Towards a Predator Free New Zealand

PREDATOR FREE 2050 STRATEGY

New Zealand Government

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Towards a Predator Free New Zealand: Predator Free 2050 Strategy
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COVER: Green gecko. *Photo: Sabine Bernert*

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Contents

Photo: Tim Onnes

Minister's foreword

Tēnā koutou katoa

New Zealand is experiencing a biodiversity crisis. Thousands of our native species are declining in numbers, and unless we take bold steps, some will be lost to us forever. The aim of Predator Free New Zealand is a bold step. It has spanned two successive governments, supporting the enormous effort by New Zealanders to free us of introduced predators, ensuring that native plants and animals thrive. In 2018, the Government approved $81.28 million over four years to suppress predators in priority ecosystems, protect and increase biodiversity on offshore islands, and develop more effective and efficient methods to control predators.

Achieving a predator free New Zealand requires all our efforts. Many people are already contributing: individuals, whānau and hapū, land managers and communities, businesses and scientists; local government and national agencies. The Predator Free 2050 Strategy 'Towards a Predator Free New Zealand' wraps a collective framework around this action guiding us toward PF2050, by providing a path towards this shared goal, characterised by local and national collaboration. It is built around three key phases: mobilise – innovate –accelerate.

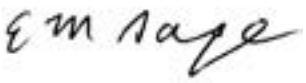
And people are mobilising. Since the Predator Free 2050 goal was announced in 2016 over 5000 groups and iwi have registered to conduct predator control in their communities, supported in their actions by the Predator Free New Zealand Trust. Conservation has increased in scale, with new landscape-scale projects funded by government through Predator Free 2050 Ltd. National collaborations are being formed, focusing on aligning national effort on the key priorities. And local collaborations allow people to contribute funds and time and help.

Meanwhile innovation continues, with DOC's Tools to Market programme funding the development of new tools and technologies to protect and defend sites from reinvasion. These include long-life rat lures and self-resetting traps.

All of this work is shifting us from sustained predator control, currently so critical for the survival of many species, to eradication once and for all. The Government has increased our investment into Tiakina Ngā Manu, DOC's predator control programme, while scientists look for ways to eradicate predators. And where we do have the answers, progress is accelerating, with 117 islands now declared predator free.

Nature underpins our economy, culture and wellbeing. While I acknowledge predator free is ambitious, I believe it is an ambition worth striving for. This Government is proud to be playing a part in this investment in our future and the future of taonga species with whom we share these islands of Aotearoa.

Nāku noa, nā



Eugenie Sage
Minister of Conservation

Long-tailed bat/pekapeka. *Photo: Colin O'Donnell*

1. Our Vision

Whakahokia mai ngā reo karanga o te pēpeke, o te pekapeka, o te ngārara, o te manu ki ngā ngahere, ki ngā whenua pāmu, ki ngā tāone iti, ki ngā tāone nui me ngā takutai.

Return the voices of the insects, bats, reptiles and birds back to the forests, farmland, towns, cities and coasts.

Kākā landing in pōhutukawa tree on Kapiti Island. *Photo: Leon Berard*

2. Introduction

New Zealand is well-known for its ancient species: tuatara, a relic from 200 million years ago; and native frogs, all but unaltered in 70 million years. The physical isolation of Aotearoa has meant that many of our creatures and plants, our 'taonga' of the natural world, are found nowhere else on the planet. That makes our wildlife unique to the landscape of Aotearoa New Zealand.

When people arrived in New Zealand, first Māori, then Europeans and others, they began a process of massive change to the environment. The cumulative effects of fire, land clearance, over-exploitation of resources and introduced plants and animals have left a lasting impact on our native biodiversity. As a result, many species have become extinct, and an increasing number are now threatened with extinction. Our biodiversity continues to face a number of ongoing pressures and our changing climate is exacerbating existing pressures on native species and ecosystems.

Our birds, reptiles, bats and insects could not defend themselves against the mammalian predators that arrived with Māori and European settlers. New Zealand's natural ecosystems were thrown out of balance when people introduced mustelids (stoats, ferrets and weasels), rats, possums and other predatory species into the natural environment. Native wildlife had not evolved to hide, escape or defend themselves from ground-based predation, making them easy prey for the stoats, rats, possums, weasels, ferrets, cats, dogs, hedgehogs, mice and other non-native predators.

Many of our native land species have already been lost. At least 60 birds, three frogs, seven vascular plants and an unguessable host of invertebrates are gone forever. The conservation status of over 9000 native land species assessed reveals that more than 3000 of these are threatened with or at risk of extinction, with thousands more classed as data deficient (meaning we don't know enough about these species to assess their conservation status).[1] Each year over 25 million native birds are killed by non-native predators.[2]

The traditional Māori view of the environment is that we are connected through whakapapa and linked by the threads of a woven universe held firm by an inextricable bond between people and nature. An ecosystem is like a spider web: strong and resilient when all its strands are intact, but when a strand is broken the web is weakened and the integrity of this intricate web is diminished. In te ao Māori, the Māori world view, the mauri (life force), wairua (spirit), mana (integrity) and tapu (sacredness) of the web are all affected in some way.

We've been trying to protect wild populations for decades with traps, bait stations and aerial landscape-scale control, buying our native species breathing space.

Predator Free 2050 is a step change from ongoing control, to coordinated, progressive nationwide eradication.

[1] Data retrieved from New Zealand Threat Classification System, https://nztcs.org.nz/home and MfE Environment Aotearoa 2019 Summary, http://www.mfe.govt.nz/Environment-Aotearoa-2019-Summary.

[2] Hill, G. 2012. Observations: 'Why I enjoyed the Rena disaster'. *Forest and Bird 346:* 49.

2.1 How did we develop this Strategy?

Development of a Strategy to deliver a Predator Free New Zealand by 2050 has been a social exercise, built by engagement across the country with groups and individuals with a range of different interests.

Focus groups involving members of the predator free community (including whānau, hapū and iwi) were used to develop a Predator Free discussion guide for engagement. This was provided for public feedback, and regional hui were held around the country with whānau, hapū and iwi. Feedback was received from a range of different interests and a draft Predator Free 2050 Strategy and 5-year Action Plan were then developed. These were further tested with Treaty partners and national Predator Free collaborators.

Towards a Predator Free New Zealand is a Strategy for all New Zealanders. Together we can make a difference for our native taonga. As a result, collective language (specifically the terms 'we' and 'our') is used throughout this document. A glossary has also been added to provide clarity where needed.

This Strategy develops a programme to drive change. Everything we do adjusts the future, which, in turn, creates uncertainty. This is balanced by the Action Plan which sets out a 5-year roadmap, alongside a longer-term vision, so that all New Zealanders can understand their part in contributing towards a Predator Free New Zealand.

2.2 Predator Free 2050 is a key programme of work towards restoring New Zealand's biodiversity

Predator Free 2050 is not an isolated programme – it is one of many programmes of work that can reverse the decline in our biodiversity if we actively work together. Collectively, these policies and programmes will contribute to the outcomes of the updated New Zealand Biodiversity Strategy (currently in preparation), which is the overarching strategy for a broad range of biodiversity-related policies and programmes. Predator Free 2050 is a significant programme of work that will help achieve Biodiversity Strategy outcomes (fig. 1).

Work towards a Predator Free New Zealand also contributes to New Zealand's wider biosecurity effort to protect biodiversity and other values from biosecurity risks.

