Tupou Zone Pest Management Plan (PMP)

Version 2025

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1. INTRODUCTION

This Pest Management Plan (PMP) is a component of the overarching Tupou Zone Reforestation and Biodiversity Management Plan (RBMP). It provides a detailed framework for the control of introduced animal and plant pests, which is the most important action for enhancing and sustaining native fauna, allowing natural regeneration and protecting native plantings in the Tupou Zone.

The plan is designed to align with the conservation objectives of the site and relevant national and regional pest management strategies. The plan is adaptive and responds to monitoring results, weather, and pest sightings.

The aim is to move as close as possible to pest eradication and coordinate control, where possible, with surrounding properties to intercept pests before they can get to the Tupou Zone.

2. OBJECTIVES, METHODS, TIMING, MEASURES AND RESPONSIBILITIES

Objectives

The primary objectives of the PMP are to:

- Suppress Pest Populations: Maintain pest animal populations (pigs, possums, rats, cats, hedgehogs, rabbits, hares and mustelids) at very low levels across the entire property. The specific target for rats and stoats is a tracking tunnel index of below 5%.
- Protect Native Flora and Fauna: Prevent damage to existing native forest remnants and new plantings, and enable the successful breeding and survival of native birds, lizards, and other species;
- Control Invasive Weeds: Systematically manage and control key plant pests, with a primary focus on pampas, moth plant, wild ginger, and other invasive species, to prevent their spread and impact on native vegetation.

Methods and Timing

A multi-faceted approach to pest control is implemented across the Tupou Zone.

Animal Pest Control

- Bait Stations: A grid of bait stations is established over a grid across the property, baited and maintained regularly.
- Trapping: A variety of industry-standard, humane traps are used and are strategically placed to target specific pests. Traps are checked fortnightly (monthly in late autumn and winter).

- Night Shooting: Thermal scopes are used by farm managers for targeted night shooting of pests, particularly pigs and cats. This is also used to provide bait for stoat trapping.
- Timing: Pest control is an ongoing, year-round activity to ensure continuous suppression of pest numbers.

Weed Pest Control:

- Methodology: The property has a low weed burden, with the exception of pampas. Control methods will focus on targeted spraying and removal of pampas and other invasive species as they are identified. A priority list of other key weeds (e.g., moth plant, tobacco weed, bone seed, wild gladioli) will be proactively monitored and removed.
- Timing: Weed control is undertaken as required, with an initial focus on pre- and post-planting periods.

Fencing:

- Methodology: Existing fenced areas will be maintained to exclude livestock. Additional fencing of wetlands in farmed areas is planned to protect water quality and provide improved habitat for native fish and birds. New plantings may benefit from rabbit-proof fencing, especially on sandy soils.
- Timing: Fencing of wetlands and new plantings will be undertaken as part of the wider habitat creation and improvement programme.

Measures and Responsibilities

Measures: The success of pest control is measured through pest surveys using chew cards and tracking tunnels, with a target of a tracking tunnel index below 5% for rats and stoats. Fauna counts for birds and lizards, as well as forest health indicators (flowering, fruiting), also serve as key measures of success.

Responsibility: A dedicated pest control coordinator oversees the programme on the retired land, while farm staff manage pest control in areas where livestock remain. This ensures comprehensive coverage across the entire property.

3. DETAILS ON TRAPPING, BAITING, AND SAFETY PROTOCOLS

Trapping and Baiting: Traps and bait stations are regularly checked and maintained. Bait is chosen based on its target-specificity to minimise risk to non-target species, and a diversity of traps is used to reduce trap shyness.

Specific Methodologies for Pest Types:

- Predator Control (Rats, Stoats, Weasels, Cats): A combination of baiting and trapping is used. Specific traps like Steve Allen, Conni's, and live capture traps are deployed for cats. A dense network of traps at 200m spacing is used for stoats and weasels.
- Pulsed Poisoning: Poisoning is pulsed rather than constant to prevent bait shyness. A range of different poisons are rotated.

