

**Application Form for removing
surviving or invading ship rats
(*Rattus rattus*) in the Perth River
valley**

September 2019 – September 2020

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13 Sept 2019



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1. Introduction

1.1 Overview

Zero Invasive Predators Ltd (ZIP) is collaborating with the Department of Conservation and Predator Free 2050 Ltd on a research and development programme over an approximately 12,000 hectare block within the Perth Valley. The purpose of this research programme is to test and refine a predator management approach to completely remove possums from large areas, and prevent them from re-establishing. The work will also seek to develop this approach for ship rats and stoats.

In July 2019, ZIP completed a two-phase '1080-to-Zero' operation over approximately 9,000 ha in the Perth Valley, South Westland. This operation used a novel prescription involving two applications of prefeed and two applications of 1080 baits with the aim of completely removing possums, rats and stoats from the site. If successful, it will be a ground-breaking achievement and a critical step on the pathway to a Predator Free New Zealand by 2050 because it will show that currently-available tools can be used to achieve landscape-scale eradication (not suppression) on the New Zealand mainland. As such, this is a nationally significant project.

At present, ZIP are intensively searching the Perth site using cameras and chew cards with the aim of locating any surviving rats, stoats, or possums so that these individuals can be targeted for removal (see Appendix 6 for details).

Our current 'mop-up' plan for responding to any *rat* detections involves targeting an area surrounding the detection site with additional detection tools to confirm continued rat presence at that location, and kill traps to remove them. Failure to eliminate surviving rats, or potentially their offspring, jeopardises the project as a whole.

We therefore seek permission to use brodifacoum baits as an additional survivor-response measure, to be used under strictly regulated conditions to give us the best possible chance of eliminating any rats detected, and achieving our goal of site-wide rat eradication. In addition, we seek permission to use brodifacoum baits in the case where we have reason to believe that a breach in our geographic barrier system is likely to have occurred, for example the discovery of a new vegetation or rock bridge (likened to a hole in a predator-fence).

Our strategies to remove any surviving or invading possums or stoats do not involve use of brodifacoum or other anticoagulants.

The Department of Conservation's policy on the use of second-generation anticoagulants (docDM-97398, last updated 23/11/2018) states that brodifacoum and other second-generation anticoagulants may only be used in operations that:

- target rodents only; and
- use captive baits in bait stations designed to exclude other animal pests present (especially possums); and
- where pigs cannot be exposed to the toxin.

ZIP's proposed use of brodifacoum as part of a survivor or incursion-response toolset would breach the second of the above restrictions because we intend to use non-captive baits in bait stations to maximise the likelihood of eradication success. We therefore seek an exemption from the Director, Operations (Western South Island) to allow us to use brodifacoum deployed in response to confirmed rat detections or likely geographic barrier breaches starting on or after 20 September 2019 and ending on or before 20 September 2020, following the methods and restrictions described in this document.

In what scenarios would we use brodifacoum?

A single rat or ambiguous 'rodent' detection on a camera or chew card will trigger a primary response consisting (all or some) of: kill traps, chew cards, tracking tunnels, and additional cameras deployed over an area of at least 2 ha surrounding the detection. The aim of the primary response is to either trap the rat(s), or at minimum confirm it is still in the area.

In addition to the primary response tools listed above, we request permission to use brodifacoum pellets as an additional option for response. We will consider this option only where the following conditions are met:

- Have evidence that suggests with a high degree of certainty that the animal is a rat(s), not a mouse (e.g. identification on camera, chew card, or tracking tunnel); and
 - The terrain and accessibility of the detection location permits installation of a grid of bait stations covering an area of a minimum 2 ha and up to 16 ha; and
 - The extent of detections (if more than one) is contained within the 2–16 ha area to be treated; and
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-
- No more than 2 previous brodifacoum grids have been used elsewhere on site within the one-year permitting period (i.e. maximum 3 different locations for this response treatment).

