

Possum Control in Papakai Ecological Area 2017

Version History

Version	Author	Date Written	Change/Reason for change
1	s 9(2)(g)(ii)	March 2017	
2	s 9(2)(g)(ii)	12 th April 2017	Revision with suggestions from peer reviewer
3	s 9(2)(g)(ii)	31 st August 2017	Revision with suggestions from peer reviewer

Overview

Conservation outcome

To preserve the health and integrity of the forest plant communities within the Papakai ecological area.

Scope

This project is to carry out possum control in the Papakai ecological area. This plan covers the details of the project's technical design and the organisation of the logistics for doing the work in the operational phases (pre-operational, operational & post-operational). It includes result monitoring.

This project ends when lessons and recommendations from the Pestlink report have been followed up. This is expected to occur by December 2017.

Outcome target

To protect the health and integrity of Papakai forest communities

Forest canopy condition will be assessed using possum susceptible species as indicators, specifically: (i) to reduce foliar browse scores to less than 0.5 and (ii) halt possum induced mortality of canopy trees. This is covered by the Conservancy vegetation monitoring plan 2003 – 2012

Result target

The result target for this operation:

1. A residual trap catch of less than 2% (2 possums per 100 trap-nights) by 30th November 2017 for the aerial controlled area.

Control Design

The treatment area covers 11,535 ha comprising of Papakai ecological area Coromandel Peninsula (see map).

To achieve the outcome target, possums need to be controlled over the range of forest habitats in the Area. This will be achieved by using one method;

1. An aerial application of 1080 over 11,535 ha of the block.

The operation is planned to take place in July- September 2017. This time has been chosen as the best time to conduct the operation as possums are more vulnerable to poisoning in winter/ early spring where alternative food sources are seasonally low.

Some of the treatment area shares a boundary with private pine plantations. Consideration has been given in terms of timing of the operation to ensure possums are not being drawn into the production forest at the time of pine pollination which is around the month of August.

Limiting the re-invasion of possums from habitat adjacent or near the boundary supports the conservation outcomes that this operation is looking to achieve. To aid with this, consideration has been given to a coordinated effort with Waikato Regional Council (WRC) but has not amounted to a joint operation. The author is liaising with the Mahakirau Forest Estate community located between the Goldfields (Kakatarahae) block and the 309 road, who have an effective on-going pest control programme. Mahakirau Forest Estate Community have requested that they would like their block to be included into the aerial operation, and have allowed the Dept of Conservation to use the back section of the estate to carry out the helicopter operation from. Also the Te Mata private forestry block which is adjacent to the Papakai block have been carrying and pest control mainly using traps and cyanide.

Future pest control operations in this area will depend on initial control levels achieved from this operation and on the rate of re-invasion from adjacent areas. It is expected that the possum population will take at least four years before they begin to have a measurable effect on the indicator species. Operations are planned to be carried out every four years over the next 50 year period.

One application of 1.5 kg (6 gram bait per hectare) of pre-feed cereal bait will be sown by helicopter for the aerial operation. Following the pre-feed, 1080 will be applied at a rate of 2 kg per hectare, with a maximum window of 6 weeks between sowing the pre-feed and the 1080 baits. The contingency plan if the 6 week weather window is not available will be to re-sow the area the pre-feed bait at a rate of 1.5 kg per hectare. The timing of the sowing of the 1080 baits will require a weather window of three fine nights to achieve maximum toxin uptake.

Site description

The Papakai ecological area and Goldfield (Kakatarahae) block is in the Thames Ecological District. The sanctuary is 27 km north of Thames, located in two large catchment areas that feed the Manaia and the Kaimarama Rivers. Two prominent features include Kakatarahae (725m asl) on the eastern boundary and Horomanga (574m asl) which is central to the block. Papakai ecological block runs from the Tapu Coroglen road heading North West until it marries up with the Manaia Kauri Sanctuary (Kaakatarahae), the three main features in this area are Papaki (750m asl), Rapaki (694m asl) and Pukeotahu (540m asl). The Papakai catchment area flows into two main rivers, Te Mata to the West and Ounui to the East.

