



# Operational Report for Possum Control in the Abel Tasman National Park/Canaan Scenic Reserve

01 Sep 2008 - 28 Nov 2008

Department of Conservation  
Golden Bay

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# 1. Operation Summary

**Operation Name** Possum in Abel Tasman National Park/Canaan Scenic Reserve

**Operation Date** 01 Sep 2008 - 28 Nov 2008

**Area Office** Golden Bay **Conservancy:** Nelson Marlborough

**Pestlink Reference** 0809GDB03

**Treatment Area** **Size (ha)**

Abel Tasman National Park/Canaan Scenic Reserve 7204.70

Conservation Unit Name(s)	Conservation Unit Number(s)
Abel Tasman National Park	00016
Canaan Downs Scenic Reserve	01253
Abel Tasman Scenic Reserve	01324

## Treatment Block Details

Treatment Blocks	Size (ha)	Grid Ref	GIS Ref
Canaan Ground Control	916.00		
Aerial 1080	6288.70		

**Contractor Name** Coast to Coast Helicopters Ltd and Amuri Helicopters Ltd

Treatment Dates	Start	Completion
Aerial 1080	10 Oct 2008	13 Nov 2008
Canaan Ground Control	01 Sep 2008	28 Nov 2008

## Target Pest Details

Treatment Blocks	Target Pests	Control Method	Name
Aerial 1080		Pesticide Aerial	Pesticide - Aerial in Aerial 1080-(1)
Canaan Ground Control		Pesticide Bait Station	Pesticide - Bait Station in Canaan Ground Control-(1)

## Conservation Outcome(s)

This operation will be undertaken to maintain a viable populations of three species of land snail: *Rhytida o'connori*, *Rhytida greenwoodi* var *webbi* and *Powelliphanta hochstetteri* *hochstetteri* (yellow-based). Forest ecosystem health will be enhanced by the improved condition of canopy and sub-canopy tree species.

Result Target(s)	Treatment Area/Block	What we got
<ul style="list-style-type: none"> <li>To reduce possums within</li> </ul>	Aerial 1080	0.3 +/- 0.7%

the Aerial 1080 operational area to a residual trap catch of less than 1% (<1% RTC) overall immediately following the operation and where no line exceeds 3% RTC

- To reduce possums within the Ground Control operational area to a residual trap catch of less than 1% (<1% RTC) overall immediately following the operation and where no line exceeds 3% RTC
- Canaan Ground Control      1.0% +/- 1.0%

### Outcome Targets

- To increase the average density of *Powelliphanta hochstetteri* (yellow-based) in the permanent snail measuring plots to > 12 live snails/100m<sup>2</sup>
- To achieve and maintain the average foliage cover of a monitored sample of *Podocarpus hallii* plants at Abel Tasman National Park to at least 55%.
- To achieve and maintain the level of browse at Category 0 or 1 for 95% of individual plants of

### What we got

The number of live *P.h.hochstetteri* located in the Canaan plots in 2006 had declined from  $5.7 \pm 2.3$  (95%CI) snails/100m<sup>2</sup> in 2000 to  $3.8 \pm 1.9$  in 2006. Results of 2008 monitoring period due by 30/06/09

The mean foliage cover (%) of 69 monitored trees at Canaan has increased slightly from the 2001 pre-control mean of  $49.4 \pm 3.8$  (95% CI) to  $56.4 \pm 3.6$  in 2008. The percentage incidence of browse (>1) has also declined from to 76.8% in 2001 to 27.9% in 2008. Post-op (2008) monitoring planned for c. 2011 (mid term).

See above

Podocarpus hallii.

- To increase the average density of Rhytida o'connori in the permanent snail measuring plots

Results of 2000-2008  
monitoring period due by  
30/06/09

## 2. Introduction

### 2.1 TREATMENT AREA

#### Non-target species

Common Name	Scientific Name
Kea	Nestor notabilis
Tomtit	Petroica macrocephala
-	Petroica australis
-	Nestor meridionalis
Western Weka	Gallirallus australis australis

#### Target benefit species

Common Name	Scientific Name
Snail	Rhytida greenwoodi webbi
Snail	Rhytida oconnori
Hall's totara	Podocarpus cunninghamii
-	Podocarpus totara
-	Melicytus aff. obovatus (a) (AK 229988; Cook Strait)
-	Libocedrus bidwillii
Scarlet mistletoe	Peraxilla colensoi
Red mistletoe, pikirangi, pirirangi, pikiraki, pirita	Peraxilla tetrapetala
-	Pseudopanax macintyreii
-	Raukahu simplex

#### Threatened species

Common Name	Scientific Name
Large land snail	Powelliphanta hochstetteri hochstetteri yellow based
-	Carex (a) (CHR 395744; Takaka)
-	Coprosma obconica

