Predator Free

Hanmer Springs

Department of Conservation
Te Papa Atawhai

Te Tihi o Rauhea
Hanmer Springs Conservation Trust

Hanmer Springs
Thermal Pools & Spa

Hanmer Springs Community Board

HURUNUI
District Council

Hanmer Springs Predator Free

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Part A:1 Introduction

Purpose and Structure of Report

'Predator free 2050' was launched in 2016 with the ambitious goal to rid New Zealand of possums, rats, and stoats by the year 2050. This report is an outline and plan for Te Tihi o Rauhea Hanmer Springs Conservation Trust in partnership with the Department of Conservation to implement the 'Predator Free 2050' campaign in the Hanmer Springs area.

Part A of this report outlines the broad plan for a Predator Free Hanmer Springs. **Part B** include tools and strategies for implementing the plan. A budget is not included in this version of the report.

Location

Te Whakatakanga o te Ngārahu o te ahi a Tamatea/ Hanmer Springs is an alpine village in the Hanmer River Basin, an intermontane basin in the upper reaches of the Waiau River catchment, 130km northwest of Christchurch in the Hurunui District.

Naturally occurring hot springs that have been developed into thermal pools and spas form the backbone of the district's economy. Set within a picturesque landscape and mountain backdrop, Hanmer Springs is a popular retirement and holiday destination. With a permanent population less that 1,000, it plays host to some 520,000 visitors a year. During peak periods, up to 5,000 people visit the council-owned thermal pools each day[1].

Hanmer Springs is a hub for a wide variety of walks and mountain bike rides from forest trails close to the village to mountain passes (Jacks and Jollies Passes) and iconic backcountry rides that form part of the New Zealand Cycle Trail: Rainbow and Molesworth Station Roads plus the St James Great Ride.

In order for Hanmer Springs to maintain and develop its image as a prime tourism destination, there is a strong impetus to incorporate environmentally and ecologically sustainable attributes into planning and development.

Implementation

For management purposes, Te Tihi o Rauhea Hanmer Springs Conservation Trust (**see page 6**) with the assistance of the Department of Conservation (DOC) will roll out Predator Free Hanmer Springs (PFHS) across an area defined as 'Falcon's-Kārearea Lair Conservation Area' in several phases over the next few decades using an adaptive management approach. This approach will enable the programme to be implemented in stages according to the available resources (financial, human, and technological) by refining strategies learned during earlier stages and incorporating the results.

The initial phase encompasses the township of Hanmer Springs, Conical Hill Reserve, Wetlands, and parts of the Chatterton River **(see map page 4).**

Falcon's-Kārearea Lair Conservation Area is a ~2,500ha area envisaged for the long-term implementation of Predator Free 2050. It includes the initial area plus lands surrounding Hanmer Springs belonging to Ngai Tahu (forest areas managed by Rayonier), the Hurunui District Council (managed by the Hanmer Springs Community Board) and the Crown (managed by the Department of Conservation).

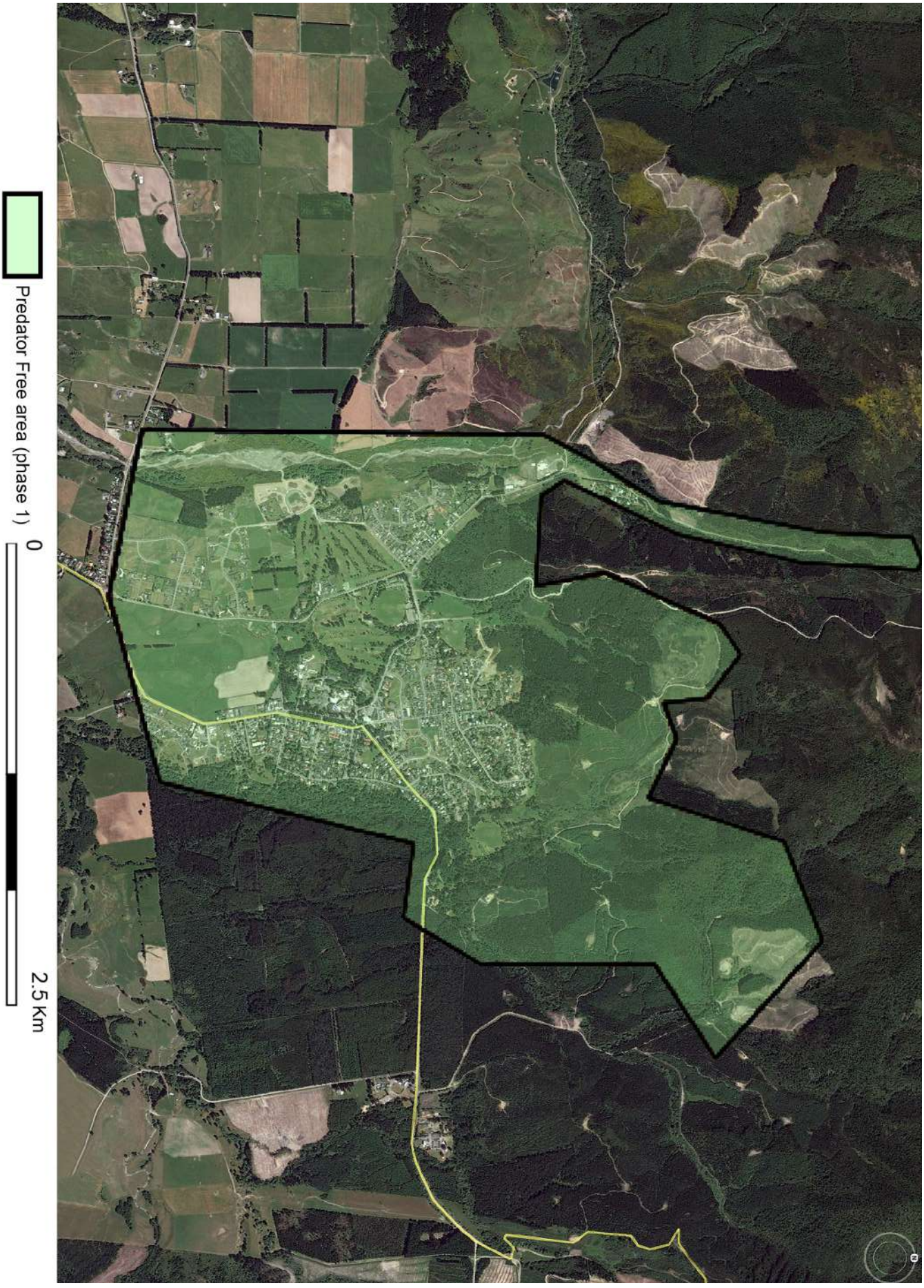
What's in a name?

The Ngāi Tahu name for Hanmer is Te Whakatakanga o te ngārahu o te ahi a Tamatea, which means "Where the ashes of Tamate's fire lay". The name comes from the story of Tamatea Pokai Whenua's travels to the South Island. His waka, the Takitimu, capsized in the south of the South Island. Tamatea Pokai Whenua and his followers had to walk up along the east coast of the South Island in blizzard like conditions.

When they reached Banks Peninsula, Tamatea stood on the mountain now known as 'Te Poho o Tamatea' and recited karakia to North Island tohunga. The tohunga responded by sending large flames from volcanoes in the North Island, which reached Banks Peninsula and helped keep Tamatea and his followers warm. When the flames were travelling down the country some fragments fell off and formed the area that we know as Hanmer Springs.

- Te Rūnanga o Kaikōura Environmental Management Plan: (p149)

[1] 2013 New Zealand census statistics.



Map Initial phase: Hanmer Springs township, Conical Hill Reserve, wetlands, and the Chatterton River.

Part A:2 Predator Free 2050

The goal of 'Predator Free 2050' is to remove three species of predators in New Zealand: possums, stoats, and rats, by 2050[2]. These three species have been targeted for well-understood and well-documented reasons[3]. The purpose of this goal is to remove the threat to our natural taonga, our economy, and our primary sector[4]. Ferrets, weasels, mice, hedgehogs, and other predators such as Australasian magpies and wasps are regarded as secondary targets.

The term 'predator free' is, by definition, a complete absence of predators such that they will not reinvade once removed from an area[5]. Therefore, to fulfil the goal of Predator Free 2050, two conditions must be met:

(a) every individual possum, stoat, and rat must be removed or killed faster than they can reproduce, and;

(b) there can be no re-invasion following complete removal.

Eradicating predators to the point that they will not reinvade has thus far proved elusive in mainland New Zealand. In spite of predator proof fences, predators still periodically breach ecosanctuaries such as Maungatautari Ecosanctuary (3,400 ha), Shakespear Open Sanctuary (500 ha), and Tawharanui Sanctuary (550 ha)[6]. The initial capital investment in and ongoing maintenance of these fences, and the continuous monitoring and management needed to deal with immigrant pests, is an enormous financial burden. For example, the 1.5km fence containing the Shakespear Open Sanctuary near Auckland, cost $750,000 in 2011[7]. Fencing is impractical in many instances, for example, in braided rivers and where migratory birds nest in different locations each season. There has been considerably more success in permanently removing pest species from islands, with over 100 islands now pest free[8].

However, removing all three targeted predatory species—rats, stoats, and possums—from any single location, has yet to be achieved.

One 'predator free' strategy does not suit all situations

It is not within the scope of this document to review previous or current predator control or removal programmes. Nor is it there a place here to discuss the complexity and variety of predator guilds across the many different ecosystems in New Zealand or in the wider Hanmer Springs area. However, it is important to note that an ad hoc approach to removing any single predator or pest species[9] from an area risks unintended consequences that may exacerbate existing problems.

For example, if the population of a pest species such as rabbits is vastly reduced through the Korean calicivirus (K5), predators will turn to alternative prey such as rats and mice, but they will also turn to endemic birds, reptiles, and invertebrates. Similarly, in areas where pest control (rats, stoats, and possums) has been maintained at zero density, there has been a decline in lizard populations. Anecdotal evidence suggests that this intense pest control has resulted in a concurrent increase in the mouse population[10]. As areas around Hanmer Springs including Conical Hill are known to sustain a significant population of Rough Geckos (*Naultinus rudis*) as well as other lizards[11], any predator/pest management plan therefore needs to be designe to fit highly variable local conditions, and also be adaptable and responsive to changing circumstances.

[2] Predator Free 2050: *http://www.doc.govt.nz/Documents/our-work/predator-free-2050.pdf*

[3] See for example Parliamentary Commissioner for the Environment (2011) Evaluating the use of 1080: Predators, poisons and silent forests *http://www.pce.parliament.nz/publications/evaluating-the-use-of-1080-predators-poisons-and-silent-forests* and Parliamentary Commissioner for the Environment (2017) 'Taonga of an island nation: Saving New Zealand's birds' *http://www.pce.parliament.nz/publications/taonga-of-an-island-nation-saving-new-zealands-birds*

[4] Predator Free 2050

[5] Curnow , M. & G.N. Kerr (2017) Predator Free Banks Peninsular: Scoping Analysis. LEaP Research Report No: 44: *https://researcharchive.lincoln.ac.nz/handle/10182/8060*

[6] Op. cit.

[7] *http://www.sossi.org.nz/the-sanctuary/the-fence*

[8] *http://www.doc.govt.nz/nature/habitats/offshore-islands*

[9] Not all predators are pest species, likewise, not all pest species are predators; see **Part B:2 for more details**

[10] Lyn Adams, Technical advisor, fauna—Mātanga Ao Kararehe, NZ Lizard TAG Leader (email, September 2018).

[11] Marieke Lettinke, Technical advisor, fauna—Mātanga Ao Kararehe, (email, 05 October 2018).

Given these complex variables, 'Predator Free 2050' can best be regarded as aspirational, that is, a strategic call to arms to develop and implement an arsenal of weapons and the social license to use them in order to 'remove the threat to our natural taonga, our economy, and our primary sector' . Depending on the nature of those weapons, legislative changes to enact them may also be required . To a large extent, it is assumed that some of these yet-to-be-developed technologies and strategies will assist in eradicating, or where eradication is deemed unnecessary or undesirable, identifying and controlling a wider number of predators and pest species including ferrets, weasels, mice, hedgehogs, cats, feral pigs, wallabies, wasps, feral goats, and southern black-backed gulls.

Te Tihi o Rauhea Hanmer Springs Conservation Trust

Established in 2014, the Trust was an initiative of members of the local Hanmer community in partnership with Ngai Tahu and others. The members of the Board (as of Septmeber 2018), are: Chris Hughey, Prof. Ken Hughey, Graeme Abbot, and Cr. Jason Fletcher.

The overarching goals of the Trust are threefold:

1. To nurture, develop and reinstate as needs determine the area to a level that encourages native birds, plants and other species to regenerate and reinvigorate the area

2. Work actively with local and national bodies to provide the infrastructure and intellectual know how to enable the Trust to achieve its goals

3. Enhance and encourage human interaction and experiences that are in harmony with the wildlife of the area

Activities of the Trust to date have focused mainly on Hanmer Springs wetland restoration, community dialogue, and planning strategic objectives to function as an umbrella group to:

1. Implement a 'Predator Free 2050' programme across the greater Hanmer Springs area known as Falcon's-Kārearea Lair Conservation Area

2. Provide effective leadership and advocacy, and encourage co-operation between all parties whose interests and activities involve conservation in and around Hanmer Springs

3. Facilitate the collection, storage, and sharing of data and information on conservation activities in this area and/or relevant to this area, amongst all interested parties and organisations

The following section refers to the first of these objectives.