Conservation Values

The Papakai ecological area contains a number of different systems in the one area. The sanctuary is the largest remaining stand of kauri on the Coromandel peninsula and is home to Tanenui, the third largest kauri left standing in New Zealand. The sanctuary has an international classification (IUCN 1). The large number of big kauri dominate the landscape, surrounded by podocarp/hardwood forests that have large mature stands of miro, rimu and rata, amongst kohekohe and tawa. King fern is present in some areas.

Korimako, tui, kereru, North Island kaka, piwakawaka and riroriro are all present.

The sanctuary has a population of North Island brown kiwi and long tail bats have been reported there.

The forested catchments are home to giant kokopu, banded kokopu, short and long finned eels, inanga and red finned bully.

The diversity of plant life throughout the reserve inspires numerous visits by botanical enthusiasts throughout the year.

Manaia was gifted by Ngati Maru to Ngati Pukenga in recognition of assistance rendered by that Bay of Plenty tribe during the “ musket wars “. This is one of the few large Maori owned areas in Hauraki.

Manaia is the largest Maori community on the peninsula north of Thames. The people are of Ngati Pukenga, Ngati Whanaunga and Ngati Maru tribes. The marae is Te Kou o Rehua.

Manaia was a rich resource area: “Ko Manaia, he pataka kai” (Manaia the food store). Fishing and mussel farming employ locals. Mangrove extension and siltation are problems in Manaia Harbour, as in most other estuarine harbours of the peninsula.

The Manaia Forest Sanctuary, which contains 400 kauri trees, was established in 1972 after local protest against planned logging.

Threatened species

Coromandel brown kiwi

Coromandel Brown Kiwi (CBK) are present in the operational area. CBK's are the rarest of the North Island brown kiwi taxa with an estimated 900 pairs across the Coromandel. Kiwi densities are highest in the northern regions of the Peninsula, however, birds in the Papakai region, represent important genetic diversity.

Dwarf-greenhood orchid

The dwarf-greenhood orchid or *Pterostylis puberula* is classified as Nationally Vulnerable. The monitored population consists of approximately 130 individuals. Rat control is one of the current management prescriptions as rat herbivory is thought to be a threat. Past monitoring shows a population spike co-inciding with aerial 1080 application in 2008.

Long-tailed bats

Long-tailed bats have been recently (2013) found along the Tapu-Coroglen Rd, Long-tailed bats are likely the only native land mammal on the Coromandel. Searches continue for short-tailed bats, but none have been found to date.

Dactylanthus taylorii/woodrose

Another interesting species is the native woodrose *Dactylanthus taylorii*. *Dactylanthus* is New Zealand's only totally parasitic flowering plant. It grows on the forest floor and parasitizes the roots of some 30 native species. This species used to be spread across the Peninsula and collected by enthusiastic ornament hunters. *Dactylanthus* dropped off the radar for nearly a 100 years.

The current known *Dactylanthus* population on the Coromandel consists of only two clumps. Work is underway to increase numbers through caging plants to exclude possums and hand pollination to increase seed set. Given that this species is cryptic, however, there are likely to be many undiscovered plants. *Dactylanthus* are at high risk from possum browse as the inflorescences produce copious sweet nectar. Unfortunately possums consume the entire inflorescence, eliminating that plant's ability to reproduce. Furthermore, rats consume the seeds reducing the reproductive success of the *Dactylanthus* population. Without pest control our *Dactylanthus* population would be at significant risk.

Other threatened plants

Operational Plan Papakai 2017 - DOC-3007403

Plumatochilos tasmanicum (Serious Decline)

Pimelea tomentosa (Nationally Vulnerable)

Psuedopanax laetus (Gradual Decline)

- The operational area includes the largest extent of this species in the Waikato Conservancy

Pittosporum kirkii (Serious Decline)