-	<i>Dracophyllum urvilleanum</i>
-	<i>Myosotis brockiei</i>
Scarlet mistletoe	<i>Peraxilla colensoi</i>
Red mistletoe, pikirangi, pirirangi, pikiraki, pirita	<i>Peraxilla tetrapetala</i>
-	<i>Raukaua edgerleyi</i>
New Zealand skullcap, shovel mint	<i>Scutellaria novae-zelandiae</i>
-	<i>Senecio glaucophyllus</i> subsp. <i>glaucophyllus</i>
-	<i>Sophora longicarinata</i>
Native verbena	<i>Teucrium parvifolium</i>
-	<i>Wahlenbergia matthewsii</i>
New Zealand falcon	<i>Falco novaeseelandiae</i>
Yellow-crowned Parakeet	<i>Cyanoramphus auriceps</i>
Ground beetle	<i>Mecodema costellum obesum</i>
Long-tailed bat (South Island)	<i>Chalinolobus tuberculatus</i> (South Island)

### Geographical location

The Abel Tasman National Park/Canaan Scenic Reserve is situated 10 km East of Takaka.

### TREATMENT BLOCK DETAILS:

<b>Treatment block</b>	Canaan Ground Control	
<b>Vegetation type</b>	The majority of the areas is comprised of exotic pasture grasses currently leased for sheep grazing. At the area boundary and throughout as a forested mosaic, silver beech dominates in pure stands . Much of these stands are accessible to grazing with a highly modified or absent understory. Kanuka and manuka scrub appear on recent fire induced patches and fringes	
<b>Bioclimatic zone</b>	sub-montane	
<b>Climate characteristics:</b>		
<b>Rainfall</b>	2000 mm	
<b>Temperature:</b>	<b>Average Summer</b>	15.0
	<b>Average Winter</b>	8.0
<b>Snow level</b>	- m	
<b>Altitude</b>	740-1080 m	
<b>Community and Iwi interests</b>	The Canaan Road provides access to the Canaan Downs Scenic Reserve and the characteristic karst geology of the area particularly Harwood's Hole. A DOC campground is located at the track start. The Rameka Track extends from the end of the Canaan Rd and enters the lower Takaka valley at Rameka Creek and is a popular route for mountain bikers. Other mountain bike	

	trails are being developed throughout the leased farmland areas of Canaan S.R. Iwi consider the cave systems as wahi tapu and Harwoods Hole is of great significance to tangata whenua.
<b>Historic sites</b>	No known Maori or early European sites of occupation are known to be in the operational area.
<b>Treatment block</b>	Aerial 1080
<b>Vegetation type</b>	The coastal vegetation is characterised by lush gully forests with nikau and puketea, kanuka forests, manuka scrub and mahoe with ngaio and akeake on the coastal fringe. Extensive areas are undergoing progressive regeneration through various seral stages. The main vegetation types of the interior are lowland forest of mixed podocarps, beech and broadleaved species, especially rimu, hard beech, totara, pigeonwood and mahoe. Kiekie and nikau are common in the gullies. Higher altitude red beech dominates in deep soils, giving way to silver beech at less fertile sites with mountain beech occurring in pure stands on ridges. The highest and coolest part of the interior of the operational area support mountain beech, silver beech, mountain cedar and southern rata. At Moa Park infertile soils, poor drainage and cold climate have resulted in red tussock lands including mossfields, bog pine, Hebe spp. and alpine herbs.
<b>Bioclimatic zone</b>	lowland sub-montane semi-coastal
<b>Climate characteristics:</b>	
<b>Rainfall</b>	1500 mm
<b>Temperature:</b>	<b>Average Summer</b> 15.0 <b>Average Winter</b> 10.0
<b>Snow level</b>	- m
<b>Altitude</b>	10-1100 m
<b>Community and Iwi interests</b>	Abel Tasman National Park is one of the most popular outdoor recreational destinations in New Zealand. However, approximately 95% of park use is confined to within 500m of the coastline and use is highly seasonal. The interior of the park is largely unmodified and tracks are less developed compared to the coastal regions. Visitor use is relatively low, particularly in the winter months and visitors are primarily more experienced trampers. The Canaan Road provides access to the Canaan Downs Scenic Reserve and the characteristic karst geology of the area. Harwood's Hole is the primary focus of day visits and usage is about 2000 people per annum although the majority of use is during the summer months. The Rameka Track extends from the end of the Canaan Rd and enters the lower Takaka valley at Rameka Creek and is a popular route for mountain bikers. Iwi consider the entire Abel Tasman NP to be waahi tapu, particularly the caves. Occupation was mainly confined to the

	coastal regions
<b>Historic sites</b>	All known Maori and European occupation sites and urupa sites are located at the coastal areas just outside the operational area.