OR

- Have evidence suggesting that a breach of our geographic barrier is likely to have occurred, resulting in likely rat incursion into the Perth River valley site (e.g. treefall that creates a natural bridge over the river boundary)

It is proposed that the following pesticide uses will be applied:

- Pesticide Use #53; Brodifacoum 0.02g/kg; Pestoff Rodent Pellets; bait station

Permission is sought for toxic application starting on or after 20 September 2019 and ending on or before 20 September 2020.

**1.2
Treatment
area**

Part Waitangi Forest Conservation Area and part Adams Wilderness Area, Whataroa/Perth catchment, South Westland.

Treatment area for this brodifacoum use is between 2 – 16ha, depending on terrain at specific point of detection.

**1.3
Treatment
block(s)**

Perth River valley rat detection block. 2-16ha.

**1.4
Geographical
location**

The project area lies in the mid to upper reaches of the Perth River catchment (a major tributary of the Whataroa River), upstream of Pauline Stream. This includes the Barlow River, part of Scone Creek, Bettison Stream and upper Perth River catchments up to the spine of the Southern Alps.

The nearest town is Whataroa, 16 km downstream to the north west.

**1.5
Adjacent land
tenure and
uses**

Adjacent land to the project area is all Crown Public Conservation Land, as part of the Waitangi Forest Conservation Area (Stewardship Area) or the Adams Wilderness Area (Conservation Area).

The closest privately owned land is on the Whataroa River TL at Tommy Creek, 10km downstream from the project area boundary.

**1.6
Nearby
residential
areas or
facilities**

There are no permanent dwellings within the project area.

The nearest residential areas/dwellings are farming residences on the east side of Whataroa, on the Whataroa River plain 12km downstream from the project area.

The project area does not affect any water supply catchments servicing these areas.

**1.7
Community
interests**

There are 3 DoC tracks in the project area along with 1 hut - refer to accompanying maps. The Perth Valley tracks are classed as advanced tramping or expert level.

Feral pigs are absent at the Perth site, however deer, tahr and chamois are present and hunted as game by recreational hunters and wild animal recovery operators

**1.8
Management
history**

The Department of Conservation has undertaken possum control (in the form of ground and/or aerial control) over the forested sections of the treatment block five times since 1997. Typically the treatment area has been the Whataroa-Perth Valleys (i.e. larger than the proposed operation), but only to the upper extent of the bushline.

The last operation, before the ZIP programme of work, was an aerial 1080 operation in October 2012 – the Whataroa was broadcast sown at 2kg/ha with 12g bait, while the Barlow section (north of Perth River and east of Barlow river) was cluster sown with 6g bait at 0.5kg/ha. The immediate post-operational monitoring recorded 0.5% RTC possum. Based on the possum monitoring carried out in 2017, the next aerial operation was not scheduled until 2020.

2. Outcomes and targets

**2.1
Conservation
outcome(s)**

The project outcomes of note for this application are:

1. To develop new knowledge, tools and techniques about how to completely remove and prevent the re-establishment of ship rats (of which this survivor removal or incursion response use is a component).

**2.2
Target(s)**

The target is the complete removal of ship rats from the Perth River valley project area, and the ongoing maintenance of the site in a rat-free state.

3. Consultation and consents

3.1 Consultation

We consider the only interested party that will be affected will be the hunting community – including wild animal recovery operators for that area, and individual recreational hunters. The hunting caution period only commences once the brodifacoum has been first applied. Given the small scale nature of the application, we propose to notify this extent of area under the caution period via the Pesticide Summaries website. In this way, the actual area will be identified as opposed to the full potential area which has the risk of unnecessarily alarming the hunting community. In addition, our toxic warning signs will be accompanied by a map that clearly articulates the boundaries/area under caution.

We propose to inform these hunting interests of the potential small scale use of brodifacoum via a notification letter; explaining the need for the tool, the limited use, and the implications for hunting and subsequent plan for notifying its actual use via the Pesticides Summaries.