Marattia salicina (Serious Decline) – King fern

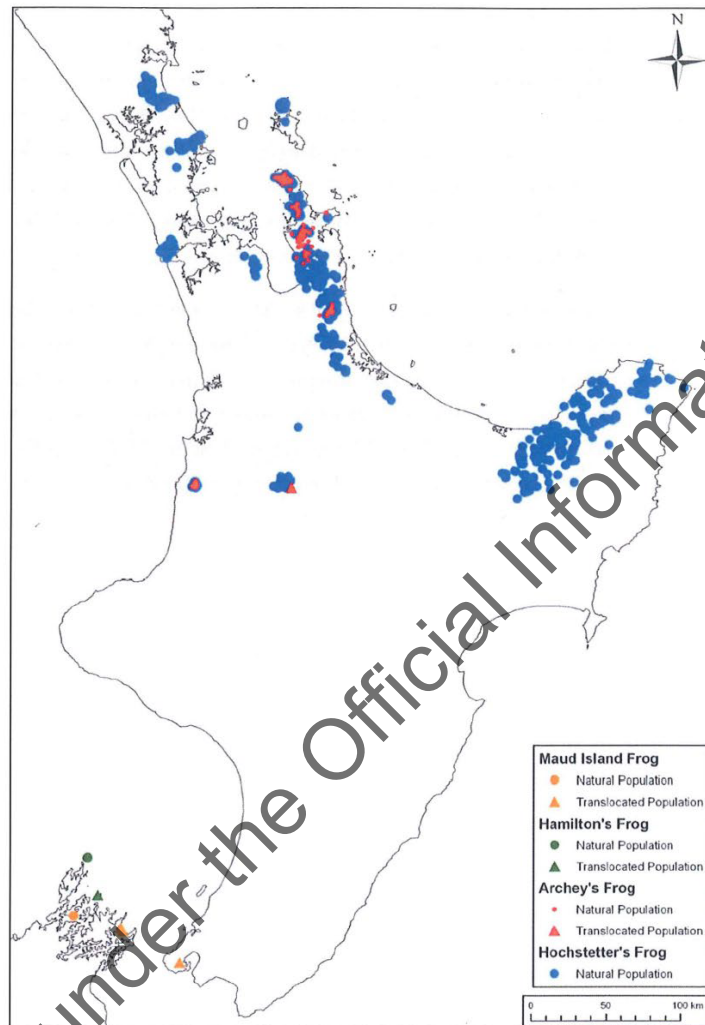
Epacris sinclairii (Naturally uncommon)

Raukawa edgerleyi (Gradual Decline) – Raukawa

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Archey's frog

The Coromandel Peninsula is home to the majority of the threatened Archey's frog range. The only other places they are found include a small coastal forest block in the King Country, Maungatautari and captive facilities such as the Auckland Zoo. The Coromandel represents the national stronghold for Archey's frog (see below).



It has been proven that rat predation has a significant impact on Archey's frog populations and that rat control has a positive impact (see Whareorino research).

Juvenile froglets on the back of an adult male were observed within the Papakai pest control operational area during a monitoring session in early 2014. This was direct evidence of breeding success.

Iconic species

In addition to high priority threatened species, there are also iconic species throughout the block.

Kauri

The Coromandel Forest Park includes impressive stands of kauri. Prime examples are the Waiomu Kauri Grove, Square Kauri and the Wainora Kauri. Kauri are a significant species, influencing community species composition through alterations to soil chemistry. Kauri are under threat from kauri dieback disease (*Phytophthora Taxon Agathis*), which has recently been confirmed on the Coromandel for the first time. The kauri in the southern Coromandel were some of the first stands to be extensively harvested in the 19th Century and so the current distribution is a small remnant of what was once a magnificent ecosystem.

Freshwater fish

Native freshwater fish have been recorded throughout the several catchments in the operational area including:

Smelt
Torrentfish
Banded kokopu
Long-finned eels
Short-finned eels
Red-finned bullies
Koaro

Threats

The usual hosts of pests are present; these include pigs, goats, rats, hedgehogs, mice, possums, stoats, weasels and cats. Possum numbers have been measured in March 2017 at 5.9% RTC, 10% RTC being the known trigger point for possum palatable trees in the area.

Goats and pigs are present on Central Coromandel and both cause damage to the forest ecosystem. The Department of Conservation began goat control in the area in 1987, and intensively from 1993. Monitoring of the forest under-storey has shown significant improvement.