Implementing a 'Predator Free 2050' programme across Hanmer Springs

Purpose[11]

1. Improve the natural environment so as to restore biodiversity, protect and cherish taonga species

2. Become an exemplar community engagement project for the Predator Free 2050 campaign

3. Enable businesses to benefit from the above through participation and accreditation[12].

Existing flora and fauna

Native vegetation: forest, scrublands, grasslands, braided riverbed turfs, and fungi, in addition to exotic weeds including wilding pines, are variously scattered and clumped all through the area. A list if these are not included in this report, as a comprehensive biological stocktake is yet to be undertaken.

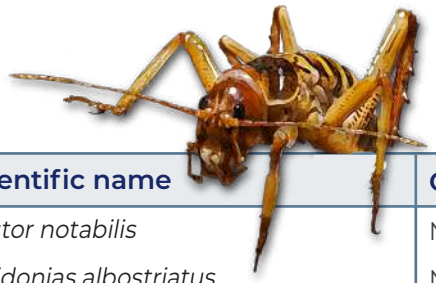
The following pages lists known fauna and predators. Note, this list is not exhaustive; it is based entirely on documented sightings. As with vegetation, a stocktake is yet to be undertaken. Taonga species[13] are marked with an asterisk *.

Protecting the existing fauna population and restoring their numbers through a 'predator free' programme will fulfil the primary purpose of making Hanmer Springs 'Predator Free'.

[12] These reflect both the cultural values set out in the Te Rūnanga o Kaikōura Environmental Management Plan: *http://ngaitahu.iwi.nz/te-runanga-o-ngai-tahu/papatipu-runanga/kaikoura/environmental-management-plan/* and the goals of the New Zealand Government Predator Free 2050 initiative: *http://www.doc.govt.nz/Documents/our-work/predator-free-2050.pdf*

[13] From: *https://www.doc.govt.nz/documents/about-doc/concessions-and-permits/conservation-revealed/ngai-tahu-taonga-animals-lowres.pdf*

Known Existing Wildlife: endemic, native, and naturalised



Common name	Scientific name	Conservation status[14]
* Kea – mountain parrot	*Nestor notabilis*	Nationally Endangered
* Black-fronted tern – tarapirohe	*Chlidonias albostriatus*	Nationally Endangered
* Banded dotterel – tūturiwhatu	*Charadrius bicinctus*	Nationally Vulnerable
* Rough gecko – moko kākāriki	*Naultinus rudis*	Nationally Vulnerable
* South Island pied oystercatcher/SIPO – tōrea	*Haematopus finschi*	At Risk
* South Island robin – kakaruwai/ tōtōara	*Petroica australis*	At Risk
* Canterbury grass skink – mokomoko OR[11] South Marlborough grass skink – mokomoko	*Oligosoma aff. polychroma Clade 4 OR Clade 3*	Declining
* New Zealand falcon – kārearea	*Falco novaeseelandiae*	Recovering
* South Island tomtit – ngirungiru/ kōmiromiro	*Petroica macrocephala*	Not threatened
* Grey warbler – hōrirerire/riroriro	*Gerygone igata*	Not threatened
* Fantail – pīwakawaka	*Rhipidura fuliginosa*	Not threatened
* Bellbird – tītapu/kōpara	*Anthornis melanura*	Not threatened
* Tūī	*Prosthemadera novaeseelandiae*	Not threatened
* New Zealand pigeon – kererū	*Hemiphaga novaeseelandiae*	Not threatened
* Australasian swamp Harrier – kāhu	*Circus approximans*	Not threatened
New Zealand scaup – papango	*Aythya novaeseelandiae*	Not threatened
* Pukeko – Australasian swamphen	*Porphyrio melanotus*	Not threatened
* Pied stilt – poaka	*Himantopus himantopus leucocephalus*	Not threatened
Silvereye/waxeye – hiraka/kanohi mōwhiti	*Zosterops lateralis lateralis*	Not threatened
* Southern Alps gecko – mokomoko	*Hoplodactylus "southern alps"*	Not threatened
Blackbird	*Turdis merula*	Not threatened
European starling	*Sturnus vulgaris*	Not threatened
House sparrow	*Passer domesticus*	Not threatened
Southern Alps gecko - mokomoko	*Woodworthia "Southern Alps"*	Not threatened
Minimac gecko - mokomoko	*Woodworthia "Marlborough mini"*	Not threatened
Mountain stone weta – wēta	*Hemideina maori*	Not threatened
Ground weta – wēta	*genus Hemiandrus*	Not threatened
Other invertebrates	including genus *Brachaspis*	Not threatened
Endemic and introduced fish		

[14] Conservation Status of New Zealand Birds 2016: *https://www.doc.govt.nz/Documents/science-and-technical/nztcs19entire.pdf*;
Conservation status of New Zealand Reptiles 2015: *https://www.doc.govt.nz/Documents/science-and-technical/nztcs17entire.pdf*,
Conservation Status of New Zealand Orthoptera, 2014*: https://www.doc.govt.nz/Documents/science-and-technical/nztcs16entire.pdf*

Known Predators

Common name	Scientific name
Stoat	*Mustela ermine*
Ferret	*Mustela putorius furo*
Ship Rat	*Rattus rattus*
Norway Rat	*Rattus norvegicus*
* Pacific Rat	*Rattus exulans*
Mouse	*Mus musculus*
Cat	*Felis silvestris catus*
Possum	*Trichosurus Vulpecula*
Common wasp	*Vespula vulgaris*
* Southern black-backed gull	*Larus dominicanus*

What will 'predator free' look like for Hanmer Springs?

As the term 'predator free' is, by definition, a complete absence of predators such that they will not reinvade once removed from an area, given existing technological capabilities and assets at this time, it is more practical to control rather than eradicate predators[15]. Control can be regarded as a tactical holding action until such times as the overarching strategic goal of 'predator free' (eradication) is technically and financially feasible and the method/s for doing so are socially, culturally, and economically acceptable.

'Predator Free' Hanmer Springs will be implemented in several phases over the next few decades. Results from wildlife monitoring will help guide the scale and scope of predator control at each phase, with new technologies trialled where deemed appropriate. The aim is for this to become a 'whole of community' engagement project so that residents, businesses, and visitors alike can become actively involved in some capacity (see **Part B:3** and **B:4**).

To facilitate this, predator control in Hanmer Springs will be carried out in conjunction with other conservation programmes including control of pest species, restoration of native vegetation and wetlands, and a 'whole of community' engagement programme through a range of activities.

How will success be measured?

- √ Improved biodiversity: measured by monitoring changes in biodiversity (through formal and informal methods) over time
- √ Exemplar community engagement: measured by the extent of private and business engagement
  - √ Increased volunteerism
  - √ Relationship building with Predator Free initiatives elsewhere in New Zealand: measured by the level of innovative techniques used and improved biodiversity
  - √ Community receptivity to new predator free/conservation technologies
  - √ Community receptivity to potential changes in planning rules (over years or decades) to enact further actions to better control and ultimately eradicate predators
- √ Enable businesses to benefit: measured by the number of businesses engaged in strategies (**see Part B:4**), and feedback from them over time

[15] From a financial perspective, control at low densities is far less costly to implement and maintain. For example, removing 95% of possums in an area costs around $20-$30 ha^{-1}, while removing 100% of possums costs around $400 ha^{-1}. See Curnow , M. & G.N. Kerr (2017) Predator Free Banks Peninsular: Scoping Analysis. LEaP Research Report No: 44: *https:// researcharchive.lincoln.ac.nz/handle/10182/8060*

PartB:1 Action Plan

An action plan should be adaptive. That is, it should be able to respond to changes in circumstances and outcomes that may result after each task is implemented. New information should then be then used to re-evaluate the purpose, goals, and procedures for each phase.

An action plan should state:

- What we want to achieve (goal/s)
- Why we want to achieve it (purpose)
- What we will do (actions for each goal)
- We know we have succeeded when (outcome for each action and milestones towards final goals)
- Who will lead it (governance / management)

An action plan that is revised in response to changing outcomes is referred to as a living document, whereby the results of key actions and goals are assessed and evaluated, with findings/shortfalls incorporated into the updated Plan.

The following points should be taken into consideration when re-evaluating an action plan for Predator Free Hanmer Springs:

- Establish a time frame for evaluation and if necessary, re-direction. Adapt or redirect priorities. Reducing, expanding, or changing the first location targeted to become 'predator free' may be deemed necessary.
- Identify gaps in resources (including knowledge resources)
- Determine if there is a need for further/different level of stakeholder engagement
- Re-draft plan accordingly
- Establish time frame for second evaluation and possible re-direction

A preliminary Action Plan has been submitted with this document as an xls spreadsheet. It is designed to be updated continuously as tasks are completed and new tasks identified. Processes to assist with implementing elements of this Action Plan are outlined in the following sections.

Part B:2 Stocktake Assets & Identify Risks

A stocktake should include:

- Potential stakeholders (see **Part B:4**)
- Existing environmental/social/outreach programmes including weed and wilding pines control, native restoration, extension of DOC tracks, implementation of Chatterton River plan etc.
- Existing Council and DOC plans and policies. Several of these will likely segue with the overarching plan. Building on these existing plans and operations makes use of some existing assets and segues with local planning requirements. See for example Conical Hill plans[16]
- Cultural assets
- Physical assets
- Environmental characteristics: geophysical conditions as well as biodiversity stocktake
- Social assets including communications/media capabilities and social impact assessment (SIA) capabilities
- Technological/knowledge or capacity to acquire through relationships with providers. This may also include SIA capabilities
- Financial: this may dictate which area/s are selected first for predator eradication/control

Identify where possible potential risks and shortfalls including:

- Cultural values, potential archaeological sites
- Environmental: eg the impact that changing the balance of predator/prey relationships may have
- Social values: results of social impact assessment to determine values associated with killing predators, for example cats versus ferrets and hedgehogs; possums may have economic values. Methods of killing, eg, poison vs trapping (see **Part B:2** for example of a social survey).

This is one of the most frequently overlooked but most important tools for success in any pest eradication programme that involves a community[17].

- Financial limitations/risks (budget for each stage)
- Technological (may trigger social)
- Physical: organisations are required to create and implement risk management plans and strategies (see page 13 as an example; DOC also have RAMS forms that can be used as a guideline)
- Planning and RMA requirements. Resource consent under the Resource Management Act 1991 is required for the construction of any predator-proof fence and for aerial application of toxins.

Repeat stocktake and risk assessment at each stage

While the purpose and many of the overarching goals and assets may be applicable to short-term goals, this is not always the case. For example, the strategies used to control predators around urban dwellings will differ to those strategies used in conservation lands. **Part B:3** includes a useful tool 'Decision tree' in deciding.

[16] The Conical Hill Reserve Management Programme 2012-2022 includes pest control in its work programme (Section 5.1 p 7) Conical Hill Revegetation Plan (11.7 hectares): *http://www.hurunui.govt.nz/assets/Documents/Township%20Plans/Conical-Hill-revegetation-plan-web.pdf*

[17] Russell, JC et al (2017) Social assessment of inhabited islands for wildlife management and eradication. Australasian Journal of Environmental Management 25:1 pp 24-42

Risk identification and Management (not necessarily comprehensive)

Risks	Management
Governance/management expertise? Cultural, community, and business representivity?	Trust board members include: DOC Chief Scientist, elected members of the Hanmer Springs Community Board (HSCB), manager Hanmer Springs pools, agent for majority of residential dwellings, elected HDC Councillor.
Community resistance	Town and ward planning, community ethos, and tourism + affiliate businesses are aligned to the principles of protecting and restoring biodiversity. Stakeholder, communications and accreditation plans plus implementation (action plan) underway
Funding shortfall	The project has been designed to be downsized or up-scaled according to the available budget and human resources
Alignment with strategic Ngai Tahu, NZ Government/DOC Plans and Policies?	Aligns with high-level goals of Predator Free 2050 Strategy and Te Rūnanga o Kaikōura Environmental Management Plan Te Mahere Whakahaere Taiao o Te Rūnanga o Kaikōura. MOUs have been or are currently being negotiated with between the Trust, Ngai Tahi, HDC, DOC, Rayonier etc.
Local Māori cultural sites/values?	No wāhi tapu sites or pā, kāenga, and/or nohoanga have been identified or known to be in the area. The goals of the Trust and of Predator Free Hanmer Springs align with the values to help replenish the mauri of waterways and wetlands, and restore important mahinga kai sites.
Kiore and black-backed gulls are taonga species	Case-by-case consultation with Ngai Tahu; black-backed gulls are not currently part of the short-term plans; kiore are not specifically targeted but may be present.
Conflict with other Hanmer Springs community groups/activities	Aligns with goals and aspirations of Hanmer Springs Track Network, which itself includes DOC, Ngai Tahu, Rayonier, HS Biking, Horsing, Tramping clubs, businesses and HSCB. No other potential conflicts identified.
Conflict with planning and/or business aspirations?	Aligns with goals and aspirations to develop the community as a high value alpine destination; aligns with tourism marketing, offers leveraging opportunities for businesses through accreditation plan.
Conflict with commercial possum hunters	While possums are deemed and 'unwanted organism' under the Biosecurity Act 1993, Biosecurity Law Reform Act 2012, and National Pest Management Strategy for Bovine TB, it is recognised that their eradication may impact the livelihood of some hunters. If necessary, management strategies used elsewhere will be considered.
Inadvertent killing of domestic pets	Approved lethal traps used in residential area are not designed to attract or kill domestic pets. Non-lethal cat traps to be used in residential areas. Gradual introduction of policies to manage long term goals in residential areas.
Community receptivity to new technologies and/or plans/policies	Communications strategy in place to educate and inform, community consultation where deemed appropriate (see 'Decision tree' in Stakeholder Engagement).
Aerial spraying or predator proof fencing	Both require Resource Consent and neither are under consideration at this time.
On site safety risks	RAMS documents to be drafted and adhered to.
Working with children	RAMS documents to be drafted and adhered to.

