Application Form for Rat and Possum control in the Upper and Lower Hollyford Area (version 2)

September 2019

Name of applicant: s 9(2)(a) [redacted]

Company/organisation: EcoFX Ltd

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Prepared by: s 9(2)(a) [redacted], ph. 07 873 8130, 11/09/2019

CONTENTS

1. Introduction

1.1 Overview

To control rats and possums (with a by-kill of stoats) in the Hollyford Area following a rat irruption triggered by a beech mast event, it is proposed that the following pesticide uses will be applied:

- Pesticide Use 1 Sodium fluoroacetate 1.5g/kg Cereal Pellet Aerial
- Pesticide Use 2 Sodium fluoroacetate 1.5g/kg Cereal Pellet Hand Broadcast
- Pesticide Use (140) Sodium fluoroacetate 1.5g/kg Cereal pellet Aerial (Pestex)
- Pesticide Use (141) Sodium fluoroacetate 1.5g/kg Cereal pellet Hand laying (Pestex)

Permission is sought for toxic application starting on or after 9/10/2019 and ending on or before 1/5/2020. Non-toxic prefeed will be applied no earlier than 9/10/2019.

1.2 Treatment area

The Upper and the Lower Hollyford blocks - a total consent area of 70933 ha comprising:

Public Conservation Land

- 12267.6 ha of the Pyke Forest Conservation Area, a Stewardship Area under Section 25 of the Conservation Act 1987
- 57598 ha of the Fiordland National Park, a National Park under the National Parks Act 1980

Other land tenure

- 291.7 ha of Legal Roads (Southland District Council)
- 443.3 ha of land administered by Land Information New Zealand
- 295 ha of Private Freehold

1.3 Treatment block(s)

The treated area has two treatment blocks – Upper Hollyford and Lower Hollyford.

1.4 Geographical location

The Hollyford Valley is in the south west of the South Island. The Hollyford River runs north west from the Southern Alps through the valley to the Tasman Sea. The area is accessed only via the Milford Road and tramping tracks.

	Milford Sound is approximately 10 km west north west from the closest boundary (Moraine Creek). Te Anau is approximately 84km South on SH94 from the Southern boundary of the operation (The Divide). It includes both sides of the Hollyford Valley until it reaches the Tasman Sea. It follows the Pyke River down as far as the swing bridge on the Hollyford tack. This includes both sides of The Milford Te Anau Highway (94) from the Divide to the Monkey Creek Carpark.
1.5 Adjacent land tenure and uses	• Public Conservation Land: Fiordland National Park and Pyke Forest. • Private residential land. • SH94 managed by NZTA. • Hollyford Road managed by Southland District Council SDC, upper Hollyford block.
1.6 Nearby residential areas or facilities	**Te Anau township** Te Anau township lies approximately 84km south of the southern boundary of the operation. **Milford Sound village** Milford Sound village is approximately 10km away (direct line) from Upper Hollyford, or 20km along SH94. **Lower Hollyford** Private landowners in the Lower Hollyford treatment area are in • Jamestown • Martins Bay • Big Bay **Private land receiving treatment:** Gunns Camp in the Upper Hollyford and 17 private properties within the Lower Hollyford are directly affected by aerial control. Permissions have been obtained from 16 of 18 landowners prior to aerial control taking place. If landowners/occupiers in the contract area have not had previous exposure to large-scale aerial control operations using toxins, they will be provided with comprehensive information.
1.7 Community	The Hollyford River flows west from the Fiordland mountains to the sea. Scenery ranges from glacier-carved mountains

interests

near the Homer Tunnel, to riverside forest to Lake McKerrow, wetlands to the coast at Martins Bay. The area is popular for day walks and longer tramps at numerous huts. Hunting, fishing, rock climbing, mountain biking and boating are common.

Roads

The southernmost section of the Upper Hollyford block incorporates a section of the Te Anau Milford Highway (94) including several pull-over areas, viewing areas and laybys e.g. Monkey Creek carpark/viewpoint and Lake Marian carpark. These areas which are popular with the approx. 1 million tourists that visit per annum (2019). Road access to the loading site at [redacted] is via Hollyford Road, which is a public road off the Milford road (SH94) managed by the Milford Road Alliance.

s 6(d), 9(2)(g)(ii)

During winter the road to the Upper Hollyford and Milford Sound may be closed due to rock fall and avalanche risk.