Mustelids (weasels, ferrets and stoats) and feral cats are present. All four species threaten conservation values by preying on vertebrate and invertebrate populations, but the most destructive is the stoat. Stoats are adept tree climbers and, along with ship rats, will predate birds, nestlings, and eggs, as well as lizards and invertebrates within the canopy. Brown rats tend to be abundant along water courses and, together with mice, are opportunists, eating both vegetation and animal matter. Hedgehogs are also present, mainly preying on native invertebrates.

Domestic stock have access to one main section of the area, the Waikawau catchment. From this point stock have travelled along old forestry roads a distance into the area. This issue is currently being addressed through fencing

Issues

Treatment area is under Treaty claim, which could raise some sensitive issues between local Iwi and the Department. Due to sufficient consultation and engagement this should be limited.

Due to the rugged terrain and potential of heavy rainfall in the area there is the possibility of possum carcasses washing down the river and on to the coast. Even though this is a small possibility it could happen if the operation was to be conducted at another time of the year, to manage this in the case of such a rain fall the beach, main water ways coming out of Manaia and surrounding area will be monitored and the local population informed.

Some of the boundaries in the area around the operational area do have unfenced or sensitive areas, this concern could be mitigated through consultation or movement of the operational boundary and or stock.

Conflict with local pig hunting groups and the lack of access after the operation will be considered during the consultation process, Bait and carcass monitoring will be put in place in order to possible shorten the stand down period of the area after the operation is conducted.

Other management at the site

Past:

Year	Operation Name	Control Method	Pestlink Ref.
2013	Possum control	Aerial 1080	1314HAU02

Operational Plan Papakai 2017 - DOC-3007403

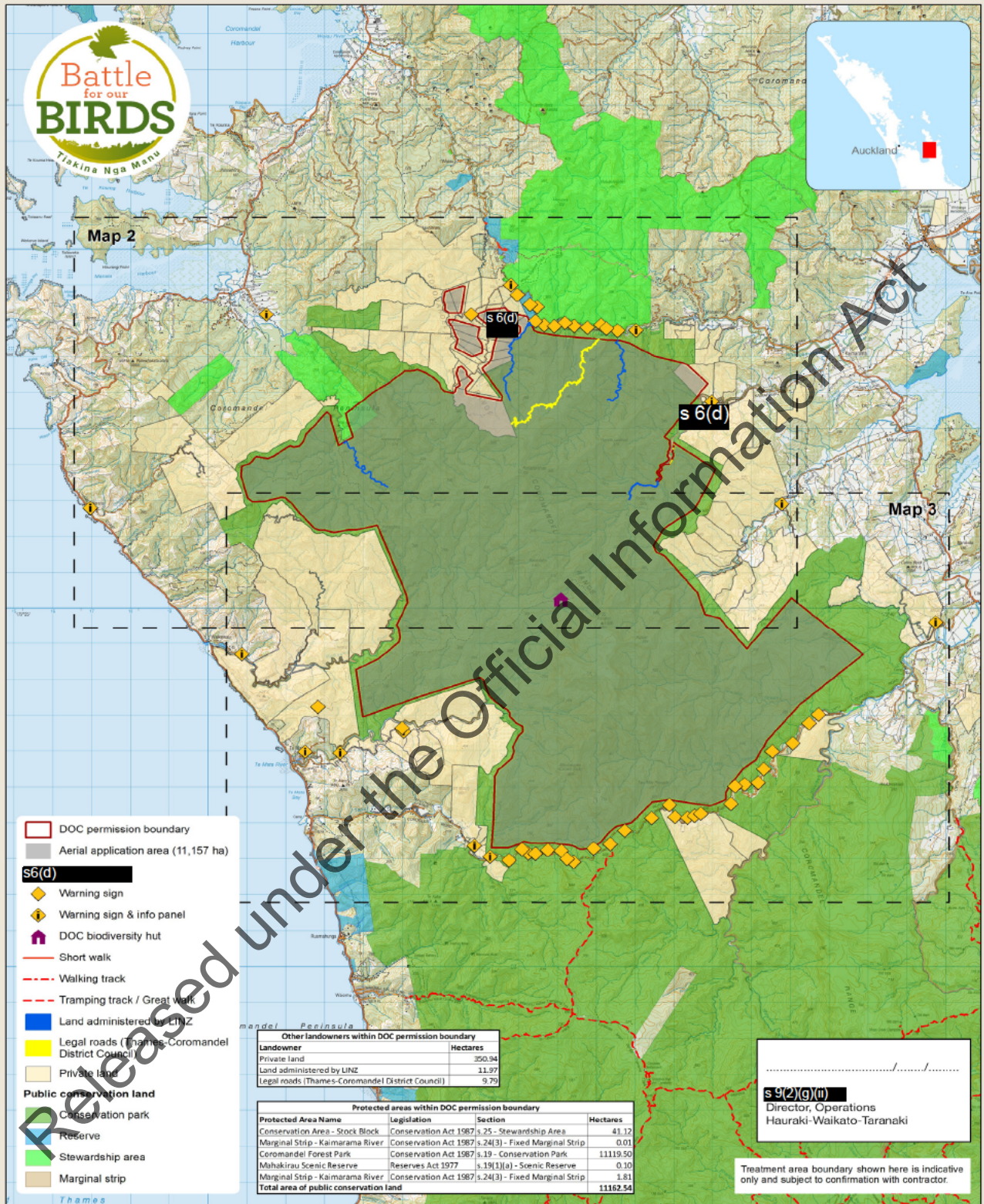
2009/10	Possum control	Ground, Cyanide	
2006/07	Central Coromandel and Whenuakite Aerial	Aerial 1080	
2002/03	Possum control	Ground, various methods	
1997/98	Possum control	Ground, various methods	
1994/95	Possum control	Ground, various methods	
2016	Goat Control	Ground, Aerial hunting	
2012	Goat control	Ground hunting	
2001/02	Goat control	Ground hunting	
1999/00	Goat control	Ground hunting	
1997/98	Goat control	Ground hunting	
1996/97	Goat control	Ground hunting	
1994/95	Goat control	Ground hunting	
1993/94	Goat control	Ground hunting	