Predators or Pests?

Not all pests are predators, and similarly, not all predators are pests. For example, keas will predate on kiwi nests, and multiple introduced weeds are regarded as pest species. Morevoer, the relationship between pests and predators is complex. Controlling or eradicating a pest species such as rabbits changes the behaviour of predators: deprived of a food source, they seek alternatives, including endemic and native birds, reptiles, and invertebrates, many of which are rare and/or endangered. Removing gorse may also mean removing habitats used by endemic lizards (in liue of its preferred endemic vegetation).

To eradicate or even control any one species there can be no objectors on private or public land, who have the power to enforce their objections. Conversely, there are limited statutory tools available to enforce any management plans to eradicate or control a species.

Statutory mechanisms

Across Canterbury, pests are managed under the Biosecurity Act 1993, the National Pest Management Strategy for Bovine TB, and principally, the Canterbury Regional Pest Management Strategy (CRPMS), which provides a regulatory tool as part of the tool box for the management of animal and plant pests within a region. The previous CRMPS (2011-2015) did not offer enforcement tools for eradicating or controlling rats, possums, stoats, and mustelids. The CRPMS is being updated, with emphasis on preventing new pests from entering a region (biosecurity) rather than trying to eradicate existing pests. The Interim Draft CRPMS 2017-2037 lists rats, feral cats, and mustelids as 'Organisms of interest'. Feral rabbits and possums are listed as 'Pest Species'.

Interim Draft Canterbury Regional Pest Management Plan 2017- 2037

The following five programmes outlined in the Interim Draft Canterbury Regional Pest Management Plan 2017- 2037, which follows the direction set out in the National Policy Direction for Pest Management 2015, refers to pest management (including pest plants), not predator control. However, these programmes may be a useful starting point in helping determine achievable goal/s to control different predator and pest species in different areas around Hanmer Springs.

1. Exclusion Programme: to prevent the establishment of the subject, or an organism being spread by the subject, that is present in New Zealand but not yet established in an area.

2. Eradication Programme: to reduce the infestation level of the subject, or an organism being spread by the subject, to zero levels in an area in the short to medium term.

3. Progressive Containment Programme: to contain or reduce the geographic distribution of the subject, or an organism being spread by the subject, to an area over time.

4. Sustained Control Programme: to provide for ongoing control of the subject, or an organism being spread by the subject, to reduce its impacts on values and spread to other properties.

5. Protecting Values in Places (Site-led) Programme: that the subject, or an organism being spread by the subject, that is capable of causing damage to a place, is excluded or eradicated from that place, or is contained, reduced, or controlled within the place to an extent that protects the values of that place.

Council bylaws

Some councils have or are seeking to introduce bylaws relating to cats. For example, the bylaw on microchipping cats was passed in Wellington on 4 August 2016, to come into effect early this year. All domestic cats over the age of 12 weeks must be microchipped and the cat's microchip registered with New Zealand Companion Animal Register. Strays that have been microchipped are re-united with their owners. Non-microchipped animals are either re-homed or euthenised.

Environment Southland is proposing changes that will see a ban on all new domestic cats in the Southland community of Omaui, between Invercargill and Bluff, in addition to a number of rules and regulations in place to monitor cat ownership in the area.

Currently, there are no statutory obligations for landowners to control 'Organisms of Interest' and only limited obligations to control 'Pest Species' under certain circumstances.

Social Survey (example)

The social survey below is taken directly from *Predator Free Banks Peninsula: Scoping Analysis* by Max Curnow and Geoffrey N. Kerr (Land Environment and People Research Report No. 44 (2017). While specific to the Banks Peninsula, it could readily be adapted to a social survey of property owners and residents in the Hanmer Springs area. Note that for the Banks Peninsular, predators are defined as rats, possums, stoats, and also ferrets.

For a more comprehensive understanding of the need for and value of a social survey, see Russell, JC et al (2017) Social assessment of inhabited islands for wildlife management and eradication, Australasian Journal of Environmental Management 25:1 pp 24-42. If access to the journal is unavailable, a good discussion paper can be found here: https://predatorfreenz.org/eradication-social-impacts/

Predator Free Banks Peninsula Survey

This survey is for Banks Peninsula landholders and land managers. Results will help ascertain the feasibility of making Banks Peninsula predator free.

1. What is the approximate total area of your Banks Peninsula property? (One ha = 10,000m2 = 2.47 acres)

Ha: _____

2. If the costs and methods were acceptable to you, would you support making Banks Peninsula predator free? (*Under this scenario, predators are defined as rats, possums, ferrets and stoats*)

a) Yes (*go to question 3*)
b) No (*go to question 6*)

3. Why do you support making Banks Peninsula predator free? *(Circle all that apply*)
a) I want to increase tourism on Banks Peninsular
b) I want to increase the abundance of native animals on Banks Peninsula
c) I want to prevent the spread of disease from predators to livestock on Banks Peninsula
d) I support making Banks Peninsula predator free for other reasons
e) Other (please specify): _____

4. Would you be willing to volunteer your own time to help achieve the goal of predator free Banks Peninsula?
a) Yes (*go to question 5*)
b) No (*go to question 6*)

5. How much of your own time are you willing to volunteer per year to help make Banks Peninsula predator free?
Days per year: _____

6. Do you currently do predator control on your property?
a) Yes *(go to question 7*)
b) No (*go to question 9*)

7. Which of the following species are currently subject to control on your property? (*Circle all that apply*)
f) Rats
g) Possums
h) Stoats
i) Ferrets
j) Weasels
k) Feral cats
l) Hedgehogs
m) None of these

Social Survey (example continued)

8. Which of the following methods of predator control are used currently on your property? (*Circle all that apply*)

a) Conventional kill traps
b) Self-resetting kill traps
c) Toxic bait stations/bags
d) Hand broadcast toxic baits
e) Shooting
f) Other (*please specify*):_____

9. How desirable to you is removal of each of the following species from Banks Peninsula?

	Rats	Possums	Stoats	Ferrets	Weasels	Feral cats	Hedgehogs
Very desirable							
Moderately desirable							
Slightly desirable							
Not desirable							

10. How acceptable to you is the use of each of the following predator control methods on Banks Peninsula?

	Conventional kill traps	Self-resetting kill traps	Poison bait stations/bags	Aerial broadcast poison	Hand broadcast poison	Predator-proof fences	Genetic engineering	Shooting
Very acceptable								
Acceptable								
Neutral								
Unacceptable								
Very unacceptable								

Social Survey (example continued)

11. Which of the following methods of predator control (if any) would you permit on your property? (*Circle all that apply*)

a) Conventional kill traps
b) Self-resetting kill traps
c) Toxic bait stations/bags
d) Aerial broadcast toxic baits
e) Hand broadcast toxic baits
f) Shooting
g) None of these

12. Do you think aerial broadcast of 1080 (sodium fluoroacetate) should be used on Banks Peninsula?

a) Yes
b) No
c) I don't know

13. In relation to the use of aerial broadcast 1080 on Banks Peninsula, which of the following statements concerns you the most? (*Circle ONE*)

a) Contamination of waterways
b) Risk to native animals
c) Risk to domestic pets
d) Risk to game animals
e) Risk of toxin persisting in the environment for long periods
f) The inhumane manner in which the toxin kills
g) The indiscriminate manner in which aerial broadcast 1080 is applied
h) None of these statements concerns me

14. Do you think poison bait stations containing brodifacoum should be used on Banks Peninsula?

a) Yes
b) No
c) I don't know

15. In relation to the use of toxic bait stations containing brodifacoum on Banks Peninsula, which of the following statements concerns you the most? (*Circle ONE*)

a) Contamination of waterways
b) Risk to native animals
c) Risk to domestic pets
d) Risk to game animals
e) Risk of toxin persisting in the environment for long periods
f) The inhumane manner in which the toxin kills
g) None of these statements concerns me

16. Comments: _____

_____

_____

(End of social survey)

Part B:3 Working together as a community

Background and Purpose

Stakeholder identification and engagement is a process that flows from a problem being identified by a person, group, or organisation aiming to resolve that problem through engagement with everyone who has a 'stake' in the outcome. In this instance, the New Zealand government has responded to the problem of predators, through the nation-wide 'Predator Free 2050' campaign. All New Zealanders are stakeholders because the environmental, economic, social, and cultural impacts of predators affect everyone at some level, both now and in future generations. The 'Predator Free 2050' campaign is designed so that it can be adopted in different ways according to the needs and capacities of individuals, groups, organisations, and locations.

One of the goals of the Te Tihi o Rauhea Hanmer Springs Conservation Trust and the Department of Conservation is for the 'Predator Free 2050' campaign in Hanmer Springs to become a 'whole of community' campaign. The processes used to identify and engage stakeholders in the early stages of the project, will enable different phases to be downscaled, upscaled, or redirected according to changing resources and priorities.

The purpose of this section is to assist the governance and managers of the project to work successfully with the community by identifying and engaging stakeholders, and the decision-making process to implement them. This section is set out in five parts (plus references at the end) and includes a list of possible stakeholders.

Types of stakeholders: potential and key

Each stakeholder, be it an individual or group, brings different knowledge, perspectives, and resources. Thus, accurate stakeholder identification enables a broader and fuller understanding of the issues and range of potential effects, risks, benefits, and assets associated with the project. If stakeholders are omitted or marginalised, the outcome can be less than ideal. Similarly, the emergence of new stakeholders after the project is underway can lead to new information that may be detrimental and/or costly not only because it may present hurdles, but because it could open previously unforeseen avenues that, if identified sooner had the potential to save time and resources. Thus, early identification of all potential stakeholders and a method for identifying potential future stakeholders at each stage is crucial to maximise the potential of the project and reduce risks including interpersonal/social conflicts and economic risks.

The term 'key' stakeholder (sometimes refered to as 'relevant' in the literature) refers to those stakeholders deemed crucial at different stages of planning and implementation. Engaging stakeholders who have no knowlegde or capacity for input for specific goals will almost always cause delays in determining and implementing those goals. This because such stakeholders may not have the expertise, or may seek to introduce inon-relevant mpediments to achieving the goal.

For example, someone with no knowledge of trapping or the physical characteristics of an area to be trapped is not a 'key' stakeholder in designing a trapping plan. If during the design phase it's revealed that the proposed trapping plan crosses that person's property, has a potential (positive or negative) impact on their business, or is in a public space that they use, for example, walkways, playgrounds etc., they become a 'relevant stakeholder'.

Where another goal is to seek volunteers to install and/or check traps, all local residents should always be regarded as 'potential' stakeholders. Those who volunteer and become part of the trapping group become 'relevant' stakeholders.

Identifying and engaging with key and potential stakeholders is not a one-off event. It is ongoing and indeed integral to an adaptive management approach to all projects. Thus it should be repeated following the completion of project goals or following re-evaluation of goals if they are failing or reveal new directions or opportunities. This process should not be onerous if all potential stakeholders are identified early.

Recognising and working with stakeholders

The following points should be considered when developing a potential stakeholder list and inviting them to register their interest:

- Not everyone will recognise themselves as stakeholders
- Those who do may not have the capacity to register themselves as such
- Some stakeholders may be adversely affected but may not have enough power/knowledge to influence decisions (the most overlooked group are generally the next generation)
- Conversely, some may have the power to influence change, but are not as important because the issue does not affect them as strongly (for example, elected officials not living in the area)
- Not all stakeholders have the same 'relevance' at each stage
- Identifying those who are likely to be relevant at different stages of the project can only be undertaken after all potential stakeholders are identified
- Relevant stakeholders at each stage must be enabled so that they can engage in meaningful discussion
- Some stakeholders/groups may not get along with one other. This is likely to:
    - lead to delays
    - lead to better understanding/problem solving and outcomes
    - [may] require mediation
    - [in spite of mediation, may still] result in one or more stakeholders feeling alienated. This can also come about when a stakeholder or group is misinformed or misunderstands that other interests may have legal priority over theirs
- While some individuals or groups that do not have a direct 'stake' on the project may not be seen as traditional 'stakeholders', they may be/come 'resources' and are thus regarded as stakeholders as opportunities and needs arise. For example, commercial trap makers have a 'stake' in being paid. Experimental trap makers offering to test new products have a 'stake' in product feedback.

Potential stakeholder 'groups'

As discussed above, not all 'potential' stakeholders may be 'key' stakeholders at different stages, while some may have different levels of relevancy. The following list is neither exhaustive nor exclusive, and no priority is assigned to one group over another; the numerical order is merely to assist in sorting the groupings.

Government/tribal council

National

- Ministry for the Environment Manatu mo te Taiao
- Department of Conservation Te Papa Atawhai
    - Predator Free 2050 programme (*http://www.doc.govt.nz/predator-free-2050*)
- Land Information New Zealand (LINZ)
- Ministry for Primary Industries Te Manatu Ahuwhenua, Ngaherehere
    - Forestry
- Department of Internal Affairs Te Tari Taiwhenua (potential funding)

Regional

- Te Runanga o Kaikoura
- Environment Canterbury
    - Biodiversity
    - Planning
    - Resource consents
    - (possible resource: property information/ Canterbury Maps)
- Department of Conservation
    - Regional Canterbury conservancy
    - Nelson conservancy
    - Canterbury Aoraki Conservation Board

Government/tribal council cont.