Medium-high Public Use Tracks

- Lake Marian Track
- Humboldt Falls Track

Medium Public Use Tracks

- the first few kilometres of the Hollyford Track
- The Divide to Lake Howden hut section of the Routeburn Track

Low Public Use Tracks

- the remainder of the Hollyford track from Pyke River Lodge to the north
- the remainder of the Routeburn Track
- Falls Creek Route
- Pass Creek Track
- Deadman's Track
- Morraine Creek Track
- Martins Bay Hut to Big Bay Hut Track

The Routeburn Track from Lake Howden hut heading toward Lake Mackenzie and the Harris Saddle have avalanche risks.

High Public Use Shelters

- Humboldt Falls shelter
- Lake Howden hut
- The Divide shelter

High Public Use Camping areas

- Gunns Camp

Low Public Use Huts

- Martins Bay Hut
- Hokuri Hut
- Demon Trail Hut
- McKerrow Island Hut
- Hidden Falls Hut
- Lake Mackenzie Hut

Huts on the Routeburn track will be unmanned as it is outside of the Great Walks season**.**

Low Use Private Lodge and Huts

- Lake MacKenzie Lodge (Ultimate Walks)
- Sunshine Hut (Guided Walks NZ)
- Pyke River Lodge (Guided Walks NZ)
- Martins Bay Lodge (Guided Walks NZ)

A maintenance crew will be stationed at Martins Bay Lodge and Pyke River Lodge for a 6-week period over the winter and will be informed of the operation.

Hunting and fishing

Due to accessibility, commercial possum skin and fur recovery is popular for many hunters in this area. The area is open to commercial venison recovery - Wild Animal Recovery Operations (WARO). Hunters/anglers target red deer, chamois, possums, trout and inanga/whitebait (seasonally).

Other recreational use

Guided walks

- Ngai Tahu Tourism owns and operates Hollyford Guided Walks and the Pyke River Lodge.
- Ultimate Hikes – a privately-owned commercial guiding operation – runs a guided tramping service through the Routeburn Track. The company manages the Lake Mackenzie Lodge.

Aviation

There are a number of commercial organisations that provide scenic flights or transport for recreational purposes to remote parts of Fiordland.

1.8 Management history

Aerial predator control

- Aerial 1080 was applied to the Lower Hollyford treatment area by DOC during Spring 2014 as part of

the Battle for Our Birds programme (Pestlink reference: 1314TEA06)
- Aerial 1080 was applied to the Upper and Lower Hollyford treatment area by DOC during Spring 2017 as part of the Battle for Our Birds programme (Pestlink reference: 1718TEA01)

Ground predator control

- Approximately 2600ha of the Lower Hollyford is trapped by the Hollyford Conservation Trust to target rats, stoats and possums since 2014.
- Approximately 3500ha of the Upper Hollyford block is trapped as part of the Air New Zealand Great Walks Programme since 2015. This network targets stoats and is managed by DOC. DOC employs contractors to complete the trapping.

2. Outcomes and targets

2.1 Conservation outcome(s)

The Hollyford valley is dominated by beech forest which provides habitat for long-tailed bats, kākā, kea, mohua (yellowhead), kererū and New Zealand falcon. Wetland and scrub provide habitat for fernbirds and bittern. Alpine areas provide habitat for rock wren. Several native fish species migrate annually up the river. The following lizard species have been noted in the upper Hollyford.

- Taumaka skink *Oligosoma taumakae* (Homer Saddle)
- Barrier Skink *Oligosoma sp. 'Barrier'* (Gertrude Saddle)

It is likely that lizard species may still be present in the Lower Hollyford Valley.

Beech seed production for 2019 is predicted to be the heaviest in decades. During beech masts, rat populations increase exponentially. As stoats prey upon on rats, stoat populations increase.

This operation will benefit the following threatened and at-risk species: native mistletoe, mohua, rock wren, kea, kaka, yellow crowned parakeet, whio, long-tailed bat. Other forest birds and native vegetation will also benefit from the outcome of this operation.

Native species monitoring of whio and rock wren is carried out by DOC as part of annual management and will contribute towards evaluating the success of this operation.