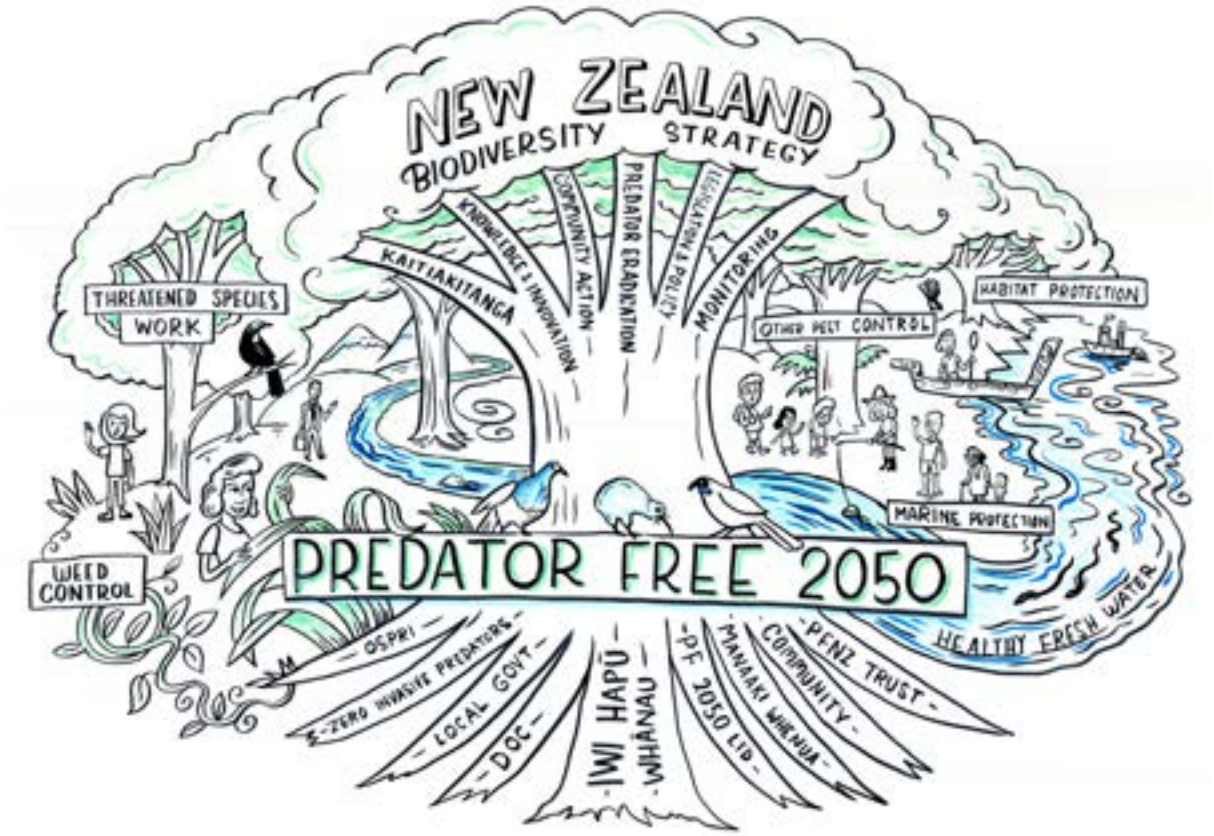


Figure 1: The New Zealand Biodiversity Strategy leads New Zealand's work on biodiversity. All other programmes, including work to make New Zealand Predator Free by 2050, sit beneath this canopy.

2.3 A different approach

New Zealanders can't keep doing what we have always done if we want to change this trajectory of loss. This strategy offers a different approach.

Predator Free 2050 aims to eradicate mustelids (stoats, ferrets and weasels), rats (Norway, ship and kiore), and possums from all of New Zealand by 2050. These species were chosen because, collectively, they inflict the worst damage of all the introduced predators on New Zealand's wildlife. We also know more about their biology and control than any other predators.

With their removal, we can look forward to many species of native wildlife flourishing once again, and to stronger, more resilient ecosystems with mauri restored, bringing balance to Papatūānuku and the taonga of the taiao (environment) that underpins our existence.

Achieving a Predator Free New Zealand signals a turning point in our relationship with nature, and a resolve to leave a lasting legacy for future generations.

New Zealand's Predator Free 2050 Strategy will set New Zealand on a path to achieve this outcome. It is only through our collective efforts that we will be successful.

2.3.1 We are focusing on the three most damaging predators

Stoats (*Mustela erminea*) are found throughout the mainland and on inshore islands within swimming distance of other islands or the mainland. Ferrets (*Mustela furo*) are found in suitable habitats throughout the North and South Islands. They are not found on any other islands. Weasels (*Mustela nivalis*) are also limited to the North and South Islands where they are patchily distributed.

Ship rats (*Rattus rattus*) are among the most widespread mammals on the New Zealand mainland, especially in forests. Norway rats (*Rattus norvegicus*) are the largest of the rat species in New Zealand. They are found in towns, cities and farmland and in isolated populations elsewhere. Kiore (*Rattus exulans*) are the smallest of the three rat species and are considered a taonga by some iwi. Kiore are confined to parts of Fiordland, Southland and south Westland on the mainland and some offshore islands.

Possums (*Trichosurus vulpecula*) are widespread across most of the mainland. They are found on a number of islands including Stewart Island/ Rakiura and main Chatham Island.

Mustelids

Stoats (*Mustela erminea*)

Photo: Tim Sjoberg (DOC)

Ferrets (*Mustela furo*)

Photo: Michelle Bridge (DOC)

Weasels (*Mustela nivalis*)

Photo: DOC

Rats

Ship rats (*Rattus rattus*)

Photo: DOC

Norway rats (*Rattus norvegicus*)

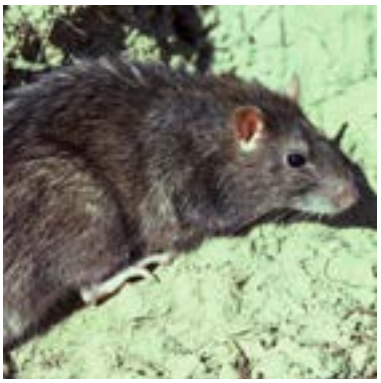


Photo: Rod Morris

Kiore (*Rattus exulans*)

Photo: DOC

Possums

Possums *(Trichosurus vulpecula)*

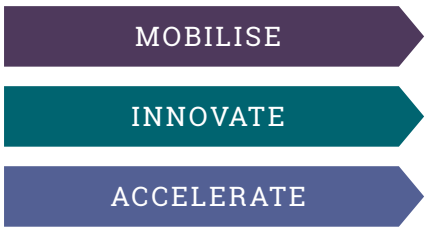
Photo: Alan Cressler

Trap check in Puhikoko Reserve. *Photo: Omataroa Kiwi Project*

3. Our Strategy for a Predator Free 2050

The Strategy comprises three actions that describe how New Zealand will achieve the Predator Free 2050 goal to eradicate mustelids, rats and possums by 2050 – **mobilise**, **innovate** and **accelerate** – delivered through six pathways:

- Whānau, hapū and iwi expressing kaitiakitanga
- Communities taking action
- Supporting the kaupapa through legislation and policy
- Advancing our knowledge, innovation and improvement
- Measuring and assessing the difference we make
- Moving from sustained predator control to eradication.