Safety Protocols

- Public Safety: All bait stations and traps are clearly signed. Neighbours will be informed prior to any controlled substance operations.
- Non-target Species: The selection of specific bait types and trapping methods is a crucial safety measure to protect native fauna, including kiwi. Staff are trained to recognise and respond to any non-target interactions, and a protocol is in place for reporting and investigating such incidents.
- Chemical Handling: Controlled substances require a CSL (Controlled Substance Licence), and all necessary PPE must be used. Antidotes for cyanide must be available.

4. LONG-TERM MAINTENANCE AND FUNDING

Funding: The programme is funded by the owners of the Tupou Zone.

Maintenance: The pest control coordinator and farm staff are permanently dedicated to the ongoing management and maintenance of the pest control infrastructure.

5. REVIEW AND ADAPTIVE MANAGEMENT

The PMP is a dynamic document that will be formally reviewed at least every five years. The results from pest monitoring, ecological surveys, and feedback will inform any necessary changes to pest control methodologies, baiting, or trapping locations to ensure the most effective and efficient outcomes. Any changes will be made to ensure consistency with the Tupou Zone's objectives and with any new national or regional pest management plans.

ATTACHMENT A - Tupou Pest Control Details

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There is an inherited problem

All free ranging introduced mammals are a problem pest to native fauna and flora in Aotearoa/New Zealand. The aim at Tupou is to move as close as possible to eradication plus coordination of control with surrounding properties. The latter is to intercept pests before they can get to Tupou.

Planning must be adaptive and respond to monitoring results, weather and sightings. Traps should be checked fortnighly whereas poisoning should be pulsed. Possums can be near elimination whereas rats should be reduced to minimal levels especially at the start of winter. Once they increase in spring, consideration should be given to a secondary poisoning operation. This is to protect the influx of young birds especially.

Rabbits

These are an ongoing problem that is unlikely to be near eradication on Tupou. Poisoning is difficult as rabbits are very selective on what they eat. A number of boxes have been constructed to administer poison and this should be used especially when grass growth is minimal.

Night shooting is very effective and provides bait for stoat trapping. This should be used regularly using the night vision recently purchased for the farm managers.

When burrows are found, these should be gassed with magtoxin.

New plantings benefit from rabbit proof fencing and wrapping of trees and this should be considered especially in on sandy soils.

Hares

These are in smaller numbers than rabbits but are an ongoing problem. Night shooting is the most successful control mechanism.

Possums and rats

Objective to ensure bait is always available for rats and possums when they are present.

1. The most effective tool is laying bait in grid stations
2. Ensure all bait lines are full when doing an operation by monitoring fortnightly and replacing where required as determined by monitoring or high bait take.

3. Replace broken bait stations and grills
4. Ensure bait stations at correct height and move if not. Think like a rat!
5. Rotate bait used as required and avoid constant baiting to minimise bait shyness.
6. Assist in monitoring effectiveness of baiting with tracking tunnels

Rats and mice are very fast breeders and can rapidly recover from a poison operation. Once every second year(see below) an operation to kill rats that then act as carriers for secondary poisoning of stoats, weasels and cats is required. Rat numbers should be allowed to build to 20 – 30% tracking to allow this secondary poisoning to occur. This means that rat poisons should be held for two months prior to the larger operation. A second operation is also done at least once yearly which isn't a secondary operation. Further operations are done where required in areas of high rat density.

There are two species of rat – Norway rats which are water rats and do not climb; and ship rats that are excellent climbers. Bait stations for Norway rats should be at ground level around wetlands and lakes. Bait stations for ship rats are everywhere else. Mice will tend to be supressed by rats.

Possums are slow breeders and can easily be reduced to very low levels and maintained that way. Young possum disperse in autumn and to a lesser extent in spring and poisoning should target those times especially. Cyanide in strikers is the best option for controlling possum where rat numbers are low.

Stoats, weasels and cats

These pests are predators that are capable of killing multiple prey in the same night. They can be targeted through secondary poisoning but are difficult to poison directly so they require a network of kill traps. Predator traps are statically placed in areas of preference throughout the property to catch these and a range of different trap types are used to reduce trap shyness.