	Recent establishment of bird monitoring transects in the upper Hollyford will provide additional information on general bird abundance in relation to predator control regimes in the area.
2.2 Target(s)	DOC will undertake result monitoring. The targets are: Post operation rat tracking index <5% by February 2020. Possum indices ≤ 2% RTCI (or equivalent) Stoat tracking index of 0%

3. Consultation and consents

3.1 Consultation	DOC is responsible for creating a Communications Plan/s during the Pre-operational phase and conducting primary consultation with key stakeholders. DOC developed two communications plans – for all or multiple operations DOC-5731655 and for the Hollyford Valley DOC-5731651. DOC consults with our Treaty Partner Ngāi Tahu about the Fiordland Tiakina ngā manu operations planned for 2019. Consultation occurs through Kaitiaki Rōpū o Murihuku; a forum involving representatives from each of the four Rūnanga Papatipu Murihiku (Hokonui, Waihōpai, Ōraka Aparima and Awarua) who are mandated to speak on behalf of their whanau/hapū and Rūnanga. DOC also consults with Te Ao Marama (TAMI). TAMI represents tangata whenua for resource management purposes and is made up of representatives of the four Rūnanga Papatipu Murihiku. DOC also consult with Te Rūnanga o Makaawhio. The Hollyford Communications Plan was handed over to EcoFX on 9.4.19. See the EcoFX Comms Log Hollyford Aerial 2019 DOC-6015263 . 16 of 18 landowners have given written permission (see Appendices) for trickle feed 1080 to be applied over the majority of their property. Hand laid bait will be applied to within 20m of buildings. WARO has been consulted, have no concerns and are supportive of the operation.

3.2 Consents

The following documents are attached as Appendix 4:

- ☑ Public health permission
- ☑ Copies of landowner/occupier consents (if obtained in writing) – links only
- ☐ Other (specify):
- ☐ Other (specify):

4. Methods

4.1 Treatment block 1 (Upper Hollyford and Lower Hollyford)

Pesticides—aerial

Updated advice received from the Tiakina Nga Manu Technical Advisory Group (TAG) in August 2019:

A higher sowing rate than 1.5 kg/ha may be required for this operation to be successful because of the current mast conditions. A sowing rate of 2kg/ha has been recommended for this operation. This rate complies with the kea code of practice which allows 2/kg ha in kea habitat and is within the sowing rate limit allowed by the PHU consent. The revised sowing rate is likely to result in more effective results in terms of rat mortality, and any potential effects of the increase in sowing rates on non-target native species is low and acceptable (DOC-6036962).

Pesticide use #1 & #140 [Sodium fluoroacetate][1.5g/kg] [Cereal pellet][aerial]	**Target pest** [Possums and Rats]
Brand name of pesticide	**0.15% 1080 Pellets (6g RS5)**
Lure/mask (& %)	**Cinnamon 0.3%, dyed green**
Type of pre-feed (lure/dye)	**6g RS5 1.5% Cinnamon lured**
Number of pre-feeds (if any)	One
Sowing rates for pre-feed and toxic bait	2kg/ha
Other details about this method Main treatment strategy	

Pesticides—hand laying operations
Describe the pesticide use, covering the following points:

Pesticide use [2] Sodium fluoroacetate] [1.5g/kg] [Cereal pellet][hand laying]	**Target pest** [Possums & Rats)]
Brand name of pesticide	**0.15% 1080 Pellets (6g RS5)**
Lure/mask (& %)	**Cinnamon 0.3%, dyed green**
Type of pre-feed (lure/dye)	**6g RS5 1.5% Cinnamon lured**
Number of pre-feeds (if any)	1
Sowing rate toxic	2kg/ha
Sowing rate pre-feed	2kg/ha
Other details about this method May not be required.	

Pesticides—hand laying operations
Describe the pesticide use, covering the following points:

Pesticide use (141) Sodium fluoroacetate][1.5g/kg] [Cereal pellet][hand laying]	**Target pest** [Possums & Rats)]
Brand name of pesticide	**0.15% 1080 Pellets (6g RS5)**
Lure/mask (& %)	**Cinnamon 0.3%, dyed green**
Type of pre-feed (lure/dye)	**6g RS5 1.5% Cinnamon lured**
Number of pre-feeds (if any)	1
Sowing rate toxic	2kg/ha
Sowing rate pre-feed	2kg/ha
Other details about this method May not be required.	

4.2 Justification for proposed method (Upper

Aerially broadcast 1080 is the chosen control method as it is currently the only tool that can achieve high operation efficacy and efficiency for rat and possum control at a landscape scale (Fairweather *et al.*, 2018). It is also the most effective and

and Lower Hollyford)

efficient method of rat and possum control over difficult and remote terrain.