A companion Predator Free 2050 5-year Action Plan focuses on the work required over the next 5 years, outlining key outcomes within the six pathways.

In summary, New Zealand's Predator Free 2050 Strategy is to mobilise, innovate and accelerate delivery of a predator free New Zealand by 2050.

Mobilise: Taking the steps needed to build predator free communities and establish regional and national collaborations.

Innovate: Developing the new and transformational tools and techniques (and the public acceptance of them) that will be required to eradicate predators.

Accelerate: Applying Predator Free 2050 tools and techniques across the landscape as fast as possible, as they are developed.

The three actions are displayed at the top of pages later in this Strategy. They are interlinked, but for each pathway, one will have more emphasis than the others, which is shown visually.

3.1 The opportunity

The good news is that, where we undertake sustained predator control or eradicate predators, wildlife returns. This means that by 2050, New Zealand could see native bird and other wildlife such as bat, lizard and insect numbers, at similar levels to a century ago.

Predator Free 2050 has already been a catalyst for action. It harnesses the momentum of hundreds of community conservation projects around the country. It dovetails with existing conservation strategies, and offers central and local government, iwi/Māori, science and environmental agencies, NGOs, businesses and communities the unifying vision of an endgame, driving alignment of effort.

Specialist organisations have been created to drive the mission forward:

- the Predator Free New Zealand Trust to support community action
- Predator Free 2050 Limited to arrange co-funding and coordinated support for large landscape-scale projects (mainly outside of the public conservation lands managed by DOC) and breakthrough science
- Zero Invasive Predators to design and deliver tools that can remove and protect at scale.

These specialists will work with established organisations and government agencies to progress the mahi.

Predator free projects in Waiheke, Taranaki, Hawke's Bay, Wellington, Dunedin and Rakiura are underway. DOC's national coordinated landscape-scale predator control programme 'Tiakina Ngā Manu' has increased DOC's annual predator control effort from an average of approximately 200,000 hectares to 1 million hectares. Alongside these larger scale projects are over 1200 projects led by whānau, hapū, iwi and communities to undertake predator control.

For whānau, hapū and iwi, the long relationship with the land and the ethos of care this has crafted adds drive and meaning to that national aspiration, because so much of Māori tikanga, or customary values, is defined and nourished by the land itself. That culture of care and responsibility around an ethos of guardianship that nurtures the welfare of the land, and by natural extension, the people, is expressed through the concept of kaitiakitanga.

Predator Free 2050 builds on existing knowledge, borrowing the best from existing predator control and eradication projects while exploring solutions to address limitations. We need to learn how to apply and modify our approaches in cities, towns and farmlands where people and nature coexist. By setting targets at and beyond our current capability, Predator Free 2050 is stimulating new ways of thinking and doing. DOC and Predator Free 2050 Ltd administer funds to develop new tools and techniques. Predator Free-related research is developing the tools, methodologies and understanding to deliver a predator free New Zealand.

Predator Free 2050 will take time and will build on the work, the knowledge, and the gains, as success occurs. The biodiversity of Aotearoa is the common heritage of all New Zealanders. That means we all have a part to play in seeing the mauri regained within taonga species. Anyone and everyone, can be a part of Predator Free 2050.

3.2 What success looks like (outcomes)

Removing predators enhances our native wildlife, strengthens the resilience of ecosystems and provides broader outcomes for New Zealanders – for primary production, and for health and wellbeing. Killing predators for the sake of it is not why New Zealand is becoming predator free.

Outcomes will be established under the New Zealand Biodiversity Strategy. In the interim, we have developed a set of working outcomes that achieving a Predator Free New Zealand will contribute towards.

New Zealand stands to gain by achieving a predator free state (fig 2).

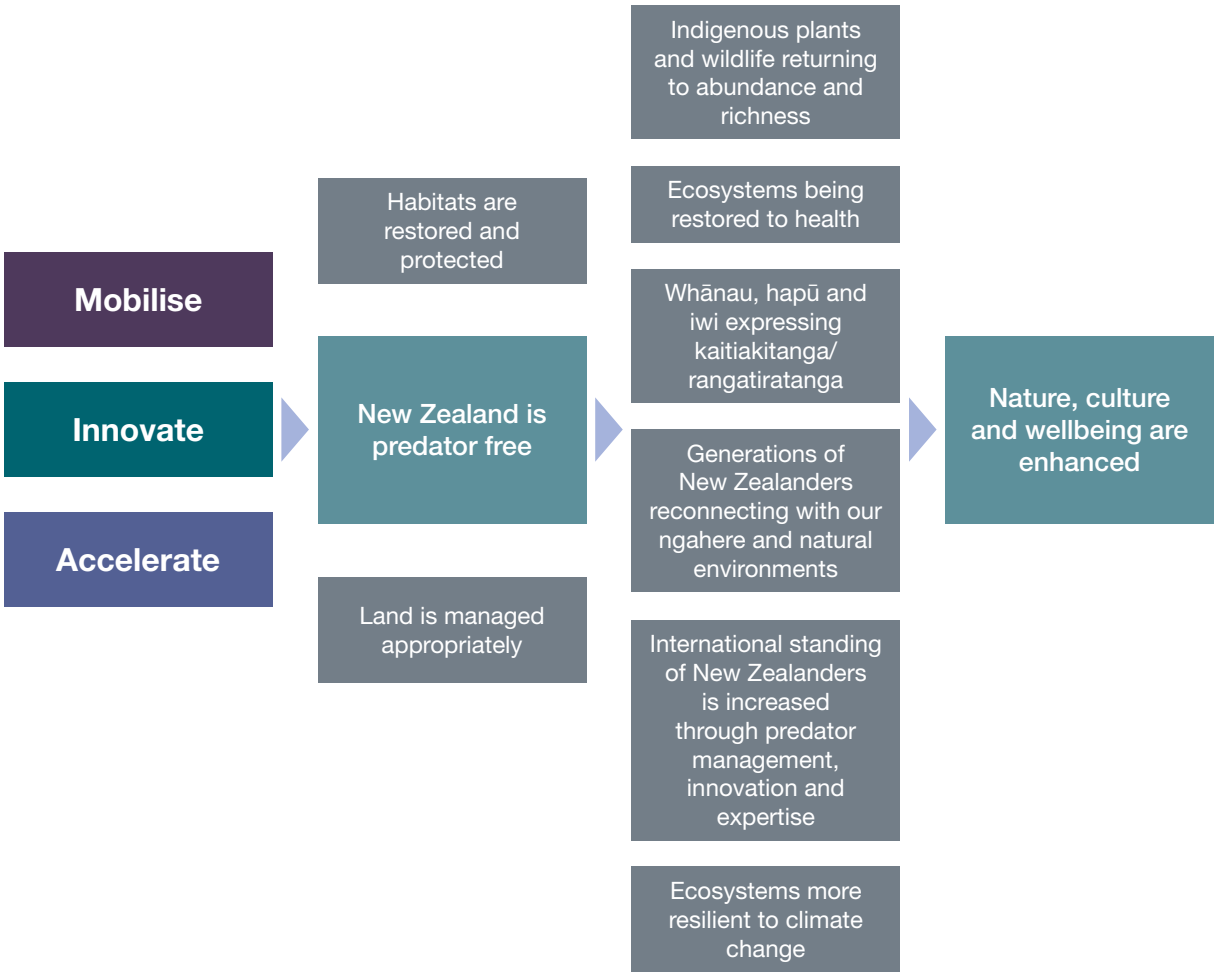


Figure 2: Working outcomes that show what we will gain by becoming predator free.