District

- Hurunui District Council
  - Hurunui Tourism
  - Youth Council
- (ECan) Canterbury Water
  - Hurunui/Waiau Zone Committee
  - (possibly) Canterbury Water – Kaikoura Zone Committee

Local

- Hanmer Springs Community Board

NGOs & special interest groups

- Predator Free NZ Trust (*https://predatorfreenz.org*)
- Forest & Bird
- QEII National Trust
- Canterbury Environmental Trust
- Fish & Game
- New Zealand Conservation Trust
- Greenpeace
- BRaid (if future trapping areas include braided rivers)
- TB Free New Zealand
- Other charitable trusts and philanthropic group/s such as NEXT Foundation (national) and Rata Foundation (Canterbury)

Industries and Industry Groups/Organisations

- Predator Free 2050 Ltd (*http://pf2050.co.nz/*)
- Forestry New Zealand
- Ecological consultants such as Wildlife International Limited, Wildlands, Boffa Miskell, etc
- OSPRI (TBFree)
- Federated Farmers
- Dairy New Zealand

Political parties and politicians

- MP for Kaikoura – currently Stuart Smith National
- Minister for Conservation – currently Eugene Sage Greens
- Minister for Tourism – currently Kelvin Davis Labour

Local or affiliated businesses and commercial operators

- Forestry
  - Rayonier
  - Ngāi Tahu Forestry
- Tour operators
- Tourism services including Hanmer Springs Pools and Spa
- Hotels, motels, holiday parks, holiday home managers
- Restaurants, bars, cafes
- All other retail outlets and services
- Veterinary services
- Agri-industry, such as farm machinery, fertilizer, pesticide, and seed sales and services (potential sponsors)

Scientific, educational, and research institutions including universities and vocational training institutes

- Hanmer Springs School (projects such as tracking tunnels; aspects can be incorporated into curriculum; fund raising etc)
- New Zealand's Biological Heritage National Science Challenge (*http://www.biologicalheritage.nz/*)
- Landcare Research
- NIWA
- Universities (research: opportunities + information resources)
- Technical /trades (eg trap building, pest management certification)
- DOC or 3rd party training programmes (eg trapping courses)

Local community groups

- Hanmer Springs Track Network Group
- Hanmer Springs Community Trust
- Hanmer Springs Search & Rescue
- Lions Club
- Conservation and trapping groups already working in the district
- Boy Scouts/ Girl Guides / Boy's Brigade
- Ski/snowboard club

Residents

- Ratepayers and/or their legal representatives (property managers / estate agents)
- Tenants

Media

Local, regional and national media are technically regarded as stakeholders. They serve a key role in the facilitation and dissemination of information, and aid the transparency of the process.

Likeminded groups elsewhere in New Zealand

Other groups aiming to make their area 'predator free' are not 'stakeholders' in the traditional sense, however identifying them and sharing information creates important strategic alliances and information pools that will help refine and improve long-term outcomes.

Levels of Engagement; which stakeholders, when?

At the outset, the 'problem' is broad: which area/s around Hanmer Springs are suitable to adopt the Predator Free 2050 campaign? Consulting a wide range of stakeholders will reveal those interested and willing to examine the problem in more detail, revealing a sub-set of problems and goals that need/can be addressed through sub-groups of stakeholders. Each sub-group can them be engaged in different ways, according to the desired outcome. This depends on:

Commitment and clarity – be clear about the problem/goal/desired outcome. In the first instance, the goal is broad. As the project progresses, the goals will become more refined.

Time and group dynamics – allow enough time to ensure relationship building dynamic. This will reduce conflict where the interests of some stakeholders may be polar opposites, for example, the desire to remove all predators may conflict with possum fur harvesters whose livelihood may depend on maintaining possum numbers to economically viable levels.

Representivity – identify how to best represent the needs and constraints of stakeholder groups, for example, absentee home-owners.

Transfer of skills – stakeholders will gain knowledge from one another over time.

The level of stakeholder engagement (and thus success of achieving goal/s) will depend upon the complexity of the problem, existing knowledge to solve it, and previous levels and types of engagement. The types of stakeholder engagement are outlined below. These are not set out sequentially or in any order of preference. Large-scale projects or those over long time frames generally use several levels of engagement based on the specified goals: what is trying to be achieved?

Stakeholder Management: all stakeholders have equal influence on management and decision-making.
Risks: can result in delayed or no action if stakeholders are unable to find common ground, or one stakeholder alone can veto any action.

Direct Involvement: stakeholders are actively involved in decision-making processes but not in day-to-day management unless they have been appointed to enact decisions based on their level/s of expertise.

Participation: negotiation between the stakeholders. This gives each stakeholder or stakeholder group time to understand other perspectives and to transfer skills.

Consultation: advice/ideas sought from stakeholders, followed by a decision made on their behalf.
Risks: Ideas and opinions are submitted with limited or no knowledge of other stakeholders' conflicting perspective/s, opposing objectives, or values. Decisions may been disputed and regarded as 'unfair' by some stakeholders that feel their point of view was not given equal (or any) consideration. To limit this problem, the decision-making process must be transparent and justifiable, and all submissions should be made publically available.

Information: stakeholders are kept informed, but are not given the chance to express their views. Should only occur when the knowledge how to solve a defined problem is known and/or agreed upon.

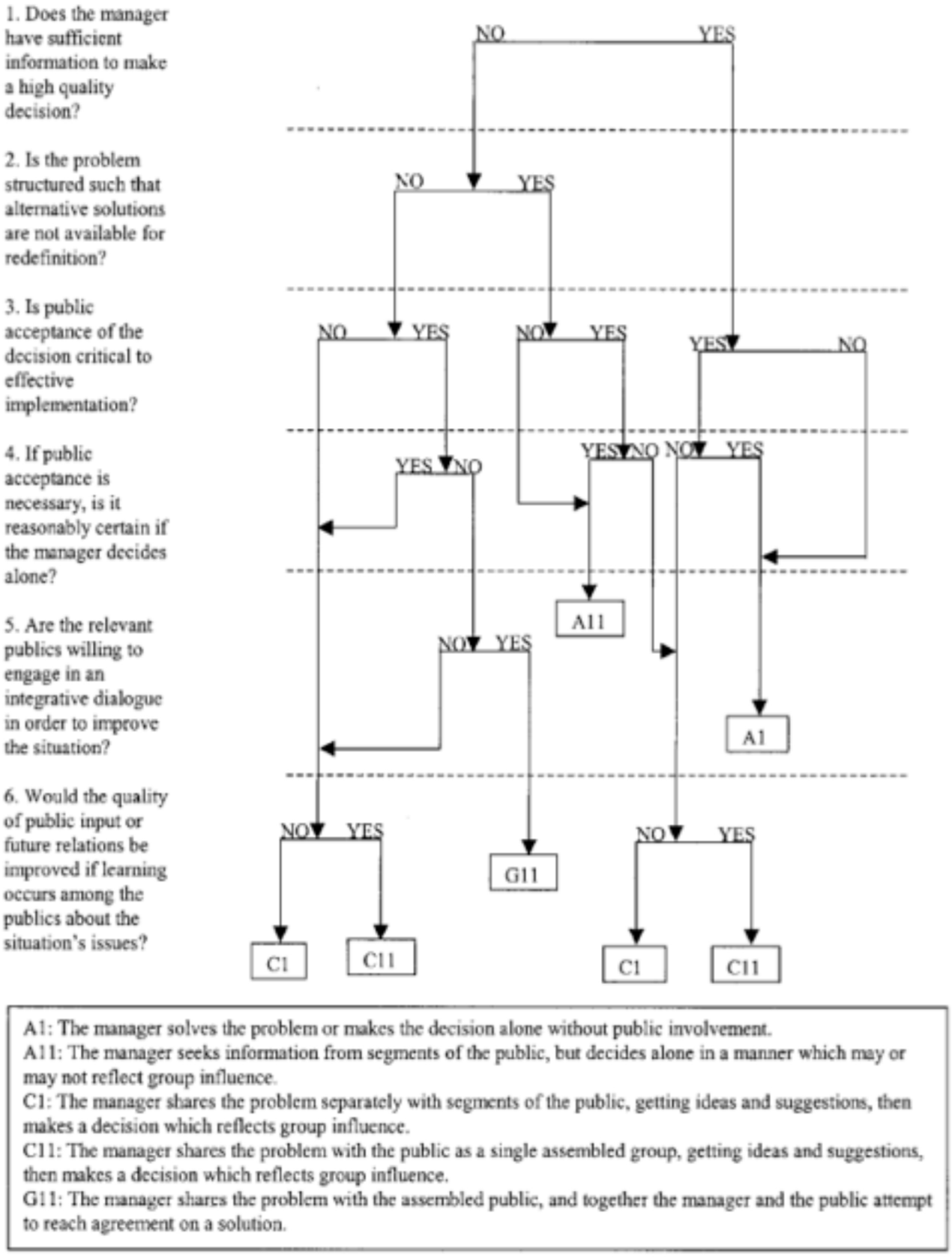


Figure 2: A decision tree for stakeholder engagement in solving natural resource problems.(Ref: Lawrence and Deagen (2001), derived from Vroom and Yetton's 1973 model). There are many such models; this is one of the most straightforward.

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Part B:4 Environmental Accreditation - working with local businesses and organisations

Background and Purpose

Globally, there is an increasing demand for sustainable and environmentally friendly products. Businesses that can meet this demand have a competitive market edge. Hence, gaining accreditation for environmental stewardship is simply good business. With the goal of creating buy-in from businesses for their involvement in Predator Free Hanmer Springs, this document outlines the concepts of sustainable development and how awarding environmental accreditation benefits businesses. It does not offer a full complement of accreditation standards; rather it explains the principles and cites examples.

Definitions

Sustainable development is defined as something that improves the quality of human life while living within the carrying capacity of supporting ecosystems. It is measured through triple bottom line (environmental, economic, and social) accounting. Under the Treaty of Waitangi culture is a fourth bottom line; thus, sustainability in New Zealand refers to quadruple bottom line accounting: environmental, cultural, social and economic.

Environmental Management Systems (EMS) are used to assess and implement sustainability. In the Tourism sector, it includes elements such reduction of greenhouse gasses, waste minimisation, and quantifiable actions that contribute to the protection and restoration of biodiversity.

EMSs vary between industries. **In all industries, the core of any EMS should be the environment.** This because cultural, social, and economic benefits hinge on a liveable and healthy environment. In reality, economic development almost always dominates the equation (after all, businesses exist to make money) and the term 'sustainability' is often hijacked or misused. This is known as 'greenwashing'.

For example, irrigation is often cited as 'crucial for New Zealand's economic development' and for 'creating jobs' and thus is needed for the sector to be 'sustainable', however these refer only to economic and social bottom lines. The cost of degraded water is externalised (transferred to the environment and society) with concurrent degradation of taonga species and the mauri of waterways, clean drinking water (cost of treatment), and recreational amenity values. **By definition this is not sustainable development.**

Sustainability Reporting. Once an organisation implements an EMS (using agreed upon benchmarks relevant to its industry) it can be audited to assess its progress in meeting those benchmarks. Upon reaching them, different levels of accreditation can be awarded. In New Zealand, sustainability reporting requires audited quadruple bottom line accounting by a certified auditor.

The United Nations Global Sustainable Tourism Council for destinations has clear benchmarks including the following (*https://www.gstcouncil.org/en/gstc-criteria/criteria-for-destinations.html*).

SECTION C: Maximize benefits to communities, visitors, and culture; minimize negative impacts [cultural and social bottom lines]

SECTION D: Maximize benefits to the environment and minimize negative impacts [environmental bottom line] (see Figure 1 on the following page).

Tourism New Zealand/Qualmark Enviro Awards

These are based on those of the United Nations Global Sustainable Tourism Council. They were developed in consultation with NZ tourism operators and are recognised and highly respected globally, particularly in the way they were developed through stakeholder engagement processes. However, attaining Qualmark Awards can be outside the capacity of many tourism operators. Further, many businesses that depend on tourism may not be regarded as tourism operators. This is particularly true of most 'main street' businesses in Hanmer Springs. Moreover, some

D1 Environmental risks The destination has identified environmental risks and has a system in place to address them.	IN-D1.a. Sustainability assessment of the destination within the last five years, identifying environmental risks IN-D1.b. System in place to address identified risks
D2 Protection of sensitive environments The destination has a system to monitor the environmental impact of tourism, conserve habitats, species, and ecosystems, and prevent the introduction of invasive species.	IN-D2.a. Maintained and updated inventory of sensitive and threatened wildlife and habitats IN-D2.b. Management system to monitor impacts and to protect ecosystems, sensitive environments, and species IN-D2.c. System prevents the introduction of invasive species
D3 Wildlife protection The destination has a system to ensure compliance with local, national, and international laws and standards for the harvest or capture, display, and sale of wildlife (including plants and animals).	IN-D3.a. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) IN-D3.b. Regulations and standards for controlling harvesting or capture, display, sale, of plants and animals
D4 Greenhouse gas emissions The destination has a system to encourage enterprises to measure, monitor, minimize, publicly report, and mitigate their greenhouse gas emissions from all aspects of their operation (including emissions from service providers).	IN-D4.a. Program to assist enterprises to measure, monitor, minimize, and publicly report greenhouse gas emissions IN-D4.b. System to assist enterprises to mitigate greenhouse gas emissions

Figure 1: The United Nations Global Sustainable Tourism Council Section D: protection of sensitive environments (highlighed in yellow).