Timing of aerial 1080 treatment targeting rats can depend on multiple factors, including forest/habitat type, food availability/seed fall, and the times of heightened vulnerability to predation of the species being protected.

Tracking tunnel indices for 2019:

	February	**May**	**August**
Upper Hollyford	**7%**	**29%**	**71%**
Lower Hollyford	**5%**	**19%**	**43%**

This operation will comply with the updated Method Best Practice for BFOB aerial 1080 baiting (DOC-2749355) and current Code of Practice for aerial 1080 in kea habitat (DOC-2612859).

4.3 Treatment Block 2 Hand Broadcast

Hand broadcast bait has been included due to PHU conditions. The Public Health Permission excludes aerial and hand broadcast toxin within specific distances that vary before and after the 20th October. Should the operation take place after 20 October, the increase in aerial exclusion area means that the resulting bait gaps will need to be hand broadcast.

4.4 Justification for proposed method (treatment block name)

See above.

5. Further information

Details of contractor or principle

The operation is contracted to EcoFX on behalf of a principle organisation:

Principle company/organisation:	Department of Conservation Te Anau Office

Contact person:	s 9(2)(a), 9(2)(g)(ii) [redacted]
Contact number:	s 9(2)(a), 9(2)(g)(ii) [redacted]

Further information

EcoFX will be continuing their communications with private landowners and concessionaires involved in the operation. Written and signed permission to aerially treat land concerned with 1080 and water intake information has been gained. Tracks will not be closed.

Staff will be positioned at the following huts and locations as was done 2017.

Location name	Fact sheet in hut	Stay Overnight
Divide Shelter	Yes	No
Lake Marian Track	Yes	No
Monkey Creek Carpark	Yes	No
Humboldt falls Car Park/ Hollyford Road End	Yes	No
Lake Howden Hut	Yes	Yes
Lake Mackenzie Hut	Yes	Yes
Hidden Falls Hut	Yes	Yes
Lake Alabaster Hut	Yes	Yes
McKerrow Island Hut	Yes	Yes
Demons Trail Hut	Yes	Yes
Hokuri Hut	Yes	Yes
Lake McKellar Hut	Yes	No
Routeburn Falls Hut	Yes	No
Martins Bay Hut		Yes

Staff will advise members of the public who are already on the tracks to stay in the huts while the relevant sections of tracks are sown with bait and will check tracks and areas around huts for bait. All spouting will be disconnected on all huts for the duration of the operation.

Physical barriers such as warning tape and warning signs will be placed at

- Falls Creek route
- Pass Creek Track
- Deadmans Track
- Moraine Creek Track
- the Hollyford Track (Lake Alabaster entrance)
- Long Reef Point to Big Bay Track
- the entrance to the Hollyford Track from the Hollyford

Road end
- entrance to the Routeburn Track from the Divide
- the Greenstone campsite entrance to the treatment block
- the start of the Lake Marion track from the carpark.

The Fiordland and Wakatipu Visitor's centres and transport operators will be informed in advance of the operation so they will be able to advise potential visitors against entering the operational area during the time of the operation.

A security form will be engaged to ensure staff safety at loading sites.

Appendix 1: DOC Performance Standards

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

Pesticide Use #1	Sodium fluoroacetate 1.5g/kg Cereal pellet Aerial (0.15% 1080 Pellet)	Target Pests: Possums, Rats

Location of operation
Upper and Lower Hollyford

CSL REQUIRED

Caution Period
The estimated caution period for this operation is 8 months after last date of bait application and is subject to compulsory bait and carcass monitoring. This estimated caution period cannot be reduced to less than 4 months and must be extended if the endpoints for monitoring have not been met at the end of the period.

Performance Standards

*Compulsory for **all** operations*

1. For operations targeting rats, prefeed with this pesticide use.
2. The DOC Code of practice for aerial 1080 in kea habitat DOC-2612859 must be followed.
3. Flight paths to and from the bait loading zones by aircraft equipped with loaded or uncleaned bait sowing equipment must avoid: stocked paddocks, residential dwellings, and any other 'no fly zones' specified by consent providers.
4. An aircraft must not, when flying to or from the treatment area, fly over a public drinking water supply or waterway that is less than 100 metres upstream of a point of extraction from a water source for a drinking water supply (not being a water supply exclusively for stock).
5. For operations targeting possums, baits will have a mean size in excess of 6g and 95% of baits should weigh more than 4g.
6. The baits must be dyed green or blue.
7. The boundaries of the bait preparation and loading site are marked and loading site signs docdm-181171 erected. At the end of every day of the operation (including the final day), the loading site and any storage area must be fenced so that people do not inadvertently enter the site and stock cannot gain access to the area. The fence and signs remain in place until the area is decontaminated.
8. If there is any likelihood that farm stock has been exposed to 1080, the owner must be advised as soon as possible, and stock removed from the area.
9. The product must only be used as specified on the manufacturer's product label.