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Where?

Map

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Papakai - DOC Permission Application

Map 1 - Overview

Aerial Predator Control 2017

Area of DOC permission application: 11,535 ha



New Zealand Government

What?

Method

Aerial application of 1080 cereal pellets @ 2 kg per ha for the Papakai block.

Timing

The Aerial component of the operation is planned to take place in the period 3rd July 2017 to 1st October 2017.

Method detail

The Aerial component of the operation will be conducted with the following method.

Brand name of pesticide	0.15% 1080 Pellets	
Name of pesticide	Sodium fluoroacetate (1080)	
Type of bait	Cereal pellet Wanganui #7	
Toxic loading	1.5 g/kg	
Bait Details	Pre-feed	Toxic
Bait type	Cereal Pellet	Cereal Pellet
Lure/mask	Cinnamon	Double cinnamon
Lure/mask	0.1.5%	0.3%
Dye	None	Green
Cereal Pellet Weight	6 gm	12 gm
Sowing Rate Details	1.5 kg per hectare	2 kg per hectare
Planned start date	3 rd September 2017	15 th September 2017

	TREATMENT AREA	BLOCK NAME	SOWING	HECTARES	RATE	BAIT
PREFEED	Papakai	Papakai	Prefeed	11,535	1.5 kg	17,302 kg
	4% contingency	Papakai	Prefeed	11,535	1.5kg	692
				TOTAL		

TOXIC	TREATMENT AREA	BLOCK NAME	SOWING	HECTARES	RATE	BAIT
	Papakai	Papakai	1080	11,535	2 kg	23,070 kg
	4% contingency	Papakai	1080	11,535	2kg	922
			TOTAL			23992 kg

Treatment details

No. of drops

Pre-feed

1

Toxic

1

Time between pre-feed and toxic

6 weeks maximum

Aircraft type

Helicopter

Number of Aircraft

2-3

Loading Method

Truck mounted crane and
hopperBait Type

This project will use 0.15% 1080 Pellets using Wanganui #7 20mm (12 g) baits. Baits will be 'double' cinnamon lured (0.3%).