Cats

Steve Allen's, Conni's and live capture traps are the best traps that all need frequent rebaiting. Cats will not visit old bait and are best caught with fresh fish or meat. Steve Allen traps also kill possum if baited with a lure.

Cats roam large distances so SA traps can be up to 500m apart however is better to have them closer like on Tupou for a higher catch chance.

Stoats and Weasels

Stoats can also roam large distances but because they are more common, a network of traps at 200m spacing is beneficial. Stoats run through pipes, cross bridges and avoid large open spaces so trap placement is key to success. Bait or lure is also important and needs to be changed both for variety and weather. Fresh and salted rabbit is good but does not last in wet weather when eggs should be used. Trialling different bait types is also good to help encourage those more difficult animals into the traps.

Traps should be set and cleared fortnightly except in late autumn and winter when once monthly is more appropriate.

Some animals become trap shy and hence it is important to use secondary poisoning at least once every two years. Autumn and late spring are likely best as they coincide with movement of juvenile mammals and breeding/fledging of birds.

Poisons

All poisons should be placed in bait stations, and none openly broadcast. Ideally they should be preceded by prefeed and then removed 3 weeks after being put out.

For rats and possum, **Double Tap** and cholecalciferol is effective.

For rats and mice ratabait paste or diphacinone is effective

Pest Off is **brodifacoum** and is very effective both for direct kills or rats and possums (and even rabbits) and for secondary poisoning. Unfortunately, it is long lasting in the environment and hence should only be used infrequently – such as every 3 years.

Pindone is the least effective as animals must eat large quantities to die.

Kiwisaver / sodium fluroacetate / 1080 is a very effective natural poison that rapidly breaks down in the environment. It is also very cheap and is ideal for secondary poisoning. It is lethal to dogs so neighbours should be informed. Injecting 1080 into fresh meat baits is a new option that is worth trialling.

Monitoring

Assessing the level of pest numbers and the effectiveness of poison runs is a useful tool for assisting planning. Tracking tunnels are ideal as they provide records of both predators and prey. Random lines that cross different ecosystem types is useful. Trail cameras are also an effective monitoring tool.

Weeds

Tupou is remarkably free of weeds although some areas have considerable infestation.

The most important weeds are moth plant, pampas, tobacco weed, bone seed and wild gladioli. These are being removed at all sites as they are found. Seeds are bagged and sent to external refuse depots.

Pampas had been planted as an emergency winter feed for cattle and was also rampant around the estuary behind the houses. Large areas have already been sprayed and continual action on plants on cliff faces continues

Norfolk Pines that had been in large numbers around the houses have been eliminated.

Eradication plans will be developed for other invasive weeds should they be found.

APPENDIX:

Poison guide: step by step

The importance of pre operation monitoring-

Prior to starting a toxin operation, it is important to establish a base line of abundance of pest species so change can be demonstrated after operation.

All decisions made around what type of toxin to use, when to use it, and the amount needed should be based off results from monitoring via chew cards or tracking tunnels. Results also show where to put out more or less poison to be the most effective. Chew cards should be placed in lines consisting of 10 cards spaced at 50m intervals, lines should be spaced 100m apart. This is the same for tracking tunnels however tracking tunnels do not show possum density so using a combination of monitoring techniques is best. This is DOC standard and results from these are what are needed for decision making.

What type of toxin to use?

This decision needs to be made based of the results from monitoring. For example, there is no point laying a toxin which is targeted at rats when the area has a high possum density.