'Predator Free Hanmer Springs' Accreditation

The following is a standard from Qualmark that could be adapted for Hanmer Springs

√ *Evidence of significant contribution towards community and/or conservation activity relevant to business size*
- *o Contribution to a community or conservation activity is more than "writing a cheque".*
- *o It involves active participation, with a contribution of time and effort.*
- *o The operator should have an understanding of how these efforts improved the local community/ environment.*
- *o The level of significance will be relevant to the size and type of operator.*

√ *Evidence that an Environmental & Social Responsibility Tourism Statement is engagement publicly displayed to encourage customer engagement*
- *o Statement is to be publicly displayed and invite/allow the customer to engage and be involved if desired*

‘Predator Free Hanmer Springs’ Accreditation cont.

An example for retail outlets that do not sell tours could be:

o Display of ‘membership’ logo of Predator Free Hanmer Spring in conjunction with:
o Display of material outlining the purpose and goals of Predator Free Hanmer Springs
o Donation box with tiered level of donations, eg:
- *Your donation of $10 will purchase X baits for Y traps for 1 month*
- *Your donation of $25 will purchase X baits for Y traps for 1 month*
- *Your donation of $75 will purchase 1 trap*

o Contact information inviting sponsoring for larger scale projects (to be listed)

Setting standards: the following is an example of the Gold Qualmark Award:

√ *Evidence that the business is taking a proactive role and is an exemplary advocate of responsible tourism*

o The business needs to demonstrate clear actions, initiatives and strategies that foster a forward thinking attitude towards their environmental stance; and have an appreciation of continual improvement to stay at the forefront of opportunities.

o Exemplary advocates of Responsible Tourism will demonstrate clear leadership within the community and be a stalwart in ensuring the best solutions in sustaining the environment and environmental causes.

The above examples are intended only to illustrate how environmental accreditation specific to Predator Free can be developed and used to engage the broader Hanmer Springs community. It is recommended that one of the goals for Predator Free Hanmer Springs is to develop a set of environmental standards that encourage small businesses to become involved. To this end, it would be useful to develop accreditation standards specific to Predator Free Hanmer Springs. These can be awarded to any business or organisation that meets those agreed-upon standards.

Part B:5 Communications & Marketing

Background and Purpose

Communications and marketing are often overlooked in the volunteer sector, and yet they are fundamental in harnessing and retaining resources, building on successes, transferring knowledge and skills, enabling actions, advocating causes, and achieving goals. A good communications plan uses the same strategies as storytelling:

1. Why (what is the desired outcome of the message)

2. Who (the message is targeting: the audience)

3. What (the message needs to be tailored to suite the audience and thus achieve the desired outcome)

4. How (method/strategy for delivering the message to the targeted audience given existing resources and budget)

5. When (timing is everything; too soon and the audience may lose interest, too late and the audience misses the event or point of the message)

Procedure

A communications strategy is embedded into the Trust's objectives:

- *To encourage co-operation between all parties whose interests and activities are involved in conservation projects in Hanmer Springs*

- *To facilitate collection, storage and sharing of data and information on conservation projects in Hanmer Springs in amongst all interested parties and organisations.*

1. Why

For community conservation groups, the first campaign ('why') generally is to attract volunteers and supporters. Subsequent campaigns aim to retain them and to achieve goals through education and events.

a. Recruitment (the desired outcome being volunteers)
b. Retention (the desired outcome being keeping them)
    i. Events
    ii. Education
    iii. Celebration of outcomes/goals being met

2. Who

Key governance individuals/stakeholders already are part of the Trust, so these do not need to be targeted.

For 'predator free' trapping programme to be successful in an urban setting, sufficient residents and/or property managers need to be recruited and retained over a long period, in 'hub' areas. These people can be regarded as:

a. Key individuals/stakeholders that can influence and/or enable a larger number of people, and/or are reliable enough to manage several traplines themselves. In a communications' network these would be referred to as 'nodes' or 'hubs'. They should include business owners or managers of residents (see **Stakeholder Engagement** in the previous section)

b. Other individuals that belong to one or more of these networks/ traplines

Procedure continued

c. Other groups and individuals who wish to contribute in other ways (including temporary residents and visitors). For example:

- Building traps
- Setting out and checking tracking tunnels
- Monitoring biodiversity outcomes
- Contributing high quality photography
- Contributing articles
- Fund raising
- Contributing other skills
- Not part of PFHS, but part of the Trust's overarching goals:
  - o Assisting with preparation and planting
  - o Weeding

d. Everyone else (including residents, business owners, and visitors). They may have no interest in, capacity, or willingness to assist, however they need to be engaged at some level. Communicating to the community is also about engaging them so that the entire community can become proud of what is being achieved. This increases their willingness to participate in the Trust's broader goal of restoring biodiversity by:

- Behaving responsibly (not dumping exotic vegetation or animals; not feeding feral animals)
- Reporting problems or concerns (seeing dumped rubbish, broken traps, suspect behaviour such as vandalism or possible smuggling, problems on tracks etc)
- Being responsible pet owners (micro-chipping and de-sexing cats and dogs, keeping dogs on leash, not releasing unwanted pets into the wild)
- Planting natives rather than exotics

3. What

The ultimate goal is for a 'critical mass' of engagement, so that being part of 'Predator Free Hanmer Springs' is regarded as a normal part of living and/or working in Hanmer Springs area. To reach that goal, different messages need to be created and delivered to different audiences (**a, b, c, and d** above). A generic 'feel good about doing something for the environment' may work to a certain extent, but data from community and non-government organisations (NGOs) shows that volunteerism in NZ is in sharp decline . The reasons for this are complex and varied, but are strongly linked to an aging membership and poor recruitment, particularly of younger members. Lack of recruitment leads to diminished capacity, and ultimately to the group disbanding.

Put another way, community and conservation groups are like species. Lack of recruitment from younger generations combined with a lack of nurturing skills (retention of members and succession planning) results in population crash and ultimately, extinction.

Secondly, research shows many students who enrol in first year undergraduate ecology courses—paying money, even going into debt to take these courses—can't correctly identify native species . The implications for the general population's knowledge of ecology is alarming. Before you can get people to become emotionally invested in something (emotional investment drives behaviour), they need to understand why they should care. That starts with at least knowing what to care about: education.

Procedure continued

4. How

Driven by points **1-3** above and dependent in on resources (financial and human).

Education / community engagement

- Display materials
  - o Brochures (portable)
  - o Posters (portable)
  - o Temporary signage (may be seasonal)
  - o Permanent signage (educational/interpretation)
  - o Taxidermied predators (hands-on understanding)
  - o Trapping workshops
  - o School visits
    - Tools to assist schools and students to engage include educational resources, for example this is a 28-page interactive resource for teachers (an iPad version is also vailable): *http://braid.org.nz/wp-content/uploads/2016/06/The-Flock-BRaid-teaching-resources.pdf*
    - Children-generated brochures and books: eg *http://sonnywhitelaw.com/moko/*
    - Hands on project such as tracking tunnels, building weta hotels, making reptile-attracting habitats, growing mealworms as wild bird food, etc.
  - o Presentations to community groups
  - o Page on NatureSpace
  - o Website
    - Static 'pages' provide freely accessible data and information either directly or through information gateways (links) to other sites and relevant documents
    - Active 'posts': news items that also automatically links to Facebook and Twitter (sharing)
    - Regular 'newsletters' that combine editorial and news items, sent to readers that opt to sign up for them
    - Active 'event' pages on a calendar that advertise and act as gateways to relevant information
    - Feed from live webcams
  - o 'Falcon's-Kereru Lair' Project/s on iNaturalist; free plus has mobile application linked to (global) iNaturalist
    - GIS supports multiple layers such as
    - Trapping
    - Monitoring species by type
    - Ecoblitz
    - Individual projects, for example a school project to monitor tracking tunnels
    - Interactive 'what species is that' capability.

Peer knowledge sharing

- 'Falcon's-Kereru Lair' Project on iNaturalist
- Presentations at conferences
- Attending conferences
- Organising conferences
- Regular local meetings
- Peer journal articles
- Regular communications with Predator Free NZ
- Newsletters
- Social media
- Website

Procedure continued

4. How (cont.)

Press releases

- Articles
- Radio

Advertising

Commercial support through

o Accreditation (**Part B:4**)

- Promotion of accredited businesses and organisations (website, social media)
- Cross-promotional: businesses promote 'Predator Free Hanmer Springs' as part of their image/ethos

Volunteerism: Incentives/rewards

While some volunteer for selfless reasons, the reasons are mostly centred on social benefits (camaraderie), and protection or enhancement of their sense of 'place' (emotional investment). As a large percentage of the Hanmer Springs population is temporary (either temporary holidaymakers, holiday home owners, or seasonal staff) the emotional incentives may be lacking. Incentives or rewards can help overcome this. These may include (but are not limited to):

- **Free food:** a barbecue following a planting, for example
- **Free or discounted goods or services**: eg a point scheme for the number of volunteer hours worked, or discount/free coupons for purchase of items such as native plants. If there is buy in from local businesses, accumulated points can be redeemed from them (discounted/free coffee). While this takes some administering, it has the added advantage of keeping track of the number of volunteer hours for each aspect of a project/s. This is incredibly useful for writing reports, funding applications, and working out the cost-benefit relationship between inputs and results.
- Short term employees may be asked to contribute X volunteer hours as part of their employment contact. This is only possible where businesses agree to such a scheme, but would also constitute part of that businesses' voluntary contribution/partnership (see **Accreditation**)
- **Recognition for their services,** for example certificates or references (see also Accreditation)
- **Training:** eg in the use of field equipment, procedures, and/or knowledge that may better equip them for jobs
- **Accreditation:** eg, school projects
- **Positive reinforcement:** post-event communications (using options outlined above) to celebrate achievements.

5. When

The timing of communications will vary according to points **1-4** above. This needs to be considered on a case-by-case basis.

Note: the following is a detailed communications procedure developed for BRaid that can be applied elsewhere

1. Expand /update the core website as and when needed
2. Blog posts 'latest news' on website (feeds to Facebook and Twitter)
3. Add composite blog posts, calendar, and 'classifieds' to the regular e-newsletter
4. Draft newsletter
   a. Send draft to management committee for editorial input/amendments (if this procedure is needed)
   b. Redraft and send final to management community (if this procedure is needed)
   c. Send newsletter

Procedure continued

Targeted communications procedures

1. Define the message
2. Identify the targeted audience
   a. Refer to stakeholder database
3. Create message(s) for selected audience(s)
4. Determine advertising budget if needs be, and appropriate outlets. These may include local newspapers, radio, and specialist groups
5. Design advertisement
6. Make sure any web content is linked content to or created on the website. This may mean adding elements to the website such as:
   - Photos and PDFs (resize images where needed)
   - Links to Research papers or monitoring reports
   - Calendar entries
   - Finally, create a website 'post' (DRAFT in some instances) with the content of the announcement – this feeds to Twitter and Facebook
7. Send draft post to management committee (where appropriate or if required)
8. Redraft or edit as needs be
9. Deliver final message
   - Publish 'draft' page
   - Email targeted audience
   - Press releases directly to media contacts
     - Identify relevant media contacts
     - Check their deadlines for print as you may have just missed a print cycle for a weekly paper
     - Come up with a catchy title
     - Copy and past content of press release or blog to email
     - Add the link to the blog
     - Add the names and contact numbers of spokespeople
     - Offer high quality photos (include low quality in email) and photographer's name
     - You may consider offering exclusivity to one paper or outlet
     - Email *http://www.scoop.co.nz/services/publishing.html* Press releases as they go to everyone
   - Notify comms teams at DOC, HDC, ECan, Predator Free NZ etc (refer to Stakeholders list as this will depend on who the message is targeting)
10. Advertising (or advertising support) where applicable. This is an expensive options, so pick your target. This may be school newsletters in rural communities, as pretty much everyone in the community reads them.

Department of Conservation
Te Papa Atawhai

File Reference: DOC-

To: Alex Foulkes, Senior Ranger/Supervisor, Community, Rangiora Office

From: Marieke Lettink, Technical Advisor, Fauna

Date: 5 October 2018

Lizard management and monitoring recommendations for Predator Free 2050 Hamner Springs

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Context

- There is significant community support and interest in setting up a "Predator Free 2050" site in Hanmer Springs, an alpine village 130 km northwest of Christchurch in the Hurunui District.
- Phase 1 will involve setting up pest mammal control over a proposed 650-ha area that includes Hanmer Springs village, Conical Hill Reserve and the Chatterton River.
- Four species of lizard occur ≤5 km of Hanmer Springs village, including a significant population of rough gecko (Nationally Vulnerable). Its preferred habitat is indigenous shrublands and forest.
- Lizards require a higher level/intensity of predator control than native birds. Additional measures (e.g. mouse and weed control) will be required to protect resident lizard populations.

Summary of recommendations

- Survey kānuka forest and other areas with rough gecko sightings to determine if it is still present.
- Implementation of the 'Minimum Viable Pest Control' proposal designed for lizards, combined with outcome monitoring of at least one lizard species to document response to pest control.
- Protect site-specific information for rough gecko to prevent/reduce illegal collection (poaching).
- Control invasive weeds in tracts of remnant kānuka forest on Conical Hill and adjoining areas.
- Inform Hurunui District Council that kānuka forest in the Hanmer Basin is significant habitat for rough gecko. This is urgently needed because it is threatened by weed invasion and on-going clearance for exotic forestry and housing (e.g. 2014 clearance for a Conical Hill subdivision).

Background to request

"Predator Free 2050" (PF2050) in an ambitious goal to eradicate possums, stoats and rats from New Zealand by 2050 (see https://predatorfreenz.org/about-us/pf-2050/). This will involve DOC working in partnership with central and local government, iwi, philanthropists, non-government organisations, businesses, science and research organisations, communities, land owners and individuals interested in conservation. Although getting rid of these introduced pest mammals is highly desirable from economic, social, cultural and ecological perspectives, some negative outcomes are likely (Linklater & Steer 2018). For example, removal of stoats and rats is likely to increase the numbers of weasels and mice, which may result in increased overall predation pressure on native lizards (a process known as meso-predator release; Hitchmough et al. 2016a).