Bait Transport

Bait will be transported to the site by the helicopter contractor.

Pre-feeding

Pre-feeding using non-toxic Wanganui #7 cinnamon lured 16mm (6g) bait will begin in the first suitable weather window on or after 03rd September 2017. Pre-feed baits will be sown at a rate of 1.5kg/ha

Toxic Baiting

Toxic baiting will follow at the first available weather opportunity at least 5 days after pre-feeding but not exceeding 6 weeks. In cast no weather window eventuates within this allowable interval there will be another prefeed application sown at 1.5 kg per hectare. Toxic bait will be sown at 2kg/ha A forecast of at least 3 nights with less than 10mm of rain in any 24 hour period will be required.

Bait loading

Despite using non-toxic baits the loading of pre-feed will be treated as a 'dress rehearsal' for toxic baiting so loading crews will wear full PPE as per Safe Handling Sheet 1. Helicopter company will supply all loading, driver, and delivery personal. The loading system will be debriefed at the end of pre-feeding and improvements made for the toxic baiting.

Clean up and disposal

Empty bags will be bundled into wool fadges on site and returned to the Coromandel DOC workshop bait store for later disposal. The helicopter transport truck decks will be inspected and swept before back-loading empty pallets and bags to the Coromandel DOC workshop bait store at the completion of toxic baiting. The helicopter bucket and loader will be washed down with high pressure water

after first removing any visible pellets remaining. The loading site itself will be fenced off. Fencing and loading site signs will remain in place until 50mm of rain has fallen on the site. Contaminated PPE will be disposed with empty toxic bait bags.

Outcome and Result Monitoring

Result monitoring

When monitoring the effectiveness of the operation, it is considered essential to measure:

- the abundance of possums in a treatment area prior to control (influences choice of control technique) (5.9% RTC current March 2017).
- whether the operation has reduced possum abundance to the target residual catch rate.

The aerial component of the operation the Papakai block will be set at 2% RTC. The monitoring of this will be conducted by contractors and carried out in a robust sampling method of 5 plots with 5 lines in each random selected location. The lines will be carried in accordance with the monitoring protocol (NPCA 2005). The reason for this alternative method is because of access problems, steepness of the terrain, and cost saving.

Outcome monitoring

Vegetation monitoring to assess the achievement of outcome targets will be carried every 5 years and results analysed to identify changes in forest health. Vegetation monitoring focuses on a few plant species (indicator species) known to be vulnerable to possum damage. Part of the operation's success will be assessed using vegetation monitoring results. This information will assist decisions on the timing of future possum control. Methods to be used are:

- Foliar browse index: assessment.
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How?