For the first operation in an area or one after a long period of time, then it is likely monitoring will show high density. In this case the use of a high strength bait is best where only a small amount is needed for a lethal dose to do an initial knock back. For this sodium fluoroacetate will be best as it is a generalized bait which cover all pest species with a secondary effect which will also knock back stoats, cats, and other predators. However, in some cases the use of these toxins is not possible. In that situation, a toxin like Double Tap should be used (see poison list) to reduce initial high numbers, then, if necessary, follow up with Pest Off/Brodifacoum. Brodifacoum can be residual in the environment but provides a secondary kill so the less used the better

Areas with possums as indicated by chew cards - cyanide, in the form of Ferotox strikers can be used when possums are at higher densities. Use of cyanide requires a CSL, and rat numbers need to be low otherwise baits will be eaten by rats which swallow the cyanide capsules in feratox whole and are unaffected. So, in most cases where there are both possums and rats, the best poison to use is cholecalciferol. Pre feeding is important with most toxin work and this must be done with cholecalciferol.

Areas showing high rat density where possums are absent or down to low numbers, the best option is diphacinone. This is extremely effective on rats and highly palatable, it also doesn't require pre feeding.

It is NOT worth wasting time using toxins that require a high intake of bait to obtain a lethal dose. For example, pindone is not a toxin that should be used for the control of possums and rats. This is because it takes approximately 500 grams to be ingested by each possum before they obtain a lethal dose. Not only does this increase the chance of an animal becoming bait shy but it means it requires lots of feed to be put out multiple times which is costly. Pindone is also very residual in the environment so this in combination with the large amounts needed to have an effect mean that it is not worth using.

Importance of bait rotation

Why not use the same toxin consistently if its effective the first time? There is a very good reason why not. some animals can take a sub lethal dose and can become "educated" to the fact that eating that makes them feel unwell. It is so important to use a range of different poisons not only throughout the year but also over the years. For example, doing an operation of Cholecalciferol then later in the year or the following year (depending on what's needed) undertake a diphacinone operation. This is so animals don't get used to specific baits and learn to avoid them. This goes the same for trapping, it is important to use a diversity of traps so animals who become shy of a certain type of trap can still be caught in another trap because its different and they don't associate it in the same way.

Don't leave your baits out!

This is another important factor when doing a toxin operation. Baits should only be left in stations for a limited time depending on the type of toxin (see toxin list). This is because if bait is left out too long or goes off in the station it can become unpalatable and will also cause animals to become bait shy making pest control a lot harder.

When to do an operation.

1. It is always best to lay baits when animals are hungry. This is around the colder times of year, especially going into winter. This is because they are trying to build up fat reserves so will be less fussy as to what they eat meaning you're more likely to get a better hit with you operation. Operations done at times of the year when there is lots of food around often have less bait take as animals can be slightly more fussy as they have lots of options.

2. Think about when the species you are trying to protect are breeding. It is often a good idea to do a pulse around spring as birds start breeding and you will increase their chances of having successful nests.

Post operation monitoring

It is always important to do another series of monitoring after conducting an operation. This will show the change you have made and will demonstrate the results of your work. It may also show that you need to go back to a certain area and do more work. Make sure the same methods are used for post monitoring as the pre monitoring. This is important to make sure your data is comparable.

It's a constant battle!

It can be a constant battle trying to keep pest numbers way down, so work strategically to defend your area. Use your monitoring tools to show areas that need more attention than others. You should be able to get to a point where you can get away with doing small toxin pulses of small amounts of bait to control pests in the core of your area and use more of your bait on the surrounding areas/buffer zones. All this toxin work should be combined with trapping to get the best result as it takes a range of different tools to achieve a worthwhile result.

Poison list and methods

Double Tap is a newly developed toxin. Its active ingredients are a mix of Diphacinone – 0.05g/kg and Cholecalciferol (Vitamin D3) – 0.60g/kg.

This toxin is best used outside of the hotter times of the year as baits deteriorate faster in hot conditions.

Two pulses minimum is recommended but in areas where there is a noticeably high take (e.g. G line on Tahi) 3 pluses may be required to have the desired effect.

Start the first pulse in July, leave baits for approximately 2 weeks then apply second pulse.

Start first pulse with 150g per station then on second pulse if station is empty use 150g dose again but if all bait is not taken use less toxin between 100-70 grams to prevent bait wastage.

Work systematically over the area, laying toxin in lines which are next to each other so you are not leaving gaps.