Te Whakatakanga o te Ngārahu o te ahi a Tamatea/Hanmer Springs is an alpine village located in the Hanmer Basin, Hurunui District. A proposal has been recently been developed to establish predator control over an area known as the "Falcon's-Kārearea Lair Conservation Area", to be implemented over several decades under an adaptive management framework (Whitelaw 2018). It is recognised that removing a subset of predators from this area may have unintended consequences for some wildlife, including reptiles; hence advice is provided on lizards in this area and measures required to protect them.

Department of Conservation
Te Papa Atawhai

Lizard fauna of Hanmer Springs

Four species of lizard (one skink and three geckos) occur within ≤5 km of Hanmer Springs village (Table 1). Of greatest conservation concern are rough gecko (Nationally Vulnerable; Figure 1) and an undescribed skink that belongs to the grass (formerly 'common') skink cryptic species complex. The latter is simply referred to as 'grass skink' here in light of uncertainty over its taxonomic identity. Both rough gecko and grass skink occur on Conical Hill (pers. obs; DOC Herpetofauna Database). Population sizes and trends of these two lizard species are unknown as there has been no formal survey or monitoring in the area.

Table 1. Lizard species known from the vicinity (≤5 km) of Hanmer Springs village (DOC Herpetofauna Database) and their conservation status (Hitchmough et al. 2016b; ranked in order of declining severity).

Common name	Scientific name	Conservation status
Rough gecko	*Naultinus rudis*	Nationally Vulnerable
Canterbury grass skink OR	*Oligosoma* aff. *polychroma* Clade 4 OR	Declining (both taxa)
South Marlborough grass skink*	*Oligosoma* aff. *polychroma* Clade 3	
Southern Alps gecko*	*Woodworthia* "Southern Alps"	Not Threatened
Minimac gecko*	*Woodworthia* "Marlborough mini"	Not Threatened

*Part of a cryptic species complex that requires further revision and formal description. Verification of the identity of the skink species that occurs in the Hanmer Basin will require genetic analysis, as the two possible taxa are very similar and species' boundaries are poorly-known. Canterbury grass skink occurs south of the Waiau River and South Marlborough grass skink is found on The Poplars Station (Liggins et al. 2008).

Figure 1. A female rough gecko (*Naultinus rudis*) from the Hanmer Basin, Hurunui District, Canterbury.

The presence of rough gecko on Conical Hill is well-known among New Zealand herpetoculturists (lizard keepers). Many of the 100+ individuals of this species in captive collections nationwide are likely to have been bred from wild-caught ancestors collected from Conical Hill in the 1970s (at which time it was still legal to do so). Given that New Zealand geckos can live for at least 53 years (DOC Unpubl. data), it is possible that some rough geckos that were collected from Conical Hill in the 1970s are still alive today!

Conical Hill and the surrounding area have undergone major changes in land use over the last century, including afforestation with exotic plantation forest, logging and increased housing developments. Of particular concern for rough gecko is the on-going clearance and degradation of remnant kānuka forest. For example, I observed a bulldozer clearing mature kānuka forest on the south-western flank of Conical Hill on 3 April 2014. This is highly likely to have killed rough geckos because this area contained some of the best remaining habitat available for rough gecko on Conical Hill. I revisited this area on 29 September 2018 and encountered a sign advertising four sections as part of a new housing subdivision. Other threats in this area are predation and weed encroachment (including broom, cotoneaster and wildling conifers).

Recommendations for the conservation of lizards at Hanmer Springs

The following are recommended to protect and enhance lizard populations at Hanmer Springs:

1. Survey kānuka forest and other areas with rough gecko sightings to determine if it is still present. This should be done by a lizard expert because this species is very difficult to detect, especially in tall and/or closed canopy forest. Targeted low-key advocacy (e.g. an article in the Hurunui News or similar) may be useful for recruiting recent sightings of the species from members of the public.
2. Implementation of the 'Minimum Viable Pest Control' proposal designed for lizards[1], combined with outcome monitoring of at least one lizard species to document response to pest control. This will require control of possums, cats, mustelids, hedgehogs, rats and mice (using rodent bait stations). Some modifications will be required (e.g. cats in urban areas cannot be controlled using lethal traps).
3. Protect site-specific information for rough gecko to prevent/reduce illegal collection (poaching). Unfortunately, rough geckos are highly-sought after by international wildlife traffickers for supply to the pet trade and advertising their presence (e.g. on internet sites) is likely to attract poachers.
4. Control invasive weeds in tracts of kānuka forest on Conical Hill and adjoining areas (e.g. the hill c. 1 km SW). Weed encroachment (e.g. by broom, cotoneaster, blackberry and wilding conifers) is an on-going threat to remnant kānuka forest, particularly along edges following clearance or disturbance.
5. Inform Hurunui District Council that kānuka forest in the Hanmer Basin is significant habitat for rough gecko. This is urgently needed because the remaining habitat is threatened by weed invasion and on-going clearance for exotic forestry and housing (e.g. 2014 clearance for a Conical Hill subdivision). Further housing development would seem inevitable given Hanmer Springs' popularity.

References

Department of Conservation Herpetofauna Database (www.doc.govt.nz/nzherpatlas).

Hitchmough RA, Adams LK, Reardon JT, Monks JM 2016a. Current challenges and future directions in lizard conservation in New Zealand. Journal of the Royal Society of New Zealand 46: 29–39.

Hitchmough R, Barr B, Lettink M, Monks J, Reardon J, Tocher M, van Winkel D, Rolfe J 2016b. Conservation status of New Zealand reptiles, 2015. New Zealand Threat Classification Series 17. Wellington, Department of Conservation. 14 pp.

[1] The latest version of this proposal and advice on its implementation can be obtained from Dr James Reardon (jreardon@doc.govt.nz). This proposal represents an informed 'best guess' at what is required to protect lizards based on the home ranges and habitat use of various predator species. Note: has not yet been field-tested on lizards.

Liggins L, Chapple DG, Daugherty CH, Ritchie PA 2008. A SINE of restricted gene flow across the Alpine Fault: phylogeography of the New Zealand common skink (*Oligosoma nigriplantare polychroma*). Molecular Ecology 17: 3668–3683.

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Whitelaw 2018. Predator Free Hanmer Springs. Unpublished report prepared for Te Tihi o Rauhea Hanmer Springs Conservation Trust, the Department of Conservation, Hanmer Springs Community Board, Hanmer Springs Thermal Pools & Spa, and the Hurunui District Council. 8 pp.

Assyst requst R135841

Sample design and methods for monitoring the relative abundance of bird species for the Hanmer Springs Predator Free project

Planning, Monitoring and Reporting
Biodiversity Group

July 2018

Introduction

A Predator Free NZ project is currently being established at Hanmer Springs, Canterbury. A network of traps will be established in late 2018/early 2019 to control and remove selected mammalian pests. Monitoring of mammals will be done using chew-cards and/or tracking tunnels, whilst the abundance of birds will be monitored using five-minute bird counts (5MBC). This will enable assessment of the medium to long term benefits derived from sustained pest control. This document describes the recommended sample design and survey methodology for monitoring the bird community in the Hanmer Springs Predator Free (HSPF) area.

Monitoring design

The following sections describe the key principles that establish the context for monitoring proposed in this document.

Rationale

A successful monitoring programme provides clear, detailed documentation of the design decisions made. Clear articulation of objectives is required, followed by clear definition of the area over which the monitoring is required. To achieve this, a target population and sample frame must be defined (Greene, 2012). The target population is described as the population or resource of interest. The sample frame is a spatial representation of the target population. Once the target population and sample frame are defined it is important to account for any logistical constraints (such as accessibility and safe conditions for field personnel). A clear definition of the sample frame is important to ensure that the scope of inference is understood. The sample size then needs to be determined and sample units defined to provide an unbiased representation of the sample frame. This is an important concept and the key reason that sampling effort is distributed across the HSPF area, and not positioned in logistically convenient and biased locations such as near tracks and roads (i.e. convenience sampling). When choosing the sample from the sampling frame it is important that it is of

adequate size and representative so that it reflects the entire population of interest and the area over which inference can be made. Sample units need to be derived using a probabilistic method. We use Balanced Acceptance Sampling (BAS) developed under the concept of a 'master sample' of New Zealand for point selection within the sample frame (Dam-Bates et al. 2018). The benefit of using this master sample is that it provides for statistically valid comparisons between sites as well as inference at different spatial scales.

Monitoring objective

The aim is to assess changes in the relative abundance of bird species in the HSPF area and relate this to success of the mammalian pest trapping programme.

Target population

The target population for the monitoring is all bird species in the proposed HSPF area (Fig.1). The area will be divided into two broad habitat types: forest (including scrub) and non-forest (including all other habitat types, e.g. farmland and urban). Stratification of the survey area will enable monitoring of forest and non-forest bird species.

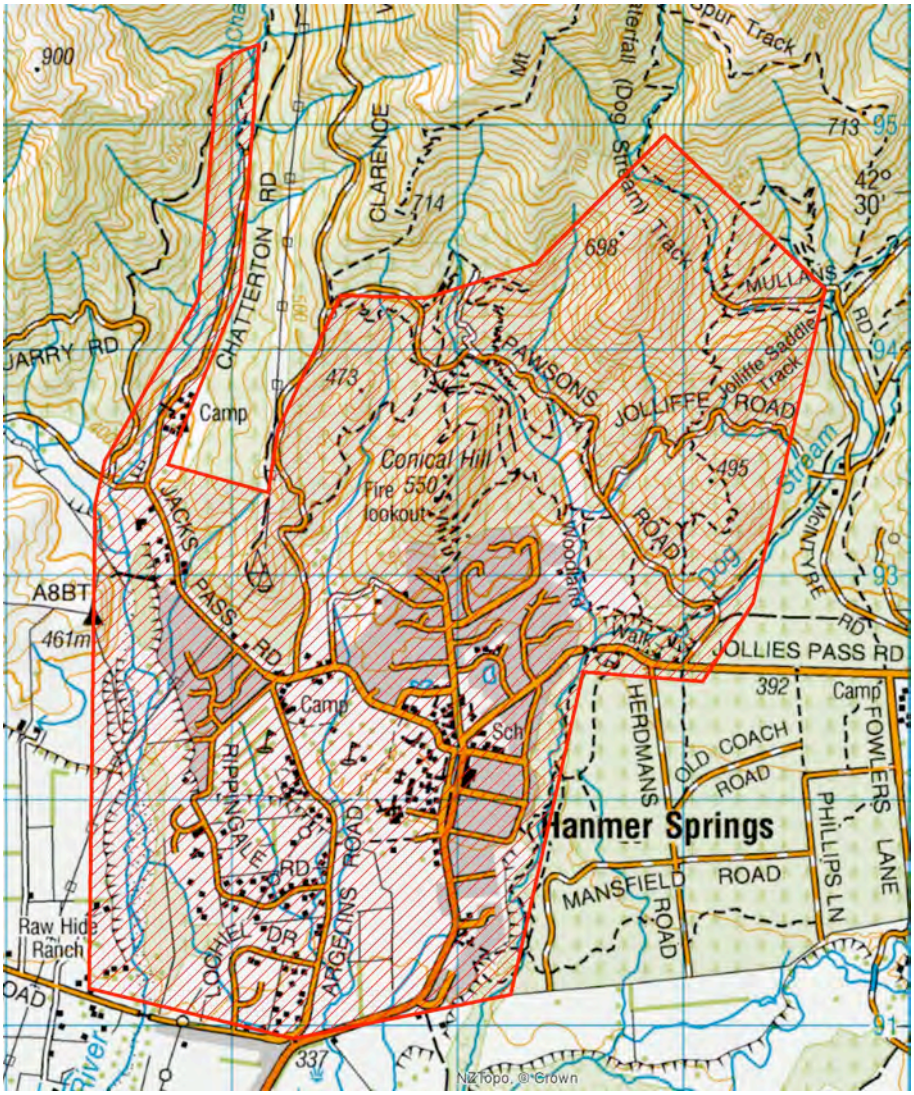


Figure 1: Proposed boundary for the Hanmer Springs Predator Free project.

Frequency and replication

We recommend annual re-survey of the 5MBC monitoring in the Hanmer Springs area in October. Annual re-survey is required to provide sufficient temporal resolution to assess changes in the abundance and distribution of forest and non-forest bird species. Variability is often greater spatially then temporally. Therefore, sample size recommendations need to consider how much effort is required to capture the spatial variability in the population of interest. Simulations of 5MBC data from other sites suggest that 30 sample points will normally provide reasonable estimates which account for spatial and temporal variability. We therefore recommend a **minimum** of 30 5MBC stations are established within each of the two broad habitat types (forest and non-forest), making a total of at least 60 5MBC stations.

Site selection

We have used the master sample to locate random sampling locations within the proposed HSPF boundary. BAS samples have a hierarchical ordering which ensures spatial balance of the resulting sample. The 5MBC points must be established according to the ordering represented by the 'site order' (see Appendix 1). A GPX file of these locations can be provided for direct upload onto GPS units.

100 sites were selected initially, however 12 of these were immediately rejected because they were too close (i.e. within 150 m) of another candidate bird count station. There are therefore 88 remaining candidate 5MBC station locations (Fig. 2). Once these have been ground-checked, some may be removed if they prove to be inaccessible, unsafe or unsuitable for any other reason. Precise positioning of a station may be adjusted to some extent, to maximum of 20 metres (e.g. to avoid nearby river noise), provided that they are not moved more than necessary and are not within 150 metres of another 5MBC station. Once 5MBC stations have been finalised, there must be a minimum of 60 (30 within each broad habitat type).