3.3 Key shifts we need to make to deliver Predator Free 2050

The idea of a predator free New Zealand captured the imagination of the late Sir Paul Callaghan, who raised it in the public and political consciousness as 'New Zealand's moonshot'.

Predator Free 2050 will be a world first – there is no manual to follow. It builds on sturdy foundations: the expertise gained from decades of successful island predator eradications, and a trove of evolving knowledge, including mātauranga derived from generations of interaction between people and te taiao.

The stretch it will take to achieve Predator Free 2050 suggests New Zealanders need to shift the way we think, behave and do.

3.3.1 Treaty partnership

Predator Free 2050 offers New Zealand more than a vision of abundant nature. It presents an opportunity to strengthen the partnership between Māori and government. The Treaty of Waitangi defines and guides the relationship with whānau, hapū and iwi, and work to achieve a Predator Free New Zealand gives us the chance to express it as a shared will to rescue shared taonga. Māori values, practices and stories are integral to the Predator Free kaupapa, and Māori knowledge and energy is crucial to the success of an ambition with no global precedent.

The culture of care created by the people's long relationship with the land is defined and nourished by the land itself. Wairuatanga recognises that inseparable bond and a reality that transcends culture – that if the environment is ailing, we are all weakened.

Whānau, hapū and iwi regard broad-scale predator control as one way of restoring mauri, or life force, returning both land and culture to good health. When Māori exercise their rangatiratanga – their authority and sovereignty – Predator Free 2050 gains the potent force that is kaitiakitanga, the custodianship that nurtures the welfare of the land, and by natural extension, the people.

The Treaty partnership shift recognises the key role that whānau, hapū and iwi play in the movement towards a Predator Free New Zealand, designing, deciding and delivering predator management projects and playing a central role in broader regional collaborations.

3.3.2 Collective impact

Collaboration is key – no single entity can meet this ambitious goal alone. Achieving Predator Free 2050 will rely on 'collective impact', a concerted effort across organisations and other groups that have national impact, which together will accomplish much more than operating on their own. Working together for collective impact means our efforts can go further, faster.

Collaborating on the various Predator Free 2050 strands will ensure that government agencies, iwi/Māori, local government, science providers, educators, innovators, businesses and NGOs are better able to meet the goals before them. Collective impact is an inclusive approach that welcomes a diversity of views, values and talents, producing a collaboration working to an agenda shared by everyone.

National collaboration enables alignment of work amongst the various national Predator Free collaborators and will drive investment of money, resources, research and ideas.

This addresses current weaknesses in coordination and collaboration across the national organisations involved in Predator Free 2050. It is critical to delivering Predator Free's ambitious needs for knowledge, data collection and evaluation, communication and delivery of Predator Free 2050 on the ground.

The collective impact shift sets in train six national collaborations to develop shared agendas and guide collaborative planning, action and review.

3.3.3 Local ownership of solutions

This shift recognises that local people need to have a say about their places. Regional collaborations will happen locally – whānau, hapū and iwi, communities and landowners, alongside DOC and local government making decisions about the places where they live, work and play. Strong community leadership and collaboration is essential to enable the local ownership and commitment vital to sustain the long-term vision and pathway towards Predator Free 2050.

With this approach, national organisations need to shift from supplying solutions for local communities to a supporting and facilitating role, with the local solutions emerging from the people at that place.

Collaboration is not new. There are some great examples of regional collaboration among natural resource managers that are setting the benchmark. The aim of this strategy is to build on this existing work and ensure we can deliver collaboration to explicitly achieve predator eradication.

3.3.4 A learning-based approach

Predator Free 2050 is a world first – there is no map. This Strategy helps that journey but New Zealanders will need to learn as we go, adjusting our thinking and behaviour in light of new learning, new knowledge and new ideas. In some cases, this will be iterative as existing tools and methods improve over time. In others, new technologies and new discoveries may cause us to change paths in ways that we can't, as yet, anticipate.

New Zealanders are 'learning by doing' in initial large landscape projects in Taranaki, Hawke's Bay, Wellington, Waiheke, Dunedin, Abel Tasman, Mackenzie Basin/Te Manahuna Aoraki and Rakiura.

As we learn, we need to be prepared to change course as we go, informed by better understanding of predators, of ecology and of people. And learning from projects needs to be shared so the wider Predator Free 2050 community can benefit.

This reflects the uncharted waters faced by Predator Free 2050. It assumes we don't have all the answers and need the opportunity to 'fast fail', to be agile and adapt.

3.3.5 People's behaviour supporting thriving wildlife

Ultimately, the success of Predator Free 2050 (PF2050) depends on a significant number of people behaving differently and doing new and different things. Although people may tacitly support the ideas behind PF2050, it is actions that will make the difference. The programme will have to understand what motivates people to actively engage with PF2050, whether it be backyard trapping, planting or habitat restoration.

There is a vast literature that cites other countries' experiences about what shifts people from passive support into action, albeit in other contexts. PF2050 will learn from this and develop our own understanding of motivations in this new and unique context of predator eradication and suppression.

To do this, the partners in PF2050 will move beyond the one-size-fits-all knowledge deficit model of 'think-care-act' for behaviour change, into a more nuanced and accurate insights-based understanding of the beliefs, values and motivations of multiple segments of the population. The knowledge deficit model assumes that understanding and caring about something leads to action and we know now that this is ineffective.

People may be driven to engage in an action that has conservation benefits for a range of reasons other than biodiversity outcomes, eg economic, health or community connection. These are usually termed 'co-benefits' and we will learn to understand and build on these.

The 30-year time frame of PF2050 means that we need to invest in understanding how to scaffold children's empathy and compassion for the environment while introducing the idea of predator control at the right age so that as they grow, the schoolkids of today become active contributors tomorrow.

Society and its norms will evolve over the time frame and as these shift, PF2050 will track these societal shifts and evolve accordingly, so the programme remains aligned with the society it serves.

This shift acknowledges that people and their behaviour are at the heart of PF2050, and as already said – we need to shift the way we think, behave and act. We will do this based on solid evidence and new and innovative methods from the social and behavioural sciences.

3.3.6 Eradication

In New Zealand, we've been controlling predators for decades using traps, bait stations and aerial landscape-scale control, enabling effective control over limited areas – a way of buying our native species breathing space. Pest-free islands and fenced mainland sanctuaries illustrate that more is possible. This is the fundamental transformative shift – from predator control to eradication.

We understand many of the fundamentals but we haven't got all the answers. PF2050 builds on the knowledge gained from decades of successful island predator eradications in New Zealand. We have shown we can do this on islands and sections of the mainland. Now we need to figure out how to build on that knowledge and learn how to apply and modify our approaches in cities, towns and on farmlands where people and nature coexist and/or where there are no barriers to reinvasion by predators.

Without the use of fences, eradication (the complete removal of predators), is a much more difficult goal than sustained control. It requires a much higher level of planning, resourcing and long-term support from contributors than our normal predator control work. It is dependent on the success of current research, such as that undertaken by Zero Invasive Predators (ZIP) which is promising but still has a long way to go. There is also a need to resolve new issues associated with eradication on the mainland, such as managing reinvasion by predators and thinking through the ecological effects of removing some predators from the broader community of pests at the site.