Once temperatures start to increase (end of October early November) end the operation as bait goes off fast and becomes unpalatable to animals.

Once the laying of baits is finished go through each line and make sure bait stations are left empty and clean for next time.

Diphacinone

Very effective on rats however not effective on possums so would work best if followed with cyanide.

Comes in different forms and several of these should be used to test what form is best.

Start first pulse with 100g per station then on second pulse if station is empty use 100g dose again but if all bait is not taken use less toxin between 70-40 grams to prevent bait wastage.

Work systematically over the area, laying toxin in lines which are next to each other so you are not leaving gaps starting either at the back of the farm (G line) and working to the front (I line) or vice versa.

Diphacinone like Double Tap requires multiple feeds so 2 pulses minimum are recommended however more may be needed where rat numbers are still high.

Check stations 2 weeks after first pulse and re bait where needed.

The aim with this toxin is to consistently keep rat numbers below 1% density throughout summer.

After operation (end of March at latest) make sure no bait is left out to avoid animals becoming bait shy and so stations are clean and ready for next time.

Cyanide is used for the control of possums. It kills a possum up to 6kg and is not effective on rats so is best used immediately after Diphacinone.

Feratox capsules are carefully rolled into the middle of a golf ball sized ratabait paste or ferafeed paste then put into bio bags ready for laying.

This is a controlled substance and requires a CSL so make sure all requirements are in place including proper signage at public entrance points.

Make sure PPE is used where needed and antidote is available.

Filled biobags should stapled to trees approximately 60cm above the ground.

Biobags with Feratox should be distributed in lines which are 100m apart and one to two bags on a tree every 50m

This should be used immediately after a diphacinone pulses in bait stations.

Cholecalciferol (feracol strikers)

For the control of rats and possums.

This should be used over summer (after 1080 or diphacinone and cyanide depending on cycle) to keep rat numbers below 1% density and maintain low possum numbers.

Strikers should be stapled to trees approximately 10cm off the ground.

In areas with high possum and rat density, staple strikers to trees every 5-10 meters, but in medium to low density areas strikers should be stapled every 20-40 meters

Ferafeed strikers are a pre feed form of the striker and should be used before feracol to increase kill rate.

Roughly 10 days after prefeed strikers have been out the feracol strikers should be laid, making sure they are on the same tree or close to where the pre feed was stapled.

Sodium fluoroacetate

A primary and secondary poison to control rats, possums, stoats, weasels, cats and ferrets.

This is to be used every second year over spring to knock back trap shy predators like stoats.

This is a controlled substance and requires a CSL so make sure all requirements are in place including proper signage at public entrance points.

Make sure PPE is used as needed.

Because stoats can have a home range up to 200 ha this operation is best when the 1080 TOXIN is laid simultaneously over the whole area NOT in stages like other toxin pulses. However, prefeed can be done in stages if more convenient.

Ensuring there is a period of zero toxin work is done for months prior to a 1080 operation is best so rat and possum numbers begin to increase. This ensures that a larger take is achieved resulting in a higher chance of a secondary poisoning of predators like stoats.

Start pre feed late September early October

One pre feed minimum is needed however 2 prefeed or leaving pre feed longer, monitoring take and toping up where needed could result in a more successful operation.

Add roughly 200-300 grams pre feed into each station.

After 15 days minimum lay 200g of toxin in each station.

The longer the toxin can be out the better so after approximately 15 days remove all the toxin from each station so they are clean and ready for next time.

Dispose of toxin appropriately by burying 60cm below surface. It breaks down rapidly and has no lasting environmental effect.

Bait Stations and Traps (August 2025)

- 1253 Philproof bait stations put in on 50 x 100m grid for rats and possums and secondary poisoning of cats and mustelids
- 16 *DOC 250* for ferrets and stoats
- *103 DOC 200 for stoats and weasels*
- *23 AT220 automatic resetting traps for possum and rats*
- *11 Fenns for mustelids and rats*
- *3 live traps for cats*
- *110 SA traps for possums or rats*