Compulsory for this operation

10.

Information Needs

*Compulsory for **all** operations*

Nil

Compulsory for this operation

1. *[Add as required.]*

Operational Planning & Design Considerations

- Apply bait in coldest months of year.
- For operations targeting possums, do not repeat aerial operations within 4 years using the same bait.
- Current Agreed Best Practice – Possum Control – Aerial Application of 1080 Cereal Pellets docdm-341728

- Current Agreed Best Practice – Rat Control – Aerial Application of 1080 Cereal Bait docdm-29375

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

_____.

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

Pesticide Use #2	Sodium fluoroacetate 1.5g/kg Cereal pellet Handlaying (0.15% 1080 pellet)	Target Pests: Possums, Rats

Location of operation
Upper and Lower Hollyford

CSL REQUIRED

Caution Period
The estimated caution period for this operation is 8 months after last date of bait application and is subject to compulsory bait and carcass monitoring. This estimated caution period cannot be reduced to less than 4 months, and must be extended if the endpoints for monitoring have not been met at the end of the period.

Performance Standards

*Compulsory for **all** operations*

1. For operations targeting rats, prefeed with this pesticide use.
2. For operations targeting possums, baits will have a mean size in excess of 6g and 95% of baits should weigh more than 4g.
3. The baits must be dyed green or blue.
4. The product must only be used as specified on the manufacturer's product label.

Compulsory for this operation (delete those that you won't be applying to your operation)

5. The DOC Code of practice for aerial 1080 in kea habitat DOC-2612859 must be followed.
6. *[Add further standards as required. These could include local performance standards as well as any recommendations from Current Agreed Best Practice that you want to apply to your operation. Attach conditions from other consents as separate pages.]*

Information Needs

*Compulsory for **all** operations*

Nil

Compulsory for this operation

Operational Planning & Design Considerations

- Current Agreed Best Practice – Possum Control – Handlaying 1080 Cereal Pellets docdm-29797.

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

_____.

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

Pesticide Use #140	Sodium fluoroacetate 1.5g/kg Cereal pellet Aerial (Pestex)	Target Pests: Possums, Rats

Location of operation
Upper and Lower Hollyford

CSL REQUIRED

Caution Period
The estimated caution period for this operation is 8 months after last date of bait application and is subject to compulsory bait and carcass monitoring. This estimated caution period cannot be reduced to less than 4 months, and must be extended if the endpoints for monitoring have not been met at the end of the period.

Performance Standards

*Compulsory for **all** operations*

11. For operations targeting rats, prefeed with this pesticide use.
12. The DOC Code of practice for aerial 1080 in kea habitat DOC-2612859 must be followed.
13. Flight paths to and from the bait loading zones by aircraft equipped with loaded or uncleaned bait sowing equipment must avoid: stocked paddocks, residential dwellings, and any other 'no fly zones' specified by consent providers.
14. An aircraft must not, when flying to or from the treatment area, fly over a public drinking water supply or waterway that is less than 100 metres upstream of a point of extraction from a water source for a drinking water supply (not being a water supply exclusively for stock).
15. For operations targeting possums, baits will have a mean size in excess of 6g and 95% of baits should weigh more than 4g.
16. The baits must be dyed green or blue.
17. The boundaries of the bait preparation and loading site are marked and loading site signs docdm-181171 erected. At the end of every day of the operation (including the final day), the loading site and any storage area must be fenced so that people do not inadvertently enter the site and stock cannot gain access to the area. The fence and signs remain in place until the area is decontaminated.
18. If there is any likelihood that farm stock has been exposed to 1080, the owner must be advised as soon as possible, and stock removed from the area.
19. The product must only be used as specified on the manufacturer's product label.

