners keep them leashed to avoid escape when the animals are outside their cages or on excursions, accidental release can occur. Some ferrets are still used to hunt rabbits, a practice that results in their escape into the wild. Unwanted ferrets are also intentionally released by irresponsible owners. Ferrets make demanding pets. They must be kept indoors or in escape-proof enclosures, have a strong odour particularly unsterilized males and can give painful bites. They also have little monetary value because they are commonly available. All these factors may contribute to ferrets escaping or being released into the wild, with some states and territories carrying out control programs to remove them. Some ferret societies in Australia offer a rescue service for unwanted or dumped ferrets and advocate responsible ownership. Ferrets have occasionally been recorded in the wild in Western Australia and there are unconfirmed reports they are present on King Island in Bass Strait. In Tasmania some survey work has been carried out at South Arm coastal, outer suburban Hobart. This is because authorities have received many reports of ferrets at large in that area, as well as from the south-east of the state generally. However, there are currently no confirmed, successfully established ferret populations in the wild in Australia. Risk management It is illegal to keep or import ferrets into the Northern Territory and Queensland, and a permit is required to keep ferrets in Victoria and the Australian Capital Territory. Ferrets are permitted in the other states, although in Tasmania and Western Australia it is an offence to release ferrets into the wild. To help prevent ferrets from establishing in the wild and becoming pests in Australia, it is essential that captive animals are maintained in secure enclosures. Unwanted ferrets should be surrendered to a responsible organisation, not released. Any ferrets seen in the wild should be reported to the nearest relevant government department or wildlife authority so that appropriate action can be undertaken. Use the links on this page to reach ferrets in WAOL.