Consents required

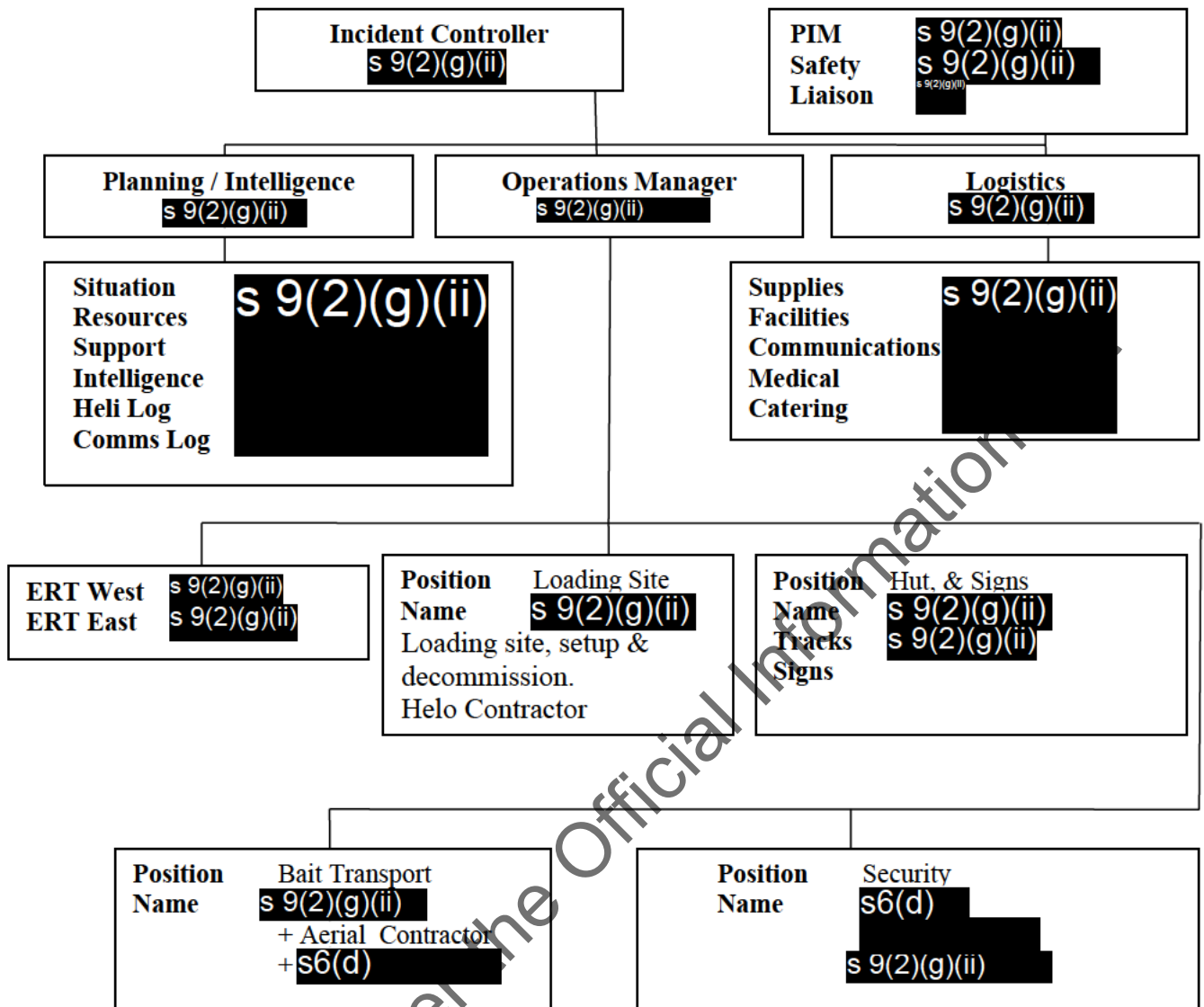
1. Landowner or occupier consent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
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2. Resource consent	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
3. Public health permission	<input checked="" type="checkbox"/> Permission <input type="checkbox"/> Notification <input type="checkbox"/> Not required
4. DOC permission	<input checked="" type="checkbox"/> Yes (operation involves pesticides) <input type="checkbox"/> No (traps or hunting only)
5. EPA permission	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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CIMS Structure

CIMS Structure



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**Papakai Aerial operation staff structure chart 2017
Prefeeding & Toxic drop**

Task list

<i>Phase</i>	<i>Target Date</i>	<i>Task</i>	<i>Delegated to:</i>	<i>Task specification</i>	<i>Date Completed</i>
	07.02.17	Mapping & Boundaries	s 9(2)(g)(ii)		
	20.02.17	Bait ordered	s 9(2)(g)(ii)		
	1.04.17	Pre Possum monitoring	s 9(2)(g)(ii)		
	31/08/2017	Revise in response to peer review	s 9(2)(g)(ii)		
<i>Pre-operational</i>	4/09/2017	MOH Consent-	s 9(2)(g)(ii)		
	30/07/17	Landowner consents	s 9(2)(g)(ii)		
	4/09/2017	Other Consents incl DOC approval	s 9(2)(g)(ii)		
	17.05.17	Revise planning documents in response to consultation	s 9(2)(g)(ii)		
	01.6.17	Revise in response to consents	s 9(2)(g)(ii)		
	August	Writing the task specs	s 9(2)(g)(ii)		
	September	Readiness check using the compliance register	s 9(2)(g)(ii)		
	31.08.17	Bait ordered quantity check	s 9(2)(g)(ii)		
	Ongoing	Maintain Communication plan	s 9(2)(g)(ii)	DOC-2973639	Ongoing
	30.07.17	Iwi notification	s 9(2)(g)(ii)	DOC-2973639	
	31.08.17	Pre-operational notification	s 9(2)(g)(ii)	DOC-2973639	
	July	Tender documents	s 9(2)(g)(ii)	DOC-	
August	Audit contractor safety plan	s 9(2)(g)(ii)			