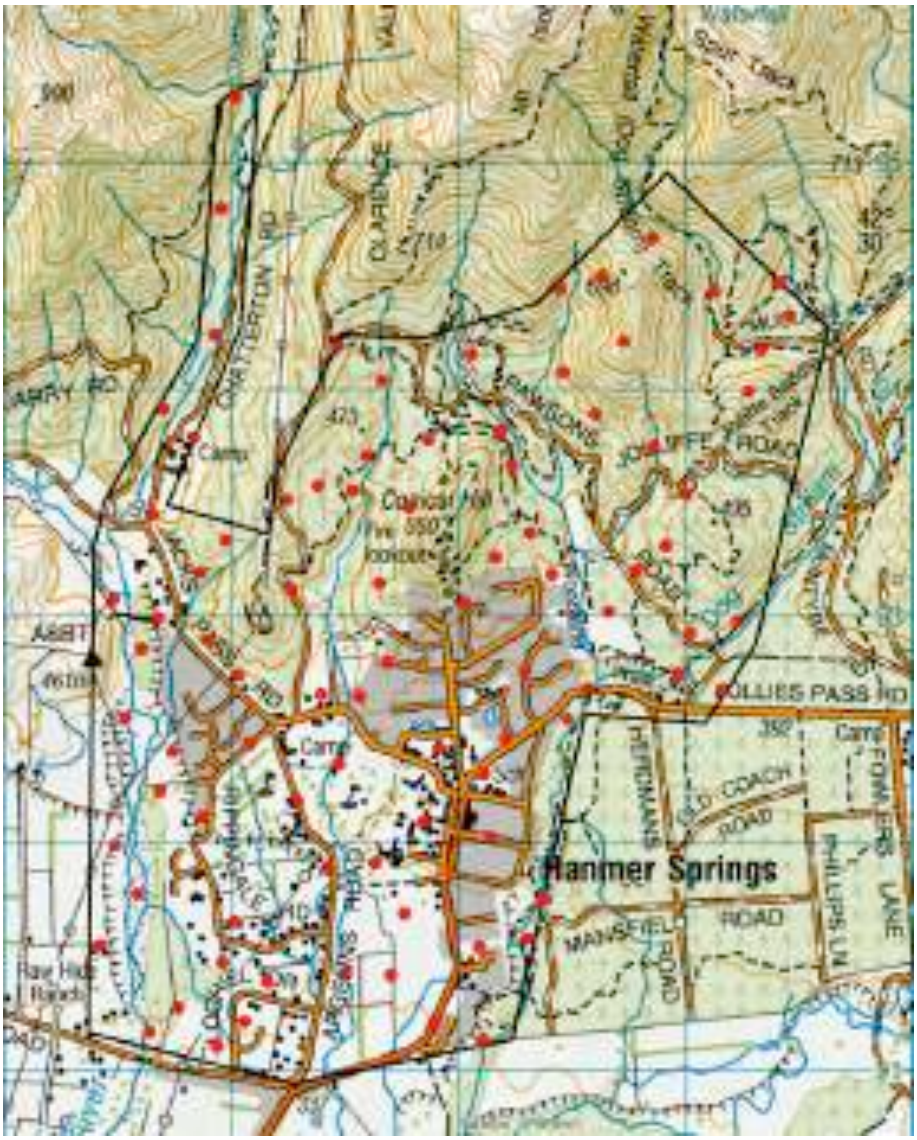


Figure 2: The 88 candidate 5MBC station locations, selected using the master sample.

Field methods

We recommend implementing monitoring using the 5-minute bird count (5MBC) method, as used in the DOC Tier 1 Monitoring Programme. This method is a modified version of the standard 5MBC method, which can give an index of abundance for all species recorded as well as a density estimate for the more commonly-recorded species. It is important to be aware of the limitations of relative indices such as 5MBC. This method is not suitable for detecting small changes over short time periods. The value is in providing medium-long term data to assess large changes in bird species abundance and composition. Field observers must be able to accurately identify the bird species found in the area, both visually and aurally, and be familiar with the use of this sampling method and the sources of variability (e.g. observer ability, weather, time of day/year, etc.).

Whenever possible, counts should begin at least 1 hour after official local sunrise and be completed by 1300 hrs (although for training purposes some counts may be completed after 1300 hrs). Counts

conducted after 1300 hrs are likely to detect fewer birds, as birds are generally less active at this time. A single bird count should be completed at each bird count station. It is important to carry out counts in good weather (i.e. avoiding extremes such as heavy rain, strong winds or fog).

Approach the bird count station quietly, to minimise disturbance to birds. Start the count immediately upon arrival at the bird count station. Record all birds seen or heard for exactly five minutes. Record a tally for each species on the record sheet (see Appendix 2), taking care to record each individual bird only once. There is also an optional diagram to map out birds, for those who find this useful. If the diagram is used, data must be transferred to the record sheet immediately after the count is finished. Ensure that all parts of the record sheet are complete before moving on to the next bird count station.

Whilst counting birds, an attempt should be made to assign each bird to a distance category (or 'bin'). There are three bins: 0-25 m, 26-100 m, >100 m. This is done so that the data may be analysed using the distance sampling software (DISTANCE), to estimate density. It is essential to recognise the assumptions that the software makes and consider these whilst recording birds. There are three main assumptions that bird counters must be aware of:

1) Birds are detected prior to movement – distance sampling analysis requires a 'snap shot' of bird positions, therefore if a bird has moved (either towards or away from the observer) before it is detected, the distance recorded may bias the results. For example, if a bird is flushed by an observer and it is obvious where it flushed from the distance recorded should be from the point of departure. If, however, a bird is has moved toward an observer and the point of origin is unknown the bird should be recorded as 'distance unknown' (see below).

2) Everything at the point is detected – this means you must not miss any birds that are at or very close to the bird count station. It is therefore importance to look up into trees or other structures at or very close to the point to check for birds that may be present.

3) Distances are correctly assigned – it is important that birds are assigned to the correct distance bin. This is usually straight-forward when there are only three bins, but care is needed for any birds close to the bin boundaries (e.g. around 25 m). A range finder is useful under these circumstances but suitable training or marking distances at a survey point will help. If the bird is heard but not seen, the observer must estimate the distance based on the call alone and this can be difficult depending on terrain, vegetation density and call direction.

All birds seen or heard should be recorded, however the distance should only be recorded when the above assumptions are not knowingly violated. If a distance cannot be assigned, the bird(s) should be recorded with 'DU' (distance unknown) and the number counted in the 'comments' box (Appendix 2).

Any birds of interest that are noted outside of the 5-minute recording period must not be included in the count but may be recorded separately as incidental records.

Recommendations

- Establish 5MBC monitoring as described in this document.
- Re-survey all monitoring locations annually at the same time of the year (October).
- Ensure observers are trained in the method and capable of accurately identifying bird species present in the area.
- Enter data immediately after collection and save in a Microsoft Excel spreadsheet as column variables (i.e. a row for each observation with each column a separate variable).
- Assess data after each re-survey to estimate relative abundance/density and distribution of bird species in the area. We recommend requesting assistance from the Planning, Monitoring and Reporting team for data analysis.
- For further information or enquiries please contact James Mortimer (jmortimer@doc.govt.nz).

References

Dam-Bates, P. van, Gansell, O., Robertson, B., 2018. Using balanced acceptance sampling as a master sample for environmental surveys. Methods in Ecology and Evolution.

Greene, T., 2012. A guideline to monitoring populations, version 1.0, in: Greene, T., McNutt, K. (Eds.), Biodiversity Inventory and Monitoring Toolbox. Department of Conservation.

Appendices

Appendix 1: Candidate bird monitoring station locations.

No. (site order)	Master Sample ID	NZTM East	NZTM North
1	South15032	1587152.336	5292677.909
2	South77240	1585460.401	5294190.398
3	South87608	1584419.21	5291551.259
4	South118712	1586100.299	5291134.553
5	South139448	1587401.788	5294468.202
6	South170552	1584697.584	5293912.594
7	South201656	1586403.98	5293183.358
8	South263864	1586902.884	5293310.685
9	South294968	1584892.807	5292893.979
10	South450488	1586180.738	5293819.992
11	South460856	1585052.782	5291215.579
12	South543800	1585378.154	5293576.914
13	South574904	1585681.834	5292797.519
14	South637112	1587449.69	5294325.441
15	South668216	1584528.571	5292554.44
16	South699320	1586625.414	5294499.069
17	South740792	1585497.457	5291431.649
18	South761528	1586777.254	5293202.65
19	South792632	1585013.014	5295286.18
20	South823736	1585779.446	5293480.454
21	South834104	1584680.411	5292230.336
22	South948152	1586200.622	5292461.839
23	South958520	1584928.056	5291107.544
24	South1010360	1587270.735	5293989.761
25	South1041464	1585253.428	5293121.624
26	South1114040	1586135.548	5292027.984
27	South1196984	1586457.305	5294076.79
28	South1207352	1585416.114	5291889.082
29	South1259192	1586847.751	5294667.123
30	South1290296	1584830.444	5293787.41
31	South1321400	1586016.245	5293058.175
32	South1487288	1585756.399	5291692.304
33	South1570232	1585590.098	5293706.384
34	South1663544	1584650.134	5293447.872
35	South1694648	1586562.599	5292683.911
36	South1756856	1586721.67	5294211.833
37	South1787960	1585073.117	5292440.832
38	South1943480	1586311.339	5293366.846
39	South1953848	1584865.241	5292116.727
40	South2067896	1585465.372	5292348.231
42	South2161208	1584670.018	5292992.582
43	South2233784	1585628.058	5291916.091
44	South2254520	1586958.468	5292749.503

45	South2285624	1584948.391	5294798.308
46	South2327096	1584579.636	5291777.189
47	South2441144	1586155.884	5293258.811
48	South2503352	1586995.524	5293536.615
49	South2534456	1585390.355	5292656.902
50	South2607032	1586294.167	5291580.411
51	South2689976	1586597.847	5293890.301
52	South2700344	1585151.749	5291390.064
53	South2783288	1584967.371	5293334.692
55	South2980280	1585887.452	5291204.861
56	South3001016	1587217.862	5292975.862
57	South3063224	1585525.927	5293554.621
58	South3073592	1584484.736	5291991.973
59	South3187640	1586473.121	5292547.581
60	South3249848	1586852.722	5293747.54
61	South3280952	1584857.106	5293191.932
62	South3436472	1586050.138	5294152.671
63	South3446840	1585008.947	5291652.434
65	South3498680	1587120.25	5294430.475
66	South3560888	1585645.343	5293145.631
67	South3654200	1584596.922	5292856.252
69	South3809720	1585858.643	5293778.407
70	South3820088	1584759.608	5291278.171
71	South3934136	1586285.242	5292759.792
74	South4100024	1586084.595	5291544.4
76	South4193336	1585282.011	5292192.609
77	South4276280	1584920.486	5294241.414
78	South4307384	1585907.448	5292418.968
79	South4317752	1584634.882	5291168.85
80	South4400696	1584475.811	5293078.753
81	South4473272	1585842.374	5292094.863
82	South4494008	1587013.714	5292928.275
83	South4556216	1585655.285	5294039.492
84	South4680632	1586653.093	5293020.877
86	South4773944	1585026.232	5292743.073
87	South4846520	1586360.258	5291755.325
88	South4929464	1586230.109	5293665.228
89	South4939832	1584957.543	5291477.521
90	South5022776	1585239.532	5293514.751
91	South5053880	1585557.673	5292646.613
92	South5116088	1587323.721	5294174.535
93	South5147192	1584735.205	5292403.534
94	South5178296	1586441.601	5294440.764
95	South5219768	1585696.86	5291419.645
99	South5427128	1586105.383	5292307.075

FIELD DATA RECORD SHEETS FOR BIRD SURVEYS

Location name: _____

Date (DD/MM/YYYY): _____

Observer(s): _____
(first & surname)
_____

Survey year:

Appendix 2: Record sheet for recording bird count data

5MBC DATA RECORD SHEET

LOCATION:		**STATION ID:**	
OBSERVER:		**DATE (DD/MM/YYYY):**	
START TIME (hh:mm):		**SUN** (Bright sun immediately overhead in minutes)	0 1 2 3 4 5

TEMP.	PRECIPITATION	WIND	OTHER NOISE
1 <0°C	0 None	0 Leaves still / move silently	0 Not Important
2 0–5°C	1 Dripping foliage	1 Leaves rustle	1 Moderate
3 6–10°C	2 Drizzle	2 Lvs/branches in constant motion	2 Loud
4 11–15°C	3 Light	3 Branches or trees sway	
5 16–22°C	4 Moderate		
6 >22°C	5 Heavy		
	M Mist		
	R Rain		
	H Hail		
	S Snow		

BIRD STATION NOTES:

STATION REMEASUREMENT: (CIRCLE) New Refound Replaced* Re-established*

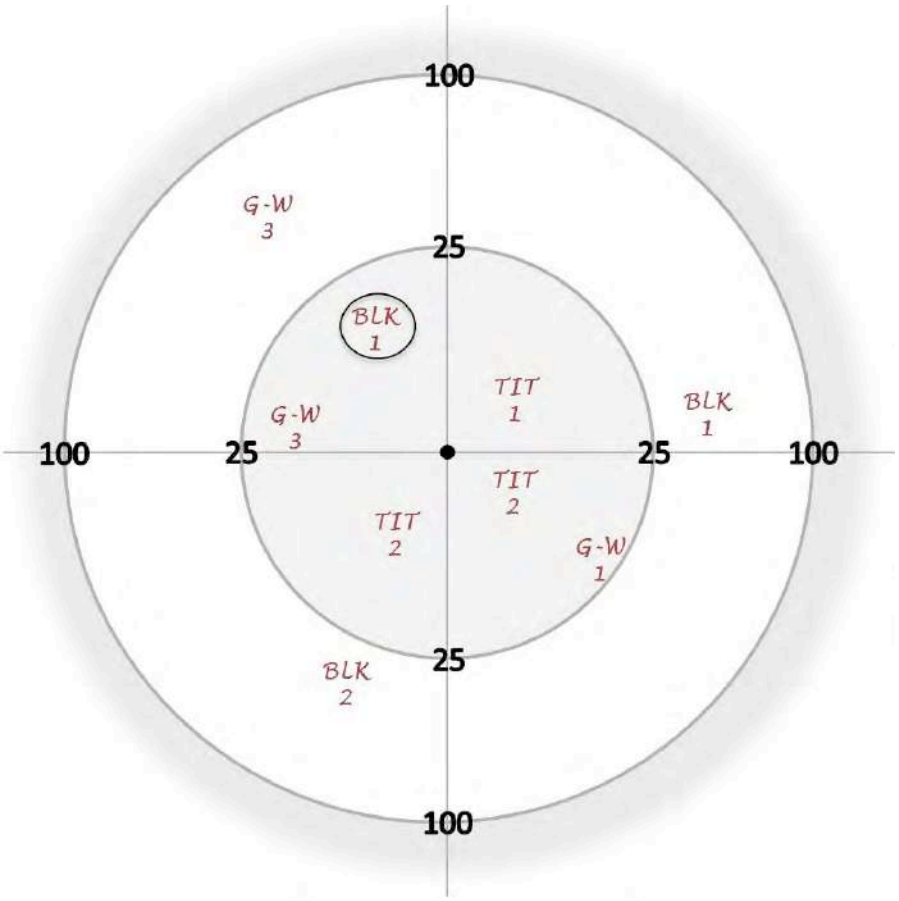
STATION NOT MEASURED: ☐ (tick)*

DIAGRAM USED (CIRCLE): Yes / No

*Reason:

SPECIES (Each line = bird species)	NUMBER OF INDIVIDUALS (5MBC) Tally of numbers			COMMENTS
	Near (0–25 m)	Far (26–100 m)	>Far (100 m+)	

Bird count diagram booklet



Location: _____

Date (DD/MM/YYYY): _____

_____

Observer(s): _____
(first & surname)

_____

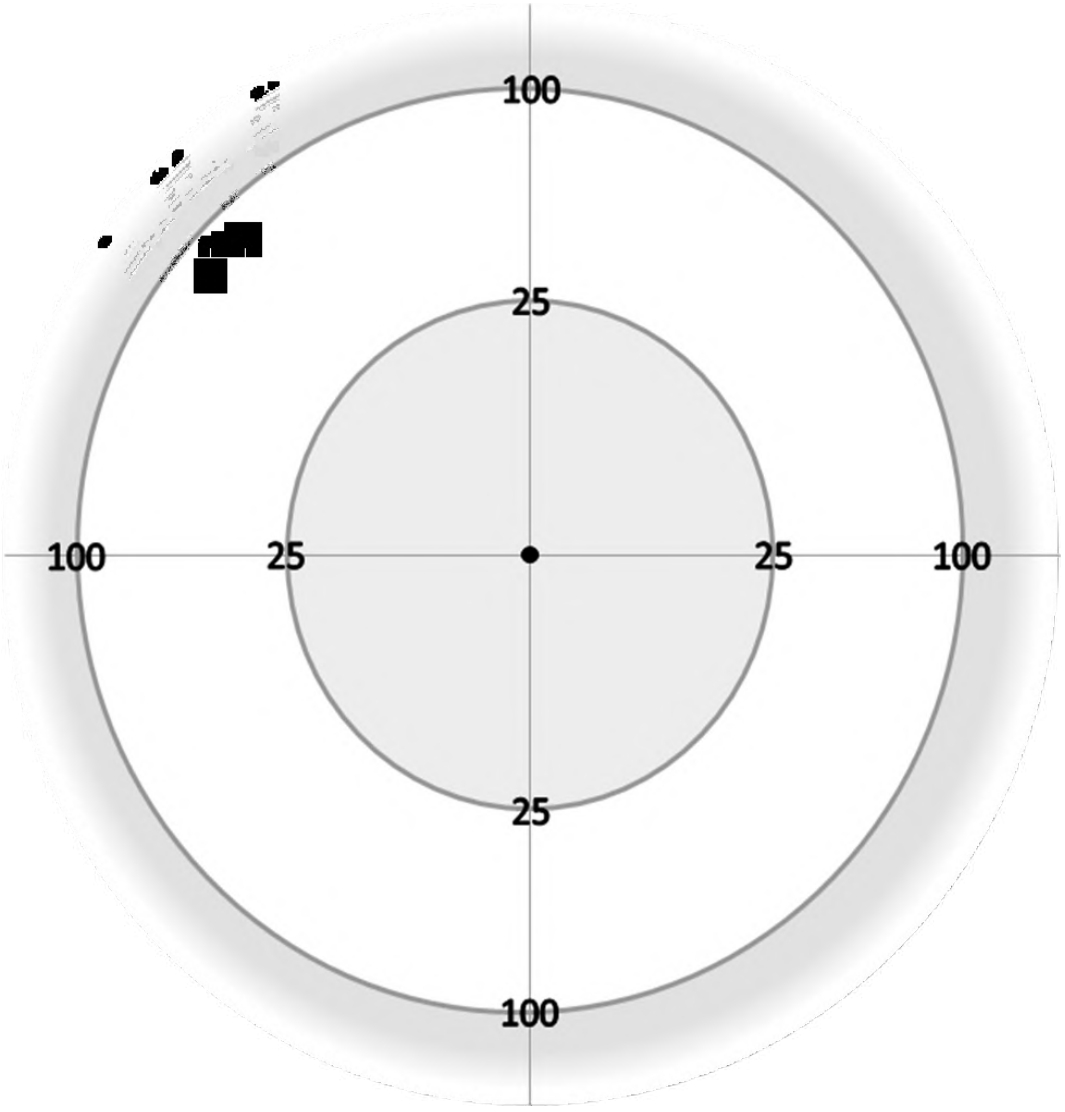
Survey year:

Appendix 3: Optional diagram for use during bird counts

BIRD COUNT DIAGRAM – 5MBC

LOCATION:		DATE (DD/MM/YYYY):	
OBSERVER:		START TIME (hh:mm):	

STATION ID:



Transpose information to FIELD DATA SHEET FOR BIRD SURVEYS before moving on to the next station.

Native birds				Introduced birds	
BBG	Black-billed Gull	PIG	Pigeon (NZ)/ Kereru	BLK	Blackbird
B-C	Brown Creeper	PIP	Pipit (NZ)	CAL	Californian Quail
BEL	Bellbird	PUK	Pukeko	C-B	Cirl Bunting
BFT	Black-fronted Tern	RBG	Red-billed Gull	C-G	Canada Goose
B-S	Black Swan	RIF	Rifleman	CHA	Chaffinch
FAL	Falcon (NZ)	ROB	Robin (NZ)	DUN	Dunnock
FAN	Fantail	R-W	Rock Wren	GOL	Goldfinch
FER	Fernbird	SAD	Saddleback	GRE	Greenfinch
G-W	Grey Warbler	SBG	Southern Black-backed Gull	HOU	House Sparrow
HAR	Harrier (Australasian)	S-C	Shining Cuckoo	MAG	Magpie (Australian)
KAK	Kaka	S-E	Silvereye	MAL	Mallard
KEA	Kea	SWP	Spur-winged Plover	MYN	Myna (Indian)
K-F	Kingfisher (NZ)	TIT	Tomtit	RED	Redpoll
KIW	Kiwi (* specify)	TUI	Tui	ROC	Rock Pigeon (Feral)
LTC	Long-tailed Cuckoo	WEK	Weka	ROS	Rosella (Eastern)
MOR	Morepork	WFT	White-fronted Tern	SKY	Skylark
O-C	Oystercatcher (* specify)	W-H	Whitehead	STA	Starling
PAR	Parakeet (* specify)	W-S	Welcome Swallow	THR	Song Thrush
P-D	Paradise Shelduck	Y-H	Yellowhead	YEL	Yellowhammer

Additional codes used:

Strategic Action Plan						
Goals	**Purpose**	**Action**	**Milestones to date**	**Resources required**	**Outcomes to date**	**Measurement**
Establish governance	Strategic direction				Completed (Trust flow chart)	Governance established
Draft plan	Background and Implementation process	Sub-contract	First drafts underway	Feedback	Completed (draft plan)	Completed (draft plan)
Draft maps	Establish Physical area/s	Request GIS mapping	Rough drafts being edited	DOC GIS	Requested	Completed YES
Create Stakeholder Identification and Engagement Strategy	Establish stakeholder method and processes	Sub-contract		Feedback	Draft	Completed YES/NO
Create Communications Plan	Engage and retain stakeholders	Sub-contract		Feedback	Draft	Completed YES/NO
Create Partnerships/Accreditation Plan	Engage and retain partners	Sub-contract		Feedback	Draft	Completed YES/NO
Identify Risks / draft Risk Management Strategy	Risk aversion (environmental, financial, social, & cultural)	Governance + sub-contract expertise		Governance	Draft	Identified risks minimised/ averted
Begin identifying and listing stakeholders	Human resources /community engagement/risk aversion	Create contact database		Governance/management/ DOC		Underway YES/NO
Draft preliminary trapping plan based on Best Practice	Establish preferred trap locations, types, and numbers required	DOC expertise	Initial plan in development	DOC		Completed YES/NO
Integrate feedback and draft final Plan	Refinement and launch of project	Governance + sub-contract		Governance + management		Completed YES/NO
Begin implementing plans including consultation with key/secondary stakeholders	Initiate key phases	Governance/DOC/sub-contract		Governance/management/ DOC		Completed YES/NO

Create map to stocktake indicator species (birds)	Establish baseline 'bio-indicator' species to measure long term success	DOC expertise		DOC		Completed YES
Undertake baseline stocktake of indicator species (birds)	Establish baseline 'bio-indicator' species to measure long term success	DOC expertise		DOC		Completed YES/NO
Plan management and budget	Tactical and operational	Define roles (KPIs) & budget, apply for funding		Governance/ Fundraiser		Completed YES/NO
Develop monitoring protocols for trapping and biodiversity stocktake	Robust measurement of desired outcomes	Draft protocols; determine best practices		Management/DOC/		Protocols created and followed
Create asset management plan (resource library)	Maintain physical assets & human resources	Stocktake physical assets & human resources		Management		Drafts completed and regularly updated
Create Action Plans/time frames for strategic and tactical projects	Maximise use of resources; minimise resource waste	Create action plans		Management /Governance		Drafts completed and regularly updated
Purchase traps, tracking tunnels	Operational	Source traps/purchase		Funding/DOC/Management		Number purchased
Evaluate integration with concurrent HS restoration projects	Co-ordinate activities to maximise biodiversity outcomes	Management to evaluate with relevant stakeholders		Governance + management		**Improved biodiversity**
Baseline stocktake of additional indicator species (??)	Additional 'bio-indicator' species to measure outcomes	DOC expertise/ sub-contract		DOC /expert contractor		Completed YES/NO
Implement long term Stakeholder, Communications, and Accreditation Plans	Community buy-in + risk aversion Recruit & retain volunteers Recruit & retain local businesses/partners	Refer to Appendices #1, #3, and #5		Funds/IT/ Marcoms skills		Website/social media statistics Number of volunteers recruited/hours worked Number of partners/businesses / dollar value

	Attract interest in testing new PF tech/strategies Become exemplar 'PF' community					Number of other 'PF' organisations working on site (eg experimental traps) Social surveys determine community knowledge and attitudes
Evaluate/adapt trapping plan based on above feedback/reality checks	Minimise risk, maximise biodiversity outcomes			Management/DOC		**Improved biodiversity**
Evaluate and redirect PFHS activities where appropriate to meet goals	Minimise risk, maximise biodiversity outcomes	Governance + management		Governance + management		Completed YES/NO
Trapping and wildlife workshops	Attract volunteers, educate and showcase biodiversity	Organise and run workshops		Manager/DOC/ volunteers		Number of attendees + new volunteers
Create community based monitoring project (ongoing community project)	Engage community and wider stakeholders	Set up iNatutralist		iNaturalist group		iNaturalist project expands continuously
Baseline monitoring 12/24 months	Effectiveness of project	Annual or biannual DOC		DOC or expert		**Improved biodiversity**
Evaluate and redirect priorities where necessary	Minimise risk, maximise biodiversity outcomes	Review plans and outcomes		Governance + management		**Improved biodiversity**

WANTED

The greatest **THREAT** to our **NATIVE ANIMALS** are introduced predators: **rats, ferrets, stoats, weasels, hedgehogs,** & **wild cats.**
Come along to this **FREE**

Trapping Workshop

to learn how **YOU CAN HELP** make

Hanmer Springs Predator Free

CAUGHT

When: 10am-12 midday Sat. 26 Jan. 2019.
Where: Hanmer Springs Sports Pavilion
Jacks Pass Rd., Hanmer Springs
More Info: *afoulkes@doc.govt.nz*

Predator Free Hanmer Springs

Te Tihi o Rauhea
Hanmer Springs Conservation Trust

Department of Conservation
Te Papa Atawhai