Compulsory for this operation

Information Needs

*Compulsory for **all** operations*

Nil

Compulsory for this operation

2. *[Add as required.]*

Operational Planning & Design Considerations

- Apply bait in coldest months of year.
- For operations targeting possums, do not repeat aerial operations within 4 years using the same bait.
- Current Agreed Best Practice – Possum Control – Aerial Application of 1080 Cereal Pellets docdm-341728
- Current Agreed Best Practice – Rat Control – Aerial Application of 1080 Cereal Bait docdm-29375

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

_____.

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

Pesticide Use #141	Sodium fluoroacetate 1.5g/kg Cereal pellet Hand laying (Pestex)	Target Pests: Possums, Rats

Location of operation
Upper and Lower Hollyford

CSL REQUIRED

Caution Period
The estimated caution period for this operation is 8 months after last date of bait application and is subject to compulsory bait and carcass monitoring. This estimated caution period cannot be reduced to less than 4 months, and must be extended if the endpoints for monitoring have not been met at the end of the period.

Performance Standards

*Compulsory for **all** operations*

7. For operations targeting rats, prefeed with this pesticide use.
8. For operations targeting possums, baits will have a mean size in excess of 6g and 95% of baits should weigh more than 4g.
9. The baits must be dyed green or blue.
10. The product must only be used as specified on the manufacturer's product label.

Compulsory for this operation (delete those that you won't be applying to your operation)

11. The DOC Code of practice for aerial 1080 in kea habitat DOC-2612859 must be followed.
12. *[Add further standards as required. These could include local performance standards as well as any recommendations from Current Agreed Best Practice that you want to apply to your operation. Attach conditions from other consents as separate pages.]*

Information Needs

*Compulsory for **all** operations*

Nil

Compulsory for this operation

Operational Planning & Design Considerations

- Current Agreed Best Practice – Possum Control – Handlaying 1080 Cereal Pellets docdm-29797.

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

_____.

Appendix 2: Maps

Operational maps:
Maps 1 DOC-6000589
Map 2 DOC-6014728
Map 3 DOC-6014729

Appendix 3: Communication Record

See EcoFX comms record:

BFOB 2019 Hollyford DOC-6015263 and record of landowner visits DOC-6015263

See DOC comms records:

DOC Comms Plan BFOB 2019 All_Multiple Sites DOC-5731655

DOC Comms Plan BFOB 2019 Hollyford DOC DOC-5731651

Appendix 4: Consents

Landowner consents

	Consents given	Consent	Map
	Lower Hollyford Block		
1	s 9(2)(a)	DOC-6070510	DOC-6070580
2	s 9(2)(a)	DOC-6070512	DOC-6070581
3	s 9(2)(a)	DOC-6070514	DOC-6070582
4	s 9(2)(a)	DOC-6070509	DOC-6070578
5	s 9(2)(a)	DOC-6070506	Consent & map combined
6	s 9(2)(a)	DOC-6070507	Consent & map combined
7	s 9(2)(a)	DOC-6070508	Consent & map combined
8	s 9(2)(a)	DOC-6070513	Consent & map combined
9	Forest & Bird	DOC-6070429	
10	s 9(2)(a)	DOC-6070427	DOC-6070428
11	Out of scope	DOC-6070432	DOC-6070430
12	s 9(2)(a)	DOC-6070426	
13	Houghton Family Trust	DOC-6081004	
14	s 9(2)(a)	DOC-6080998	
	Upper Hollyford Block		
15	Ultimate Hikes	DOC-6070584	DOC-6070583
16	Gunns Camp	DOC-6070511	

The following landowners did not give consent and their land will not be treated:

	No consent given	Outcome
	Lower Hollyford Block	
17	s 9(2)(a) and Jerusalem Creek Ltd	Will not be treated aerially
18	s 9(2)(a) (Green Hut)	Will not be treated aerially

Hollyford Airstrip closure permission

DOC-6021961

Public Health Permission

The Public Health Permission excludes aerial and hand broadcast toxin within specific distances that vary before and after the 20th October. The operation will comply with all exclusion areas.

Public Health permission:

PHU application + maps	DOC-5982943	DOC-5982944

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 (DOC-DM-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

This operation in being conducted as part of the Tiakina Nga Manu (Battle for Our Birds) Programme. The Hollyford catchment is known as a biodiversity hotspot and many native species will benefit from this operation. The Hollyford catchment is likely to support the lizard *Woodworthia aff. maculatus* 'Otago large gecko'. The Hollyford River has clear waters and 24 macro invertebrates indicating good biodiversity (Ryder Consultancy 2007). Over 121 native invertebrates were found, including 60 moth species including the red admiral butterfly (Vanessa gonerilla) (Patrick 2007). The following nationally critical, endangered and vulnerable species are likely to benefit from the operation.