## 2.2 MANAGEMENT HISTORY

Management history was not chosen to be shown in this operational report. This history is, however, available via Pestlink

# 3 Outcomes and Targets

## 3.1 CONSERVATION OUTCOMES

This operation will be undertaken to maintain a viable populations of three species of land snail: *Rhytida o'connori*, *Rhytida greenwoodi* var *webbi* and *Powelliphanta hochstetteri* *hochstetteri* (yellow-based). Forest ecosystem health will be enhanced by the improved condition of canopy and sub-canopy tree species.

## 3.2 TARGETS

### 3.2.1 Result Targets

The result targets for the treatment area were:

- To reduce possums within the Aerial 1080 operational area to a residual trap catch of less than 1% (<1% RTC) overall immediately following the operation and where no line exceeds 3% RTC
- To reduce possums within the Ground Control operational area to a residual trap catch of less than 1% (<1% RTC) overall immediately following the operation and where no line exceeds 3% RTC

### 3.2.2 Outcome Targets

The outcome targets for the treatment area were:

- • To increase the average density of *Powelliphanta hochstetteri* *hochstetteri* (yellow-based) in the permanent snail measuring plots to > 12 live snails/100m<sup>2</sup>
- • To achieve and maintain the average foliage cover of a monitored sample of *Podocarpus hallii* plants at Abel Tasman National Park to at least 55%.
- • To achieve and maintain the level of browse at Category 0 or 1 for 95% of individual plants of *Podocarpus hallii*.
- To increase the average density of *Rhytida o'connori* in the permanent snail measuring plots

# 4 Consultation, Consents & Notifications

## 4.1 CONSULTATION

Extensive consultation was undertaken throughout a 16-month operational planning phase beginning in 14/08/07. A total of 145 parties participated in the consultation process including:

1. Adjoining landowners
2. Affected landowners
3. Public Health Service (Office of Medical Officer of Health);
4. Tasman District Council
5. NZDA
6. Iwi
7. Fish and Game council
8. Fur Recovery operators
9. Community interest groups (Residents Associations, Royal Forest and Bird Protection Society, Tramping clubs)
10. Concessionaires

As the operational area is effectively surrounded on all sides by relatively densely populated areas (notably in Takaka Valley) a large number of directly adjacent and proximate landowners were consulted. The current operation inherited the full consultation list of the parent separate operations from 2001 and 2003. The initial step was to visit each party where possible to describe the previous operations (area/methods/outcomes etc) and gain an understanding of opinions.

Refer also to:

DOCDM-193363. Assessment of Environmental Effects for Possum Control in the Abel Tasman National Park/Canaan Downs Scenic Reserve, 2008, Appendix 3 Consultation Record

DOCDM-181753 Abel Tasman National Park/Canaan Downs Scenic Reserve, 2008, Communication Plan

DOCDM-214606. Abel Tasman National Park/Canaan Downs Scenic Reserve, 2008MOH Application

### Consultation outcomes

As a result of the first round of consultation, a proposal was developed by Jan 2008 that attempted to meet as many objectives as possible (conservation outcomes, community concerns/aspirations). The most significant outcome was the removal of the northern ATNP from the operation. This area was variously treated in 2003 by using hand-laid 1080 techniques or not controlled at all. A prominent comment by a majority of consulted parties was for the increased resource use of possums. Therefore an opportunity was provided for possum trapping for commercial fur recovery over an area of around 4000 hectares of the northern coastal region of the national park to link in



with the DOC possum control. This area is the most accessible and utilised area for commercial fur recovery and the plant species present are the most tolerant and resilient to low/mid level possum densities. The risk of the failure of commercial operators to maintain possums at levels below species protection thresholds was considered justifiable for the gains in public support for the remainder of the operation. Landowners affected by the inclusion of the entire Gorge Creek catchment required particular consideration, particularly if they abstracted water from the Creek for domestic consumption. Agreement with these 10 landowners was considered a priority; particularly due to the events of the 2001 operation (destruction of bait by protestors associated with some of these landowners and suspected deliberate emptying of supplied alternative water). Agreement was reached in conjunction with MOH to provide alternative water at a maximum level of consumption/household/day (100 lt) until negative results from water tests at 48 hrs and after 50mm of recorded rainfall). The operation was severely compromised at the latter stages by the sale of a critical block of private land located entirely within the proposed operational area boundaries (surrounded by ATNP). This block was purchased by people resident overseas who objected to the control of possums in any form. Discussion and opportunities on reaching a decision which may have satisfied both parties (DOC and landowners) was severely inhibited by the difficulties in direct and frequent communication. As a result, the area was removed from either the aerial or ground treatment blocks. Communication will be maintained with these landowners in an attempt to emphasise the significance of possum impacts and the strategic location of their land. Apart from commercial fur recovery operators whose operations were predominately confined to the northern and boundary areas, no other party or community interest group expressed significant concern. A representative of the since defunct Golden Bay Anti 1080 group was visited at the initial consultation stages in which they still expressed concern about the contamination of the karst hydrological systems. After the original proposal was distributed to neighbouring landowners in Feb 2008, several adjacent landowners requested that their block be included in the aerial control area. This was agreed to where it did not affect catchments or areas which had been specifically excluded to alleviate other landowner concerns.