3.2 Consents

Not applicable

4. Methods

4.1 Treatment block 1

Perth River valley rat detection block – 2-16ha

Pesticides—bait station

Describe the pesticide use, covering the following points:

Pesticide use 53	Target pest
Brodifacoum; 0.02g/kg; Pestoff rodent pellets; bait station	Ship rat (<i>Rattus rattus</i>)

Brand name of pesticide	Pestoff Rodent Pellets
Lure/mask (& %)	None
Type of pre-feed (lure/dye)	None
Number of pre-feeds (if any)	None
Prefeed quantity when filled	None
Toxic bait-number fills	Up to 10

Toxic bait quantity when filled	32g per bait stations
Describe pattern of bait stations (e.g., grid/contour/ spur-ridge)	Grid, around the point of rat detection
Bait station spacing	50m x 50m (where applicable)
Bait station type	Novacoil (50cm long with 100mm internal diameter)
<p>Other details about this method</p> <p>Novacoil pipe bait stations (50 cm long and 100 mm internal diameter, open at each end) will be deployed at an anticipated density of 50 x 50 m over an area of up to 2–16 ha surrounding the detection (or adjacent to the suspected geographic barrier breach location). Novacoil pipe bait stations are readily entered by ship rats, and in captive trials had the equal highest proportion of rats eating bait, and equal highest amount of bait eaten in comparison to three other bait station types¹.</p> <p>Each Novacoil bait station will house a maximum of 16 x 0.02 g/kg Pestoff 20R cereal pellets (2 g) (or 32 1g pellets, depending on manufacturer availability), equivalent to approximately 4 lethal doses per station (assuming no non-target bait take). Over a 16 ha grid, the largest we would use, a total of 2.59 kg of pellets (or approx. 52 g of active ingredient) would be used in the initial bait station deploy. Bait stations will be serviced every 2–10 days (weather permitting), and where pellets have deteriorated or been removed we will replace them such that 16 (32) pellets are available after each service. The pellets will be non-captive to allow rats to take the baits away from the bait station and back to their nest. This will both increase the likelihood that a lethal dose will be consumed, and make baits accessible to any offspring that may be resident in the nest.</p> <p>Bait stations will remain in place for a minimum of 3 weeks, and a maximum of 10 weeks. Subsequently, all remaining brodifacoum pellets and bait stations will be removed from site and disposed of responsibly according to manufacturer instructions.</p>	

4.2

Brodifacoum is the VTA with the best track record for rodent eradication, having been used extensively to eradicate rodents

¹ Spurr EB, Morriss GA, Turner J, O'Connor CE, Fisher P. 2007. Bait station preferences of ship rats. Wellington, NZ: DOC Research & Development Series 271, Science & Technical Publishing, Department of Conservation

Justification for proposed method

from offshore islands, and behind predator-fences on mainland New Zealand.

The delayed onset of toxic symptoms for animals poisoned with brodifacoum means that no prefeed is required, and rats are very likely to eat a sufficient amount of bait to be lethally dosed; approximately 6g at 0.02 g/kg concentration². A further advantage of delayed toxicosis is that bait shyness is unlikely to develop in any rats that are sub-lethally dosed, meaning that the bait can be repeatedly presented if necessary.

Furthermore, the Pestoff 20R brodifacoum pellets that we propose to use contain no mask or lure. This means that any 1080-shy surviving rats may be more likely to consume the brodifacoum pellets, as they will smell different to the orange and cinnamon-lured 1080 baits previously used in Phase 1 and Phase 2 of our 1080-to-Zero operation, respectively.

Why have we rejected other toxin options?

ZIP currently have DOC and MOH permission to use 1080 as an aerial tool to respond to rat detections. However, any survivors of ZIP's 1080-to-Zero operation are very likely to be averse to 1080 baits due to prior exposure to two applications, hence we would not expect 1080 to be the most effective toxin for survivor mop-up. Rather, we anticipate that an aerial 1080 response would be best used where a breeding event is suspected (e.g. juvenile, or lactating female, captured). In addition, 1080 is most effective after pre-feeding, which delays deployment in a potentially time-critical response. Available first-generation anticoagulants require rats to feed on them over multiple consecutive days before a lethal dose is achieved, which is undesirable in a context where rats may be dispersing, or roaming more widely than usual in an attempt to locate other survivors or re-invaders.