Species	Scientific Name	Threat Classification
Long-tailed bat	*Chalinobus tuberculatus*	Nationally critical
Rock Wren	*Xenicus gilviventris "southern"*	Nationally Endangered
Kea	*Nestor notabilis*	Nationally Endangered
Australasian Bittern	*Botaurus poiciloptilus*	Nationally Critical

Non-target species

Native species that may be present in the area include the following:

Species	Scientific Name	Threat Classification
South Island Kaka	*Nestor meridionalis*	Nationally Vulnerable
Kea	*Nestor notabilis*	Nationally Endangered
New Zealand Pigeon, Kereru	*Hemiphaga novaeseelandiae*	Not Threatened

New Zealand Falcon, Southern Falcon	*Falco novaeseelandiae "southern"*	Nationally Vulnerable
Tomtit	*Petroica macrocephala*	Not Threatened
South Island Robin	*Petroica australis*	At Risk
Brown Creeper	*Mohoua novaeseelandiae*	Not Threatened
Bellbird	*Anthornis melanura*	Not Threatened
Grey Warbler	*Gerygone igata*	Not Threatened
Fantail	*Rhipidura fuliginosa*	Not Threatened
Rifleman	*Acanthisitta chloris*	Not Threatened
Silver Eye	*Zosterops lateralis*	Not Threatened
Fiordland Crested Penguins	*Eudyptes pachyrhynchus*	Nationally Vulnerable
South Island Fernbird	*Bowdleria punctata*	At Risk
White Heron	*Ardea modesta*	Nationally Critical
Rock Wren	*Xenicus gilviventris "southern"*	Nationally Endangered
Australasian Bittern	*Botaurus poiciloptilus*	Nationally Critical
Long- tailed bat	*Chalinobus tuberculatus*	Nationally Critical
Tui	*Prosthemadera novaeseelandiae novaeseelandiae*	Not Threatened
Yellow - Crowned Parakeet Kakariki	*Cyanoramphus auriceps*	Not Threatened
Morepork	*Ninox novaeseelandiae*	Not Threatened
Longfin Eel	*Anguilla dieffenbachii*	At Risk

Effect of operation on native species

There is wide variation in sensitivity to 1080 between taxonomic groups. On a weight for weight basis, mammals are more sensitive than birds and invertebrates. There is also wide variation in sensitivity to 1080 within taxonomic groups.

There is wide variation to the impact on a population following the death of individuals within a native species. Species with a large population and/or a high rate of increase can quickly recover small losses. Threatened species usually recover slowly from small losses. This makes the consequences of death by predation or 1080 or other means more concerning.

There have been numerous studies examining the effects of aerial poisoning on native non-target populations over the last 20 years. 24 species of native birds, particularly threatened species, have been monitored. None of the studies have identified population level mortality which threatened the viability of the species

Limited monitoring of **short tailed bats** and native frogs showed no evidence of aerial 1080 poisoning. A total of 47 radio tagged **morepork** over 6 operations and none died from poisoning.

SI tomtits, grey warbler, SI robins and **riflemen** were counted on transects before and after the 2010 Waitutu aerial 1080 operation (1 kg ha-1 prefeed followed by 2 kg ha-1 0.15% 1080 pellets) located at five sites, three within the operational area and two in a non-treatment area. There was no evidence for population level impacts from 1080. All 60-radio tagged **kaka** survived 4 aerial 1080 operations in Waitutu Forest.

Invertebrate populations have been monitored in nine aerial poisoning operations and none have shown significant population effects on any species studied, nor is there evidence to suggest poisoned invertebrates are a significant factor in secondary poisoning of other animals. The risks 1080 operations pose to **aquatic species** is very low.

A total of 222 radio tagged **Kea** have been monitored before and after 19 aerial 1080 operations and 24 have died from poisoning This operation will comply with the DOC Kea code of practice DOC-2612859.

New Zealand lizards feed mostly on insects. A 2007 experiment by Marshall & Jewell on the attractiveness of non-toxic RS5 cereal pellets in a range of conditions to grand and Otago skinks showed that baits were sampled (licked, nudged or bitten) but no animals tried to consume large pieces of cereal bait (PIR DOC-25427).