This shift takes us from ongoing pest control, continually trying to 'hold the line', to coordinated and connected landscape-scale eradication, leaving New Zealand free of these predators once and for all (table 1).

Table 1. Shifts required to deliver Predator Free 2050.

Key shifts required to deliver Predator Free 2050	
Variable Treaty partnership	Flourishing Treaty partnership
Separate action	Collective impact
Top-down decision-making	Local ownership of solutions
Performance-driven approach	Learning-based approach
People being told to care	People's behaviour supporting thriving native wildlife
Ongoing pest control	Eradication of predators

3.4 Goals for 2025

Four interim goals were established in 2016, to be delivered by 2025. They were designed to focus technical effort and demonstrate progress towards the main PF2050 goal.

The interim goals did not capture all the actions required to achieve Predator Free 2050. Critical to the success of the programme is progress in areas where people and nature coexist as well as continuing to build understanding, capability and capacity, coordination and collaboration.

This Strategy builds on the existing interim goals to establish a fuller set of 2025 goals, which sit alongside broader actions in the Action Plan that support furthering understanding, resourcing and collaboration.

3.4.1 Interim 2025 goals

- By 2025, we will increase by 1 million hectares (from 2016 figures) the area of New Zealand mainland where predators are suppressed, through Predator Free 2050 projects.
- By 2025, we will have demonstrated that predator eradication can be achieved in areas of mainland New Zealand of at least 20,000 hectares and that these areas can be defended from reinvasion without the use of fences.
- By 2025, we will have eradicated all mammalian predators from New Zealand's uninhabited offshore islands.
- By 2025, we will have developed a breakthrough science solution that would be capable of eradicating at least one small mammal predator from the New Zealand mainland.
- By 2025, whānau, hapū and iwi will have identified sites of importance for predator eradication and at least five eradication projects led by whānau, hapū and iwi will be underway across the country.
- By 2025 we will have eradicated possums or mustelids from at least one New Zealand city.
- By 2025, effective tools and knowledge will be available to achieve predator eradication on farmland.

Antipodes Island parakeet. *Photo: Finlay Cox*

4. Developing a system for change

Achieving a Predator Free New Zealand depends on New Zealanders getting behind the kaupapa, learning and adapting as we go. Our thinking also needs to be innovative and inclusive.

National and regional collaborative groups will lead the direction of PF2050. Membership of these groups will ensure that decisions are made by those close to the action, and by those who have the ability to influence the system through resourcing and effort.

This approach enables local ownership, whānau, hapū and iwi and community organisations, alongside DOC and local government, to come together to articulate how they will collaborate and align their work to become predator free. Regional collaborative groups will also deliver stocktakes of work within each region and develop 5-year action plans that articulate how regions will work towards PF2050.

The intent is to establish collaborative groups to coordinate and set direction for implementing the six pathways. The outcomes and learning of the 'Advancing our knowledge, innovation and improvement' collaboration pilot will be evaluated to guide the roll-out of other collaborative groups.

One senior representative from each relevant organisation will have the capability to make decisions and enable input to and from collaboration group meetings. The process will clarify roles and responsibilities for each agency in delivering the work plan. Ultimately, this approach will build trust and 'power-up' the system, enabling a system response to a complex issue.

The groups will take responsibility for setting the direction for their strategic pathway. This creates the ability to keep the strategy live and to respond to change based on new knowledge.

National collaborations will involve members of the Predator Free community whose work has a national impact and where there is a need to align resourcing and effort. National collaborations will be set up for each of six pathways. The first of these groups *Advancing our knowledge, innovation and improvement* is being piloted.

Each national collaboration will nominate a lead, who will form part of the steering group. The balance of the steering group will be made up of representatives of any of the national organisations involved in PF2050 who are not represented by the collaborative group leads. This steering group will be tasked with working across the pathways to identify synergies, opportunities and relative priorities and to track and report on progress. This ensures the Predator Free 2050 programme remains cohesive and operates as more than the sum of its parts.

The collaborative and steering groups are mechanisms to organise and coordinate the national-level work; they do not provide programme governance. The organisations involved in each collaborative effort have their own independent governance with current programme governance provided by Cabinet. There have been calls to provide a governance model that reflects the inclusive and collaborative intent of the Strategy. This will be investigated in the near future.

Figure 3 depicts how this system will look.

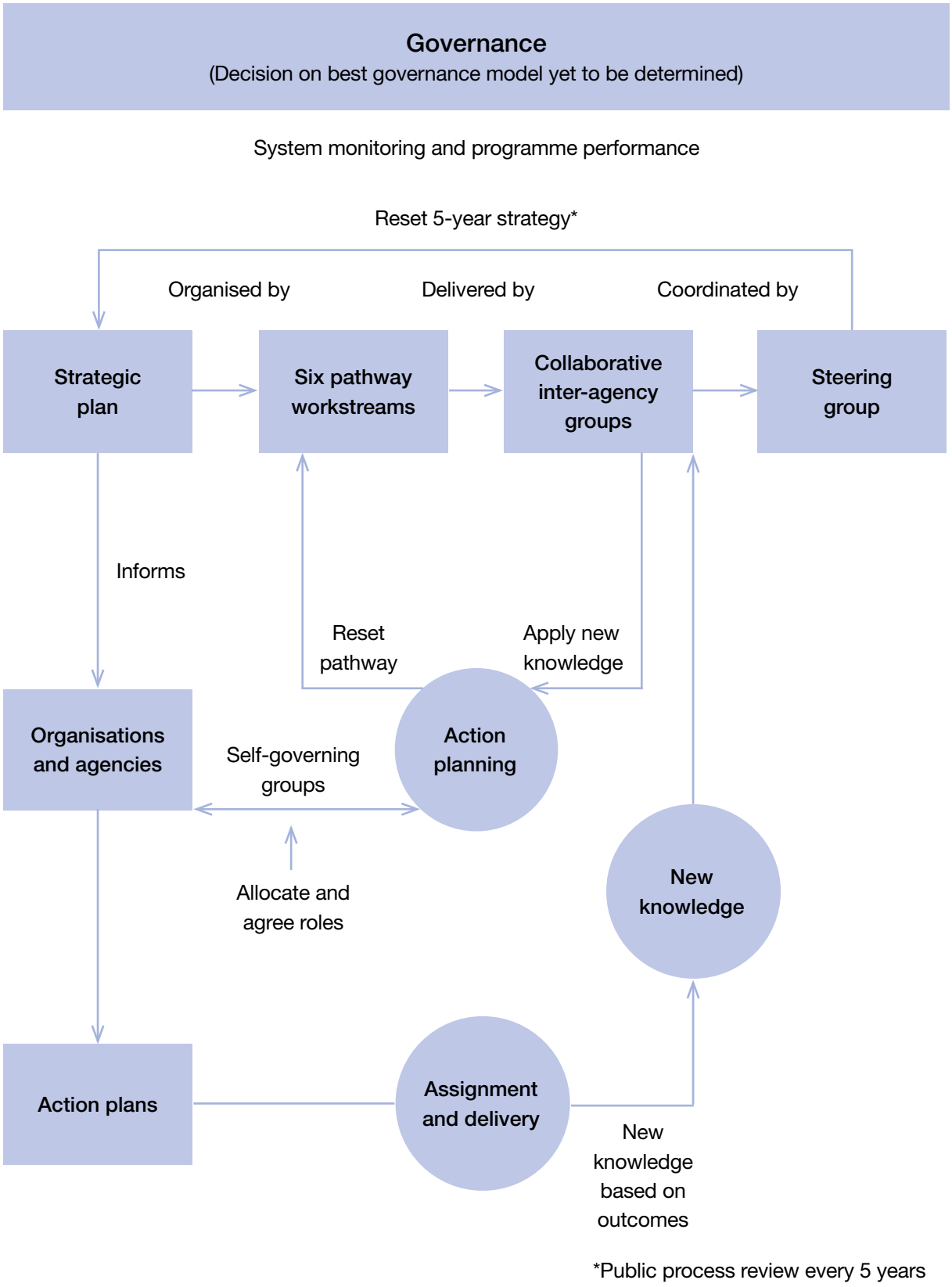


Figure 3: Predator Free system.