### **Lessons learned**

At the initial contact with the critical parties involved (landowners, interested [anti 1080 use, fur recovery operators] parties, no specific proposal or range of proposals was offered for consideration. Instead, the previous control history was discussed as well as the rationale for some form/extent of future control. This approach indicated that DOC had not already devised a limited range of available options and not that the consultation process was seen as merely gaining approval, or perhaps only for slightly modifying a preferred option. Although the consultation process was initiated 16 months ahead of the scheduled operation date, numerous changes in circumstances (property ownership, private and personal health concerns) meant that the final proposal was not finally developed and formally proposed for consent until only several months in advance. Where consent/permission by required by certain parties, signed consent should be obtained as early as possible in order to alleviate last minute changes to the proposal.

## **4.2 CONSENTS**

<b>Consent</b>	<b>Consent date</b>	<b>File/DME reference</b>
Medical Officer of Health	15/08/2008	refer NHT-02-16-812
Resource Consent -Discharge	05/09/2008	RM080652
Dept of Conservation	01/09/2008	refer NHT-02-16-812

### Lessons learned

Where required, landowner consent was obtained at an early stage (10 months prior) using the Standard DOC Letter of Landowner/Occupier Permission. However, at a late stage in the resource consent application process, the issuing authority (TDC) required that all affected parties sign the TDC form. This had not been a requirement in all previous operations. In future, all parties should be sent this form (in addition to the DOC form with the poison and delivery methods clearly stated) with a map of the proposed area for viewing and signing. This would alleviate any potential dispute about areas referred to.

### 4.3 NOTIFICATION

Notification of the final proposal and operational planning was undertaken immediately (10/09/08) following the receipt of all consents. This comprised of letters and Key Facts Sheets sent to *c.80* affected and /or interested parties. Notified parties comprised all parties included in the Consultation process listed above in addition to:

11. All information outlets
12. Medical and veterinary practitioners
13. Wild animal recovery operators/processors
14. Schools and child care centres
15. Police

Public notification was undertaken by advertising the operation in three regional and local newspapers. 24 hr notification of 46 identified critical parties was conducted to specifically inform of the operation.

Refer also to:

DOC DM-1933663. *Assessment of Environmental Effects for Possum Control in the Abel Tasman National Park/Canaan Downs Scenic Reserve 2008 Appendix 3 Notification Record*

DOC DM-181753. *Abel Tasman National Park/Canaan Downs Scenic Reserve 2008 Communication Plan*

DOC DM-214606. *Abel Tasman National Park/Canaan Downs Scenic Reserve 2008 MOH Application*

### Lessons learned

Advisory notices at the start of tracks leading into the core aerial control area advised track users that the operation was imminent and that the track could be closed at short notice for an imprecisely known period. Notices were placed immediately after the prefeed operation to inform users of the nature of the baits on the tracks and alleviate any concerns about these pellets being toxic. An advance Harwoods Hole track closed sign was erected at the SH60 turnoff on the morning of the aerial 1080 operation to alert possible visitors of the track closure. This was considered to be an elementary attempt to inform track users who could be inconvenienced by the operation (specifically track closure) and who did not access any of the other public notification processes.

# 5 Methods

## 5.1 TARGET SPECIES

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### Treatment Block Aerial 1080

Control method	Name	Target pest species
Pesticide - Aerial	Pesticide - Aerial in Aerial 1080-(1)	Possum

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Treatment Block	Control Method	Name	Target Pest Species
Aerial 1080	Pesticide - Aerial	Pesticide - Aerial in Aerial 1080-(1)	Possum
<b>Trade name of pesticide</b>	0.15% 1080 Pellets		
<b>Name of pesticide</b>	Sodium fluoroacetate (1080)		
<b>Type of bait</b>	Cereal pellet		
<b>Toxic loading</b>	1.5 g/kg		
<b>Bait quality sampling</b>	Conducted		

#### Bait Details

	Pre-feed	Toxic
<b>Bait type</b>	Pollard/pellet	Cereal pellet
<b>Lure/mask/deterrent</b>	Cinnamon	Cinnamon
<b>Lure/mask/deterrent</b>	0.15%	0.30%
<b>Dye</b>	None	Green
<b>Individual Bait Weight</b>	12.0g	12.0g

#### Sowing Rate Details

Pre-feed			Toxic		
Date	Rate(kg/ha)	Wind Speed Direction	Date	Rate(kg/ha)	Wind Speed Direction
10/10/2008	1.00	Calm SW	12/11/2008	2.00	Calm NE
11/10/2008	1.00	Moderate SW	13/11/2008	2.00	Calm NE
12/10/2008	1.00	Calm SW			