Current studies indicate increasing long-tailed and short-tailed bat populations in areas with reduced mammalian pest numbers. Short tailed and long tailed bats were monitored following several aerial 1080 operations (Eglinton valley, Kepler Mountains'), with no adverse effects detected. Short tailed bats were individually marked before, during and after an aerial 1080 operation in the Eglinton valley in December 2014. One bat pup found dead under a roost tree tested positive for 1080 residues, however the survival of female bats for the season was 91.5%.

The control of introduced mammalian predators in the forest is expected to benefit native species populations and offset any non-target poisoning.

More specific information on this monitoring can be found in the Pesticide Information Review for 1080 (DOCDM-25427).

Performance standards and information needs

Adopting accepted best practice operational standards reduces the risk for birds. For 1080, dull-green dyed bait has been shown to be the least attractive colour to birds. Cinnamon–lured baits instead of fruit lures help to repel most birds. Ensuring bait meets all quality specifications is considered the best way to avoid adversely affecting birds.

The following compulsory performance standards will apply:

- Only use cinnamon lured RS5 pellets
- Bait will be dyed green or blue
- Bait will be screened to minimise undersized pellets

The alpine boundary has been chosen to provide as much protection to Rock Wren populations as possible while minimising the application of toxin into non-vegetated areas where it may pose more of a risk to birds.

The Code of Practice for Aerial 1080 Operations in Kea Habitat (DOC-2612859) will be followed. The compulsory standards for this are:

- Must use RS5 baits.
- Can only use cinnamon lure and must be 0.15% in prefeed baits and 0.30% in toxic baits.
- Prefeed and toxic must be sowed at a nominal rate of 2kg/ha for 6g baits.
- Operation must occur between 1 July 2019 and 31 July 2020 or further restrictions will apply.

Effects on non-target domestic and feral animals

Non-target species

Domestic and feral animals at or near the treatment area that may be affected by the proposed operation are the following:

- Sheep
- Cattle
- Dogs
- Feral goat
- Red deer
- Chamois
- Tahr

- Hare
- Rabbit
- Feral cat
- Canada Geese
- Magpie
- Trout

Effects of operation on domestic and feral animals

Dogs are highly vulnerable to 1080 both from scavenging poisoned carcases and consuming baits. The consultation and notification process, along with signage at points of public access, will inform neighbours and users of the forest of the presence of bait. Dogs are not permitted in this national park and no permits for dogs will be issued by DOC during the operation.

Feral **deer** population mortality from aerial 1080 operations is highly variable - between 30 and 60%. A low to moderate by-kill of deer populations is probably recovered within a couple of years.

Performance standards and information needs

Signs at every entry point will clearly state “no dogs”.

While the majority of the area is National Park and no dogs are allowed, there are sections of private land that are being treated. Private landowners have been notified of risks to dogs as part of the consultation.

No permits to take dogs into the treatment areas will be issued until the operational all-clear is given i.e. caution period has ended and warning signs have been removed by DOC staff.

Hunters and Wild Animal Recovery Concessionaires will be notified of the application of toxins by email and via the on-line Pesticide Summary.

Further information

Further information

None

References

The following published references were used in developing this AEE:

- Fairweather, A.A.C.; Broome, K.G. 2018: Sodium Fluoroacetate Pesticide Information Review. Version 2018/6. Unpublished report DOC-dm-25427, Department of Conservation, Hamilton, NZ. 134p.
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- Method Best practice for Battle for our Birds Aerial 1080 baiting Version 1.5 July 2018
- Hollyford Operational Plan 2019 DOC-5669967
- Kea survival during aerial poisoning for rat and possum control. Joshua R Kemp, Corey C Mosen, Graeme P Elliott, Christine M Hunter and Paul van Klink, June 05, 2018
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- Lloyd, B.D., McQueen, S.M. 2000 An assessment of the probability of secondary poisoning of forest insectivores following an aerial 1080 possum control operation. New Zealand Journal of Ecology 26(1): 47-56.
- Patrick BH 2007. Entomological effects associated with the proposed Milford-Dart tunnel through the Humboldt mountains of Western Otago. New Zealand Butterfly Enterprises Limited, Alexandra, New Zealand.
- Ryder Consulting 2007. Milford-Dart. An overview of ecological assessments. Ryder Consulting Limited, Dunedin.

Appendix 6:

If you need to add further appendices, please copy and paste the entire heading above and then change the appendix number and title. This will ensure that the formatting is retained and the text will be transferred to the Table of Contents. After completion of this form please remember to update the Table of Contents (right click on the table of contents for the 'update field' option).