4.1 Guiding principles

How New Zealand works towards becoming predator free is as important as achieving the outcome. Our principles guide the way we do the work.

Principles	How we express them in our work
Collaboration	The scale and complexity of the task means isolated actions will not achieve our goal. On this journey we need everyone to work together, combining efforts to get the job done.
Connection	Predator Free 2050 isn't about killing predators for the sake of it. A Predator Free New Zealand will result in flourishing biodiversity and improved wellbeing for New Zealanders. Retaining a connection to these broader outcomes is critical for this work.
Environment at particular places	Local action, led by communities who look after the environment at particular places, is supported by national planning and actions.
Inclusivity	The biodiversity of Aotearoa is a taonga, the heritage of all New Zealanders – including those yet to be born. That means we all have a stake in seeing it thrive again. Anyone and everyone can be a part of creating Predator Free 2050.
Guardianship and responsibility	Whānau, hapū and iwi have an obligation of kaitiakitanga, deriving from whakapapa, to care for indigenous plants and wildlife. Although only Māori can be kaitiaki, an ethic of 'wise stewardship' or guardianship also weaves through Western and other thinking. We need to embrace these dual responsibilities, to care for what makes New Zealand unique, as we work towards Predator Free 2050.
Adaptability	Predator Free 2050 is taking us into new territory. We don't have all the answers. A culture of learning and adapting as we learn is critical to the programme's success.
Courage	Becoming Predator Free by 2050 requires us to have the courage to do things differently and the courage to change and adapt in the light of new information and knowledge.

Collecting kawakawa leaves for rongoā. Photo: Tessa Ralston

5. Pathways towards a Predator Free New Zealand

Six pathways have been identified to deliver the strategy and drive the shifts in the way we do things. The pathways are a way of organising like skills and action – bringing coherence to work programmes and making sense of a complex response.

- Whānau, hapū and iwi expressing kaitiakitanga
- Communities taking action
- Supporting the kaupapa through legislation and policy
- Advancing our knowledge, innovation and improvement
- Measuring and assessing the difference we make
- Moving from sustained predator control to eradication

The principles expressing how we will work together bind the pathways into one cohesive programme as expressed in the Predator Free 2050 whāriki – the base on which all our Predator Free 2050 actions sit (fig 4).

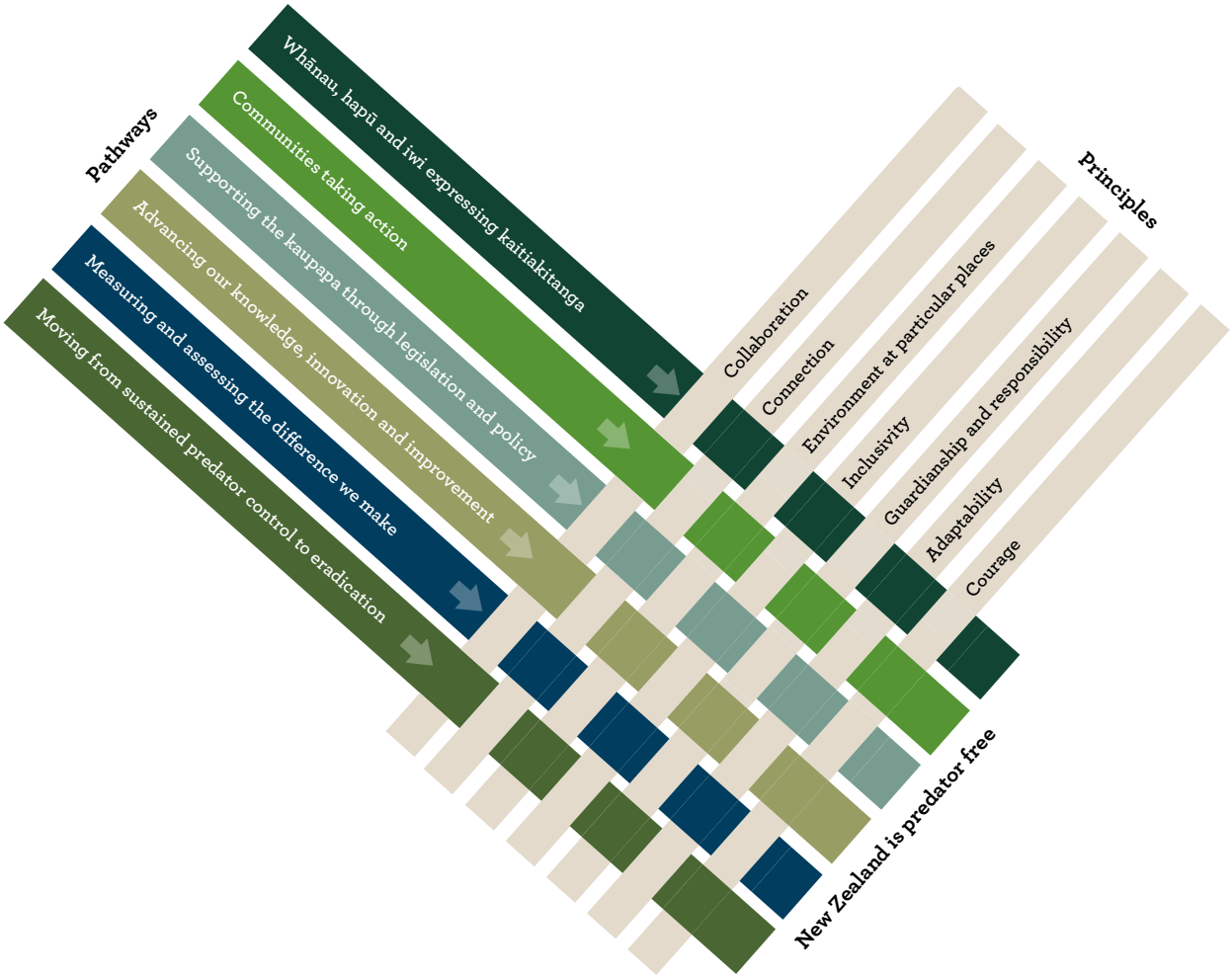


Figure 4: Predator Free 2050 whāriki.

5.1 Whānau, hapū and iwi expressing kaitiakitanga

This pathway expressly recognises the kaitiaki role of whānau, hapū and iwi.

Our history, institutions and systems and a loss of connection to whenua and cultural practice have created many barriers for whānau, hapū and iwi. The Predator Free 2050 kaupapa provides an opportunity to help rekindle that connection.