<b>Time between pre-feed and toxic</b>	31
<b>End of Caution Period Date</b>	13/05/2008
<b>Aircraft type</b>	Robinson R44 Squirrel AS 350

**Number of Aircraft** 3

**Sowing gear details**

Description	Capacity
AS350: Specialized pellet spreader with independant spreader motor. 130m swath width. Retractable legs	850 kg
R44:AS350: Specialized pellet spreader with independant spreader motor. 120m swath width. Non-retractable legs. Bucket capacity 250kg	

**Type of navigational guidance system used** AS350: Trimflight 3 R44: UTS GPS

**Loading Method** R44: A rigid pre-loading hopper (capacity c 400kg) suspended by Hiab on the helicopter contractor support truck. Pre-loading hopper load emptied into sowing bucket on hover. AS350: Bucket disconnected and helicopter lands at refuelling site. Baits

**Complaints and Incidents**

Sunday 16/11/2008 A member of the public took a dog into the operational area at the Harwoods Hole track. The dog apparently ingested a bait on the track and subsequently died. The owners acknowledged that they had seen the 1080 warning sign located at the track entrance but did not consider it relevant. The owners also ignored the two signs on the Canaan Road leading to the Harwoods Hole track start that clearly indicate that dogs are prohibited in the Scenic Reserve at the start of the track.. Harwoods Hole is located in the Abel Tasman N.P. in which dogs are prohibited Monday 17 November 2008 Phone communication from the dog's owners to Golden Bay Area Manager that the dog had died and claiming that this was a result of the dog eating 1080 and that baits were still present on the track. Copies of MOH and Resource Consent conditions were supplied on request. Health Protection Officer (Nelson) notified of the incident. A Department of Conservation staff member conducted a track inspection on Monday morning and removed 8 bait fragments from the total length of the track and up to 2 m either side. The Health Protection Officer from the Nelson Marlborough District Health Board revisited the area to inspect pellet density on and adjacent to the track. HPO was satisfied that the number of baits that were detected were within the acceptable limits of feasible clearance for public health protection purposes and complied with the consent. Refer DOCDM-372677 "Abel Tasman 2008 1080 dog poisoning filenote" for full details

**Other Details about this method**

Area (ha) stated above is the effective Operational Area size. Consented area is 7254 ha. Prefeed: 10/10/08 (with 2 x R44) multiple bucket and helicopter engine malfunctions resulted in 1550 kg applied. 11/10/08 with 1 x R 44 and AS350. 3900kg applied before excessive wind stopped the operation. Completed 12/10/08 with 2 x R44. Toxic: 12/11/08 (2 x R44, 1x AS350).

13200 kg sown with remainder retained for Gorge Creek area which was covered in low inversion cloud throughout Day 1. 13/11/08 Completion of 1800 kg in Gorge Creek area using 1x R44. .

### **Deviations from planned operation**

Prefeed: 10/10/08 (with 2 x R44) multiple bucket and helicopter engine malfunctions resulted in 1550 kg applied. 11/10/08 with 1 x R 44 and AS350. 3900kg applied before excessive wind stopped the operation. Completed 12/10/08 with 2 x R44. Toxic:

### **Lessons Learned**

The possible limitations of efficiency of some of the gear (sowing equipment/GPS) resulting from granting the contract to a comparatively a smaller operator who undertakes less 1080 operations compared to other tenderers was considered at the tender evaluation. However, this was countered by the local base of the aerial contractor, extensive local familiarity of the area / weather conditions and previous 1080 contracts with the GB Area. Due to the presence of highly sensitive boundaries and the potential for significant public/media criticism if any over flight occurred, the selection of a local operator who recognized these concerns was warranted and a significant benefit. Initial concerns about the capacity and effectiveness of R44 for 1080 operations were substantially confirmed. Although very useful for low cost (and therefore comprehensive) boundary checks, the low power availability meant the intricate boundaries around the steeply gorged terrain of some areas was extremely difficult to fly/sow. A briefing document was produced and provided to the pilots several weeks prior which described all the significant issues (boundaries, consent conditions, preferred operational schedule etc). This was of great value as a basis for pilot/manager discussion to ensure that all pilots were aware of important issues. Review of track bait clearance regime at high use tracks to consider additional checks in excess of consent requirements

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## **Treatment Block Canaan Ground Control**

<b>Control method</b>	<b>Name</b>	<b>Target pest species</b>
Pesticide - Bait Station	Pesticide - Bait Station in Canaan Ground Control- (1)	Possum