5. Further information

Details of contractor or principle

If the operation will be contracted to another company, or if this application is being made on behalf of a principle organisation please provide the following details:

Company/organisation:	Not applicable
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² Broome KG, Fairweather AAC, Fisher P. 2017. Brodifacoum Pesticide Information Review. Version 2017/1. Unpublished report docdm-25436, Department of Conservation, Hamilton, NZ. 140p.

Contact person:	
Contact number:	

Further information

Refer: *DOC agreement to support the research and development programme Whataroa/Perth Valley (doccm 5387479)*

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Appendix 1: DOC Performance Standards

Insert the appropriate sheet of Department of Conservation (DOC) Performance Standards for each pesticide use proposed for the operation. Complete all areas shaded grey on the sheet. This includes retaining the additional performance standards and information needs in the grey boxes that you propose for the operation.

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◆ INCLUDE ONE SHEET PER PESTICIDE USE ◆ COMPLETE SHADED AREAS ◆

Pesticide Use #53	Brodifacoum 0.02g/kg Cereal pellet Bait stations (Pestoff Rodent Pellets)	Target Pests: Rats, Mice
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Location of operation
<i>Perth River valley project area</i>

Caution Period
The estimated caution period for this operation is <i>[assessor to complete]</i> months after bait removal. This estimated caution period cannot be less than 36 months, unless the area is closed for hunting for at least 36 months or if the area has no animals to hunt, then the minimum caution period can be reduced to 12 months after bait removal.

Compulsory Restrictions
<ul style="list-style-type: none"> ▪ The Use of Second Generation Anticoagulants on Public Conservation Lands Policy docdm-97398 applies. ▪ This pesticide use can only be used for operations: <ul style="list-style-type: none"> - that use captive baits in bait stations designed to exclude other animal pests present (especially possums); and - where pigs cannot be exposed to the toxin. ▪ At mainland sites this pesticide use is restricted to one or two operations per lifespan for the longest lived native animal species likely to be exposed. (An operation is defined as the application of the pesticide for long enough to achieve the operational target.)

Performance Standards
<i>Compulsory for <u>all</u> operations</i>
<ol style="list-style-type: none"> 1. The baits must be dyed green or blue. 2. For operations targeting mice, bait stations must be spaced in a grid no more than 25m apart. 3. Bait stations will be removed or made pesticide-free at the completion of the operation. 4. The product must only be used as specified on the manufacturer's product label.

Information Needs
<i>Compulsory for <u>all</u> operations</i>
Nil

Operational Planning & Design Considerations
<ul style="list-style-type: none"> ▪ Current Agreed Best Practice – Rat Control – 2nd Generation Anti-Coagulants in Bait Stations docdm-29380.

My approval dated *[date]* is subject to these performance standards being met. Compliance monitoring may occur.

[Name] Operations Manager

Appendix 2: Maps

Both of the following must be supplied:

1. DOC permission map(s) as one or more image files (.JPG format preferred)
2. DOC Pesticide Summary shapefiles (**not required for DOC pest operations**)

Your DOC permission map(s) must show the following as a minimum:

- The external boundary of the treatment area or those treatment blocks included in this operation
- Legal boundaries of land managed by DOC
- Name of treatment area
- Land tenure and adjacent owners, including leased land
- Any areas excluded from the treatment area (such as around public water supplies, pā sites)
- Location of any warning signs and public information signs
- Location of normal points of entry where warning signs must be a minimum size of A3
- Bodies of water (include rivers, streams, lakes, reservoirs, wetlands, coastal marine areas)
- Recreational facilities (tracks, huts, road ends, roads, picnic sites)
- Date map prepared

NOTE: 1:50,000 is the preferred scale. Use more than one map if the amount of detail becomes to visually cluttered to be clearly understood.

The DOC Pesticide Summary shapefile(s) will be published on the DOC Pesticide Summary website, initially as a proposed operation. It must be obvious which control methods are proposed for each treatment block. The shape files must also show all boundaries relating to the operation (treatment area/block, exclusion zones, no fly zone etc.) and warning sign locations. DOC pest operations are already captured in the Pesticide application so do not need to supply shapefiles with the application for DOC permission.