For whānau, hapū and iwi, this means drawing on the knowledge of kaumātua and tāhuhu kōrero (history) to understand how places have changed over time, using connections and relationships to share and learn. Many Predator Free 2050 projects are and will be designed, led and delivered by whānau, hapū and iwi at their places. As the whenua thrives, so too will the people thrive.

For agencies this means taking a supporting role by:

- developing relationships and trust
- coming to the table ready to listen
- understanding the needs of whānau, hapū and iwi from the whānau, hapū and iwi themselves, and
- seeking to address them.

These needs are likely to include education and employment, for young people to have employment at home and elsewhere, and to have the education they need to achieve this.

Whānau, hapū and iwi will increasingly play a central role in education and employment, working alongside agencies, community groups and others to develop and plan a path forward.

Education and employment are strands in this pathway.

5.2 Communities taking action

Individuals, hapū, families and communities have been quick to embrace the concept of a predator free New Zealand and more and more New Zealanders are participating in predator control and eradication programmes. One task of Predator Free 2050 is to maintain and strengthen the national passion it will take to achieve it.

This passion needs to be sustained in the long term because it will take a generation to achieve the goal, and today's schoolchildren will be tomorrow's leaders. We need a focus on environmental education for our children, growing understanding of what predators are doing to our environment and how they can help.

Because our society is changing – we're aging, becoming more urbanised and more culturally diverse – Predator Free 2050 will need to be socially flexible enough to accommodate these shifts. Generally, New Zealanders agree with the need to become predator free, but some question how it should be done – or whether it can be done at all.

The organisations with key roles in achieving a predator free New Zealand will need to consider how best to support community groups and individuals: what their needs are, how to address these, and how to be accountable to their communities. By learning how to address the different perspectives and values held by New Zealanders, and how to involve them in the decision-making that affects them, participation will increase across all New Zealand cultures.

Investment and funding could be stimulated by continually demonstrating the economic value of Predator Free 2050 to sectors such as tourism and primary production. It will also be stimulated by local communities demonstrating the benefits that come as more and more sites are cleared of introduced predators and biodiversity begins to recover.

Predator Free will allow more New Zealanders to experience what healthy forests and other ecosystems look and sound like. This, in turn, will foster wellbeing and inspire more and more people to get behind further projects and secure the gains we have made.

The stories we tell, as well as who tells them, have a key role in sustaining the passion needed to achieve the Predator Free goal.

5.3 Supporting the kaupapa through legislation and policy

This is a targeted pathway to consider whether New Zealand has the legislative tools and policy frameworks to support Predator Free 2050. Tools under the Biosecurity Act 1993, the Conservation Act 1987, the Resource Management Act 1991, the Reserves Act 1977, the Hazardous Substances and New Organisms Act 1996 and Animal Welfare Act 1999 also need to be assessed to understand the best way to use them to support this kaupapa.

Environmental scanning underpins this theme, identifying and addressing issues and opportunities in the policy and regulatory environment, as they arise.

There are some near-term opportunities – a new New Zealand Biodiversity Strategy is being developed, and with it comes the opportunity to reinforce Predator Free 2050's role in delivering wider biodiversity and wellbeing outcomes. At the regional scale, Regional Pest Management Plans can perform a similar role. Local authority long-term plans set out how they will invest over the next 10 years and alignment between these and regional planning is critical.

The Biosecurity Act 1993 is being reviewed, which provides the opportunity to consider whether the 'biosecurity toolbox' works for Predator Free 2050. In the interim, the national collaboration will investigate steps New Zealand could be taking now to use this Act to support Predator Free 2050 outcomes, such as pest management plans, unwanted organism classifications and border control.

The review of the Resource Management Act 1991 and development of National Policy Statements under this Act are also worth considering in the Predator Free context, particularly where they relate to or impact on the habitats of our indigenous species.

There will also be a need for different regulatory solutions at particular places as we achieve eradication, to protect borders and prevent reinvasion.

The Hazardous Substances and New Organisms Act 1996 didn't anticipate some of the novel methods (eg field trials of para-aminopropiophenone (PAPP)) that may be required to make New Zealand Predator Free.

The national-level collaborative group needs to consider the regulatory environment we operate in and whether efficiencies can be made while giving New Zealanders the confidence that operators are qualified, and methods are safe and humane.

5.4 Advancing our knowledge, innovation and improvement

This pathway is fundamentally about developing the knowledge New Zealand needs to get us to our Predator Free goal. It is about identifying and using existing knowledge, as well as gaining new knowledge and refining, adapting and developing the tools and methodologies we need. If we don't solve how to eradicate predators and successfully defend sites, then we have failed.

The knowledge New Zealand needs is not limited to predator biology and ecology – we also need to understand people. Social science can help us in understanding the range of public perceptions and understandings around predator control and the protection of our unique plants and wildlife.

Mātauranga (traditional knowledge) has equal weighting here. Mātauranga articulates centuries of Māori understanding: the knowledge, history, customary practices and spiritualities of a people intimate with nature. As part of the Predator Free 2050 kaupapa, mātauranga will be practised at the local level and will inform the national level. Mātauranga will inform the shared science agenda.

Much work is already underway. DOC and Predator Free 2050 Ltd administer funds to develop new tools and techniques and many research programmes are already up and running. Technological capability is increasing all the time. In some cases, we're already close to success – for instance, potential methods to eradicate possums by refining and adapting existing technology is being trialled in four locations on the mainland.

However, there are still a number of gaps. In particular, we need more emphasis on 'applied' science – research into the practical use of new technologies. National research investment needs a greater focus on delivering a Predator Free New Zealand. That research needs to be carefully prioritised to get the best possible results from the funding available.

And we need more of an understanding and insight into the values, beliefs and motivations of New Zealanders in order to help develop active engagement in PF2050. We know that we need to move beyond assuming that understanding leads to caring and consequent action and build models based on a much more nuanced understanding of what shapes behaviour.

For example, it is likely that some pro-PF2050 behaviours are not necessarily driven by caring for nature, but for other reasons related to economics or health or social and community connection. We will need to understand the full range of reasons why people engage as well as understand the many differences that will exist between different parts of the population.

Ecosystems are complex and unpredictable things. We need to better understand, for example, what might happen once all rats, stoats and possums are eradicated. We should do all we can to understand all the risks and trade-offs of eradication.

Broader biodiversity research also needs to happen. Our biodiversity needs more than just freedom from predators, there must be ample food and quality habitat to accommodate the increase in population numbers.

A twin-hulled waka is an effective analogy for how mātauranga Māori and Western science could come together. It is not about one engulfing the other – both are equally needed. Since mātauranga Māori is local (particular to the rohe), every whānau, hapū and iwi will have a different view or understanding of what it is and what is important.

5.5 Measuring, assessing and evaluating the difference we make

New Zealand needs to have a clear understanding of what data we need and why, so that our data collection focuses on the right things. Data will inform the decisions we make. It needs to be accessible and visible so that the people who need it can access it and make sense of it. And it needs to be reported, giving people visibility of how well we are doing.

Data collection, analysis and dissemination is a fast-paced field, with information technology evolving and changing rapidly. A challenge for this pathway is harnessing these developments and bringing them online quickly to benefit Predator Free 2050. We need to use the best tools we can get.

A key first step is cementing national collaboration, ensuring data is managed collectively among the multiple organisations. Early steps are being taken to investigate a tool that has already been developed which has potential here, known as a data portal. Geospatial tools are also important as we plan for Predator Free 2050. The Predator Free New Zealand Trust is developing a map illustrating current community predator control projects. This includes projects by community groups, landowners, DOC, Predator Free 2050 Ltd, local authorities and OSPRI.