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<b>Treatment Block</b>	<b>Control Method</b>	<b>Name</b>	<b>Target Pest Species</b>
Canaan Ground Control	Pesticide - Bait Station	Pesticide - Bait Station in Canaan Ground Control-(1)	Possum
<b>Trade name of</b>	Feratox (encaps pellet with prefeed)		

pesticide	paste)
Name of pesticide	Cyanide
Type of bait	Encapsulated pellet with prefeed paste
Toxic loading	475 g/kg
Bait quality sampling	Not Conducted

**Bait Details**

	<b>Pre-feed</b>	<b>Toxic</b>
<b>Bait type</b>	Paste	Encapsulated pellet with prefeed paste
<b>Lure/mask/deterrent</b>	Peanut Butter	Peanut Butter
<b>Lure/mask/deterrent</b>	0%	0%
<b>Dye</b>	None	None
<b>Individual Bait Weight</b>	20.0g	20.0g

**Treatment details**

	<b>Pre-feed</b>	<b>Toxic</b>
<b>Dates</b>	01/09/2008	28/10/2008
<b>No. of fills</b>	1	1
<b>How long to fill</b>	5.00	5.00
<b>Average fill frequency</b>	0	0
<b>Quantity when filled</b>	0	1

<b>Time between pre-feed and toxic</b>	52
<b>Date Bait Removed</b>	28/11/2008
<b>End of Caution Period Date</b>	28/01/2009
<b>Pattern of bait stations</b>	Grid Perimeter Other
<b>Bait station spacing</b>	100m between lines X 25m between bait stations
<b>Total number of bait stations</b>	2000
<b>Bait station density</b>	2.1834
<b>Bait station type</b>	Bait bags - paper

**Other Details about this method**

The size of the operational area (916ha) describes the entire consented area. The majority of this area is stocked pasture-land. The effective treatment area of forested/regenerating habitat is estimated at c 350 ha only. Lines in internal forested areas followed bush/pasture margins with internal lines for effective 100m spacing if required/appropriate. Time to deploy the toxic =5 days. Completed 31/10/08

**Deviations from planned operation**

Initial toxic deployment of c. 400 Feratox baits started eight days after the prefeed. However, a preliminary assessment of prefeed bait take during this part of the operation indicated that there was inadequate prefeed consumption to warrant toxic bait deployment. This was possibly due to the intervening period of heavy and persistent rain. The 400 Feratox baits were retrieved after 10 days to comply with consent conditions of no bait permitted during school holidays. Feratox deployment recommenced at the first opportunity on 28 Oct with all lines revisited. On some internal lines where prefeed bait take was low, the distance between Feratox baits was increased from 25 m to 50 m. This was to compensate for the reduced number of baits due to c. 400 baits previously deployed and retrieved. A 2nd bait fill was undertaken at a small length of the NE boundary with the aerial block where a high kill % was recorded.

**Lessons Learned**

The initial apparent absence of possums (non existent/low prefeed bait take) that was noted after the first 10 day period extended up to 20 days in parts of the block. However, the Feratox bait take and kill rate was eventually still high in these areas. The two previous Feratox operations may have created some level of bait aversion which need extra prefeed deployment time to overcome. GPS locations of ALL baits was recorded/mapped and a system to document the pattern of bait take was employed (both prefeed and toxic). This was very useful in graphically displaying high bait interference/ kill areas where additional control could be targeted

**5.2 ENVIRONMENTAL EFFECTS**

**5.2.1 Effects on Non-Target Species**

Effects are discussed in detail in Sections 5.3, 5.4 and 5.7 of the AEE (DOCDM 193363)

Performance standard(s)	Followed ?	Monitored ?
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DOC Performance Standards: 1080 baits used must have a mean weight of more than 6 grams and 95% of baits must have weight not less than 4grams.	Yes	Yes
Resource Consent Condition 5 that 1080 concentration of 1080 in baits should not exceed 0.15 % w/w	Yes	Yes
Resource Consent Condition 5 that application of baits should not exceed 4kg/ha.	Yes	No

### 5.2.2 Effects on Soil and Water Quality

Effects are discussed in detail in Section 5.2 and Appendix 2 of the AEE. Refer AEE Section 5.2.1 for mitigation procedures.

Performance standard(s)	Followed ?	Monitored ?
The operational area will avoid water bodies as identified by the MOH with an aerial exclusion zone of 50m maintained on both sides of these watercourses	Yes	Yes
No contamination of public water supply	Yes	Yes
Flight paths within the operational area have been selected to avoid flying over water supplies.	Yes	Yes
No baits will be aerially laid within 150m of all mapped water intakes, huts, campgrounds and other facilities with potable water supplies as identified in AEE Section 3.7.	Yes	Yes
No cyanide baits will be hand-laid within 50m of water supply intake	Yes	Yes
The water supplies for all potable water supplies as identified in Section 3.7 shall be disconnected and/or alternative water for direct human consumption supplied until the relevant conditions stipulated in the MOH Consent have been met	Yes	Yes
All landowners with water supplies originating in the control area will be given 24hrs notice of the operation in order that they can disconnect water supplies and/or fill storage tanks.	Yes	Yes