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Appendix 3: Communication Record

- Not applicable

Appendix 4: Consents

Not applicable

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Appendix 5: Assessment of environmental effects

Complete this section if an Assessment of Environmental Effects (AEE) is required by the DOC manager approving the permission. An AEE that has been prepared on the DOC RMA AEE template (docdm-96227) for a resource consent application can be attached instead if it covers all the pesticides uses in this application.

Effects on non-target native species

Target benefit species

The project is not directly about protecting native species. The Perth River valley project is a research and development programme of work seeking to develop the knowledge, tools, and technologies to completely remove predators and then prevent their reestablishment. While this work will benefit native species at site, it is the anticipated success of a new model for predator management that is expected to help native species in the long term (both here and elsewhere in the country).

Non-target species

Non-target native bird species present at site include kea, whio, rock wren, tomtit, fantail, bellbird, robin, waxeye, weka, tui and kereru.

Effect of operation on native species

Due to our proposed use of non-captive baits in Novacoil pipe bait stations, there is an increased risk that non-target native birds will be exposed to brodifacoum (relative to captive baits). However, the small scale over which we propose to use brodifacoum, as well as the small number of baits per station minimises the likelihood that native bird species will be impacted at the population level. The benefits of successful eradication of rats in terms of improved breeding outcomes and survival are expected to far outweigh any impacts in terms of non-target deaths.

Performance standards and information needs

The scale of use of brodifacoum will be extremely limited – no more than 16ha in area, with no more than 3 grids of that size to be deployed in the course of this application period (1 year). Furthermore, very little brodifacoum will be deployed into each station (32g of bait; or 0.64g of active ingredient).

No other performance standards recommended.

Effects on non-target domestic and feral animals

Non-target species

Red deer, chamois, Himalayan tahr

Effects of operation on domestic and feral animals

To date, no brodifacoum residues have been found in chamois following bait stations operations using brodifacoum, but the sample is only 0 from 3.

There appears to have been no testing in Himalayan tahr.

Residues have been found in deer – 13/52 liver samples and 1/14 muscle samples.

There will be a 36 month hunting caution period based on the area of brodifacoum use, with a 2km buffer on that, to minimise risk of residue entering the human food chain.

Performance standards and information needs

No other performance measures recommended.

The scale of use of brodifacoum will be extremely limited – no more than 16ha in area, with no more than 3 grids of that size to be deployed in the course of this application period (1 year). Furthermore, very little brodifacoum will be deployed into each station (32g of bait; or 0.64g of active ingredient).

Further information

Further information

Provide any other information or comments you would like to have considered.

References

The following published references were used in developing this AEE:

- Broome KG, Fairweather AAC, Fisher P. 2017. Brodifacoum Pesticide Information Review. Version 2017/1. Unpublished report docdm-25436, Department of Conservation, Hamilton, NZ. 140p.

Appendix 6: Current rat detection network and plan

Detection takes place on a main track which follows the Perth and Barlow rivers, as well as proof of freedom (PoF) lines, spaced 700 m apart. Detection is primarily in indigenous forest, and up to 1431 m in elevation (see map).

During the initial 'survivor detection' period of approximately 15 weeks after Phase 2 of our 1080 operation (i.e. until early November 2019), chew cards filled with Pic's peanut butter are deployed at 20 m spacing up to the bush line along all accessible PoF lines and the main track. Some sections of track are currently excluded due to high avalanche risk. In addition, there is a permanent network of cameras lured with ZIP ALDs (automated lure dispensers) operating at 500 m spacing along PoF lines and the main tracks (totalling 146 cameras), at altitudes ranging from 237–1431m.

After the survivor detection period, and assuming no detections or barrier breaches have occurred within this period, detection effort will be leaned back as it targets the first generation of invading rats. The current plan (subject to change) is that the network of ALD cameras will remain in place, and ZIPim traps (a tunnel trap with a CO₂-release kill mechanism and auto-reporting functionality) will be installed sequentially, at an ultimate density of one every 100 m along the PoF lines and main track.



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