	September	Contractor visit	s 9(2)(g)(ii)		
	September	Contract finalised	s 9(2)(g)(ii)	DOC-	
	July	Staff Training	s 9(2)(g)(ii)		
	August	Loading site preparation	s 9(2)(g)(ii)		
	August	Safety plans	s 9(2)(g)(ii)	DOC-3153621 Risk Manager 14930-Papakai Aerial 1080 Operation	
	August	Safety equipment organised	s 9(2)(g)(ii)	DOC 3152556	
	August	Safety briefing prepared	s 9(2)(g)(ii)	DOC 3011869	
	August	Field equipment organised	Logistic Team	DOC 3152556	
	August	Communication equipment	s 9(2)(g)(ii)	DOC 3152556	
	September	Arrange weather forecasting	s 9(2)(g)(ii)	Met connect	
	September	Check for pre-operational tasks in consent conditions	s 9(2)(g)(ii)	Still to be completed	
Operational	September	Check for operational tasks in consent conditions	s 9(2)(g)(ii)	Still to be completed	
	August	Updating the pesticides application	s 9(2)(g)(ii)		
	3/09/2017	Boundary & Exclusion zone check	s 9(2)(g)(ii)	Boundary Checks Task Spec	
	4 th September 2017	Prefeed Application	s 9(2)(g)(ii)	DOC 3011869	
	06/09/2017	Debrief prefeed operation		DOC 3011869	

	September	24-hour notice	s 9(2)(g)(ii) s 9(2)(g)(ii)	DOC-2973639	
	September	Install signs	s 9(2)(g)(ii) One other	Install Signs Task Spec	
	15/09/2017	Toxic Bait application	s 9(2)(g)(ii)	DOC 3011869	
	15/09/2017	On-site briefing	s 9(2)(g)(ii)	DOC 3011869	
	September	Safety Officer	s 9(2)(g)(ii)	DOC 3011869	
	September	Flight line downloads	s 9(2)(g)(ii)		
	September	Track clearing	Not required for Papakai		
	September	Disposal	s 9(2)(g)(ii)		
	September	Operation log	s 9(2)(g)(ii)		
	September	Notes for report	s 9(2)(g)(ii)		
	September	Security	s6(d)	DOC 3011869	
	September	Enquiries	s 9(2)(g)(ii)	DOC 3011869	
Post-operational	September	Check for post-operational tasks in consent conditions	s 9(2)(g)(ii)	See consents	
	September	Check stream banks for poisoned carcass after large rain events	s 9(2)(g)(ii)		
	October	Debrief completed	s 9(2)(g)(ii)		

<i>September and for 6 month after</i>	Sign maintenance & removal	s 9(2)(g)(ii)	-	
<i>6months after bait application</i>	Bait & Carcass monitoring	s 9(2)(g)(ii)		
<i>November</i>	Post operational monitoring	s 9(2)(g)(ii)		
<i>November</i>	Post operational notification	s 9(2)(a)	See comms plan docm-	

Deliverables

< Provide links to relevant documents >

- Tender documents, s 9(2)(g)(ii) to complete
- Communication plan [DOC-2973569](#)
- DOC application [DOC - 2998138](#)
- Consents, Not Required
- Safety plan To be completed
- Safety briefing, To be completed
- Emergency Response Plan for transport, To be completed
- Emergency Response Plan for storage, To be completed
- Contracts
- Checklist of info required for operational report
- Warning sign register To be completed
- Costings spreadsheet
- Moehau and Papakai Pest Control Document Index [DOC-2973566](#)
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