### 5.2.3 Effects on Ecosystems

Effects are discussed in detail in Section 5.7 of the AEE (DOCDM 193363)

Performance standard(s)	Followed ?	Monitored ?
AEE Section 5.7.1	N/A	N/A

### 5.2.4 Effects on Human Health

Effects are discussed in detail in Section 5.5 of the AEE (DOCDM 193363)

Performance standard(s)	Followed ?	Monitored ?
Refer AEE Section 5.5.1	Yes	Yes

## 6 Monitoring Results and Outcomes

### 6.1 RESULT MONITORING - TARGET SPECIES

#### Result target(s)



To reduce possums within the Aerial 1080 operational area to a residual trap catch of less than 1% (<1% RTC) overall immediately following the operation and where no line exceeds 3% RTC

To reduce possums within the Ground Control operational area to a residual trap catch of less than 1% (<1% RTC) overall immediately following the operation and where no line exceeds 3% RTC

### 6.1.1 Target Species Monitoring Residual trap-catch index (RTCI)

**Method:**

**Species monitored** Possum - *Trichosurus vulpecula* in Aerial 1080

**Monitor method details**

Standard RTC protocol with raised sets. Treatment areas defined as:  
Aerial 1080: Either Aerial 1080 or ground control in 2001, Aerial 1080 in 2003 or previously untreated AND aerial 1080 in 2008

**Deviations**

Nil

**Target pest result details**

	Pre	During/Post
<b>Monitoring dates</b>	24/7/07-21/9/07	26/01/09-3/02/09
<b>Results</b>	8.6 +/- 2.6 %	0.3 +/- 0.7%

**Result target met?** Yes

**Lessons Learned**

Nil

### 6.1.2 Target Species Monitoring Residual trap-catch index (RTCI)

**Method:**

**Species monitored** Possum - *Trichosurus vulpecula* in Canaan Ground Control

**Monitor method details**

Standard RTC protocol with raised sets. Treatment areas defined as:  
Canaan Ground Control: Partial Ground Control in 2001, 2005 AND Ground Control in 2008.

**Deviations**

NIL

**Target pest result details**

	Pre	During/Post
<b>Monitoring dates</b>	N/A	26/01/09-3/02/09
<b>Results</b>	N/A	1.0% +/- 1.0%

**Result target met?** Yes

**Lessons Learned**

NIL

## 6.2 RESULT MONITORING - ENVIRONMENTAL EFFECTS

### 6.2.1 Non Target Species

**Monitoring of:** Non-target native birds

#### Monitor Method details

Informal, haphazard search along formal walking tracks through the aerial 1080 operational area as a part of the track clearance programme. Limited off-track search conducted by DOC staff undertaking other tasks in a part of the operational area. Total search time= c. 30pers/hrs Members of the Golden Bay community with a concern about 1080 use also conducted searches for native non-target bird kill at various sites throughout the aerial 1080 block. No reports of dead birds were made.

#### Deviations

NIL.

**Monitoring dates** 13/11/08 to 19/11/08

**Results** One chaffinch located by DOC staff 6 days after the 1080 operation with a half-laid egg. Cause of death could have been due to difficulties in egg-laying and no 1080 test was conducted.

#### Lessons Learned

NIL

#### Effectiveness of performance standards

Manufacturer (ACP) testing of bait size, hardness and toxic loading conducted and results filed. All complied with standards. No standard protocol on bait distribution/density assessment. Based largely on end operation % cover assessed by visual inspection of GPS screen and GIS mapping printouts and total bait application.

### 6.2.2 Soil and Water Quality

**Monitoring of:** 1080 residue in public water supply catchment.  
Gorge Creek water scheme intake

#### Monitor Method details

Landcare Research 1080 water sampling protocols [www.landcareresearch.co.nz/services/laboratories/toxlab/protocol\\_water.asp](http://www.landcareresearch.co.nz/services/laboratories/toxlab/protocol_water.asp). Sample taken by an independent water monitor conducted on 15/11/08 after 48 hrs (MOH Condition 24) and again on 19/11/08 after >50mm of rainfall recorded at TDC monitoring gauge in accordance with an agreement with the water scheme members

#### Deviations

NIL

**Monitoring dates** 15/11/08, 19/11/08

**Results** Both samples: Less than MDL

#### Lessons Learned

Contracting the water sampling to an independent contractor cost c. \$500 additional to the LCR test results due a single sample visit.. This was based on the experience from the 2001 operation when there was considerable objection and protest action taken by these landowners. Their possible reactions in 2008 were unknown. As a result of the

consultation process and negotiated water supply agreement, no objection was raised and no challenge to the negative test results eventuated. However, given the potential for the dispute of results if a non independent (DOC) monitor had been used, this expense was considered warranted and should be used in similar, possible contentious situations

#### **Effectiveness of performance standards**

Maintenance of buffer zones at the Gorge Creek exclusion zone verified by a staff observer present at the Gorge Creek water intake during the toxic sowing operation. Site inspection also followed the prefeed application to check if any bait was applied in the exclusion zone. None detected. Visual inspection of both the prefeed and toxic GPS screen and printout. GPS mapping of cyanide bait placement ensured compliance. 24 hour notification record of all affected parties maintained and notification actions documented. Water contamination of public water supply independently tested according to MOH condition. Negative test result obtained (< MDL).