Monitoring is crucial to detect the presence of predators and to understand the difference we are making. As part of this kaupapa, there will be opportunities for mātauranga-centred monitoring at particular places or rohe.

5.6 Moving from sustained predator control to eradication

This pathway is the sharp end of the Predator Free 2050 programme, addressing the actions required to progressively eradicate mustelids, rats and possums from landscape-scale sites, preventing their reinvasion and replacing them with thriving populations of native wildlife.

New Zealand's biodiversity continues to decline, indicating that 'business-as-usual' predator control is not sufficient. This is the pathway where we need to manage predator control more intensively across a much wider scale if we are to stop the decline. It's where we shift from control to eradication.

This pathway seeks effective coordination of effort at the national level through collaborative planning by the delivery agencies: DOC, regional councils, OSPRI and others. The collaborative impact of this approach will enable agencies to work to their strengths in delivering integrated predator management across land tenures, ultimately leading to eradication. At the local level, regional collaborative groups comprising hapū/iwi, local government, DOC, community groups and others will scope and develop regional plans for their places, learning from existing eradication projects.

The pathway includes sustained landscape-scale predator control which is crucial while we shift our sights to eradication.

Investment in knowledge and innovation pay off here – as new technology comes on stream, research and knowledge improves predator management and the most humane and cost-effective ways to shift from sustained predator control to eradicating predators are developed. Modelling to determine the optimal predator eradication for different environments will support regional planning.

Islands, often refuges of some of our most threatened species, get their own focus with the establishment of a dedicated island eradication programme.

Southern rātā, Enderby Island. *Photo: Jo Hiscock (DOC)*

6. Who's involved?

6.1 Roles and responsibilities

Whānau, hapū and iwi have a whakapapa relationship with New Zealand's indigenous flora and fauna. As kaitiaki they have an obligation to ensure that our native taonga are protected for future generations. Tangata whenua will play a key role in reaching the goal of a predator free New Zealand.

Communities (including businesses and NGOs) will play a critical part in New Zealand becoming predator free, as to be successful we need support and commitment from throughout the country and across communities. Increasingly, people around New Zealand are coming together to form local predator trapping programmes, independent of central or local government commitment.

Landowners and land managers play a vital role in Predator Free, both as beneficiaries of reduced economic impact on agriculture and as active contributors on their own land. Farmland also has the potential to provide barriers to predator movement.

New Zealand's Biological Heritage National Science Challenge is focused on coordinating the science system for effective delivery of one of New Zealand's priority science challenges. Some of the work being done for this challenge will assist in the development of new predator control tools and surveillance technologies, learning more about the population ecology of the target species, as well as effective data management and monitoring. BHNSC is also investing in social science research which will help shape how we work towards a Predator Free New Zealand as a collective.

Department of Conservation (DOC) is the government agency responsible for facilitating the overall Predator Free 2050 programme and ensuring public and private sectors are connected. It is responsible for developing the strategic direction. As well as this, DOC delivers a large component of Predator Free 2050, including predator management, eradication science, training, regulatory work and partnership development. It is also a key contributor to regional and local predator control activities and planning.

The Predator Free NZ Trust is an independent organisation established in 2013. Its vision is to connect and energise the nation towards Predator Free 2050. It aims to do this through inspiring, engaging with and supporting community groups and individuals, helping to make involvement in predator control easy and accessible to all New Zealanders, and as effective and efficient as possible.

Predator Free 2050 Limited is responsible for directing a significant amount of Crown investment into the Predator Free 2050 programme. The company is focused on investing in large, high value, landscape-scale predator removal initiatives and breakthrough science.

Local Government (regional and district councils and unitary authorities) are instrumental in delivering Predator Free 2050 programmes at the community level. Regional councils are the key organisations responsible for delivering pest management on land outside conservation land administered by DOC. They manage public parks and reserves and undertake large-scale predator control. They are actively working with private landowners, community groups and iwi/Māori in planning and undertaking predator control activities. Many district and city councils around the country are leading the work with their citizens in the effort to become Predator Free.

Manaaki whenua – Landcare Research is a Crown-owned research institute (CRI) which specialises in terrestrial (land-based) research. This includes native forests and the plants and animals, including pests – especially mustelids, rats and possums – that live within them. Manaaki whenua is responsible for much of the modelling that has been done with regard to possum numbers and their impact in New Zealand.

Ministry for the Environment (MfE) is the government agency responsible for overseeing the resource management system (including the Resource Management Act 1991) and for making decisions that protect and improve our natural resources. In particular MfE oversees the Pest Control Regulations under the RMA.

Ministry for Primary Industries – Biosecurity NZ promotes alignment of pest management within the whole biosecurity system, overseeing New Zealand's systems for pest management and measuring overall system performance, facilitating the development and alignment of national regulations, promoting public support for pest management and facilitating communication, cooperation, and coordination among those involved in pest management. In addition, MPI leads and facilitates the management of animal welfare policy and practice in New Zealand, and also provides regulatory control of vertebrate toxic agents. Once predators are eradicated, MPI will have a crucial role in ensuring they are not reintroduced to New Zealand via the international pathway.

Environmental Protection Agency regulates hazardous substances and new organisms including novel predator control technologies and methods.

Zero Invasive Predators Ltd (ZIP) develops operationally ready, innovative, strongly supported technologies to completely remove stoats, rats and possums from large mainland areas, and then defend those areas from reinvasion.

OSPRI runs the national programme that aims to eradicate Bovine Tb (Bovine tuberculosis) from New Zealand by 2055. The largest vector of Bovine Tb is possums (and, to a lesser extent, ferrets). OSPRI operates a large possum control programme across the country, keeping possum numbers low enough to eradicate Tb from local cattle populations.

New Zealand Fur Council represents the interests of the members of over 90% of the fur industry. This group is made of possum fur harvesters, fibre collection agencies, yarn spinners and knitters. With large numbers of very experienced trappers on the ground, they can play a role as trainers into the future, and help with application of innovative possum eradication tools and techniques.

Volunteering for Friends of Flora at the top of Mt Lodestone in Kahurangi. *Photo: Regan Bridge*

7. Glossary

agency	Government department or ministry with the mandate to work on a specific issue.
ahi kā	Continuous occupation by whānau, hapū and iwi who keep their home fires burning.
community group	A group operating to provide a specific service in a community, for the public benefit of the members of the community.
eradication	Complete removal of predators.
hapū	Hapū are an extension of the wider whānau, and are mandated by the whānau to provide political and cultural expression within rohe.
hui	Gathering or meeting.
iwi	Iwi are an extension of whānau and hapū. They are also mandated to engage politically on all issues.
kaitiaki(tanga)	The exercise of guardianship by the tangata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources; and includes the ethic of stewardship.
kaupapa	Policy, purpose, scheme, proposal, programme, issue, initiative.
mātauranga	Knowledge.
ngahere	Bush, forest.
organisation	An entity or group of people working together towards a specific purpose.
rohe	Territory, area, place.
stakeholder	A person, group or organisation with interest or concern in a topic.
taiao	Earth, world, environment.
taonga	Valued resources or prized possessions.
tikanga Māori	To act in accordance with tikanga is to behave in a way that is culturally proper and appropriate.
whakapapa	Genealogy, lineage.
whānau	Family.
whenua	Land.

New Zealand Government