#### **6.2.3 Ecosystems**

No monitoring of ecosystems was undertaken.

#### **6.2.4 Human Health**

**Monitoring of:** **Flight path of helicopter**

##### **Monitor Method details**

The "as sown" helicopter GPS unit was scrutinized at several points during the operation to check that sensitive boundaries with water supplies, exclusion zones and water supply catchments had been avoided. On-site mapping using GIS support verified and documented flight paths

##### **Deviations**

Nil.

**Monitoring dates** 12/11/08, 13/11/08

**Results** Visual screen check and secondary mapping showed that the boundaries had been maintained and no overflight of water catchment boundaries had occurred.

##### **Lessons Learned**

Presence of on-site GIS staff capable on immediate downloading and presentation of flight data critical in aiding assurance of accuracy of operation and immediate recognition of any issues (over-flights or gaps)

#### **Effectiveness of performance standards**

No reports of any health issues were received.

### **6.3 OUTCOME MONITORING**

#### **Outcome targets**

- To increase the average density of *Powelliphanta hochstetteri hochstetteri* (yellow-based) in the permanent snail measuring plots to > 12 live snails/100m<sup>2</sup>
- To achieve and maintain the average foliage cover of a monitored sample of *Podocarpus hallii* plants at Abel Tasman National Park to at least 55%.

- To achieve and maintain the level of browse at Category 0 or 1 for 95% of individual plants of *Podocarpus hallii*.

To increase the average density of *Rhytida o'connori* in the permanent snail measuring plots

**6.3.1 Outcome monitoring :** **Large land snail - *Powelliphanta hochstetteri hochstetteri* yellow based**

**Monitoring Method(s)** Foliar browse index (FBI)  
Snail plots (permanent)

**Monitoring information due date** 2011

**Method details** Thirteen 100m<sup>2</sup> and eight 25m<sup>2</sup> permanent snail monitoring plots established variously since 2000 will be re-measured in 2010/11 following standard snail monitoring protocols (K Walker)

**Monitoring dates**

**Outcome Results**

The number of live *P.h.hochstetteri* located in the Canaan plots in 2006 had declined from  $5.7 \pm 2.3$  (95%CI) snails/100m<sup>2</sup> in 2000 to  $3.8 \pm 1.9$  in 2006. Results of 2008 monitoring period due by 30/06/09

**Outcome target met?** Monitoring incomplete

**Lessons Learned**

NIL

**6.3.2 Outcome monitoring :** **Hall's totara - *Podocarpus cunninghamii***

**Monitoring Method(s)**

**Monitoring information due date** 30/06/10

**Method details** Foliar Browse Index (Payton et al) on 69 trees monitored since 2001

**Monitoring dates**

**Outcome Results**

The mean foliage cover (%) of 69 monitored trees at Canaan has increased slightly from the 2001 pre-control mean of  $49.4 \pm 3.8$  (95% CI) to  $56.4 \pm 3.6$  in 2008. The percentage incidence of browse (>1) has also declined from to 76.8% in 2001 to 27.9% in 2008. Post-op (2008) monitoring planned for c. 2011 (mid term).

**Outcome target met?** Monitoring ongoing

**Lessons Learned**

NIL

**6.3.3 Outcome monitoring :** **Hall's totara - *Podocarpus cunninghamii***

**Monitoring Method(s)****Monitoring information due date**

30/06/10

**Method details**

Foliar Browse Index (Payton et al) on 69 trees monitored since 2001

**Monitoring dates****Outcome Results**

See above

**Outcome target met?**

Monitoring ongoing

**Lessons Learned**

Nil

**6.3.4 Outcome monitoring :****Snail - Rhytida oconnori****Monitoring Method(s)****Monitoring information due date**

2011

**Method details**Thirteen 100m<sup>2</sup> and eight 25m<sup>2</sup> permanent snail monitoring plots established variously since 2000 will be re-measured in 2010/11 following standard snail monitoring protocols (K Walker)**Monitoring dates****Outcome Results**

Results of 2000-2008 monitoring period due by 30/06/09

**Outcome target met?**

Monitoring incomplete

**Lessons Learned**

Nil