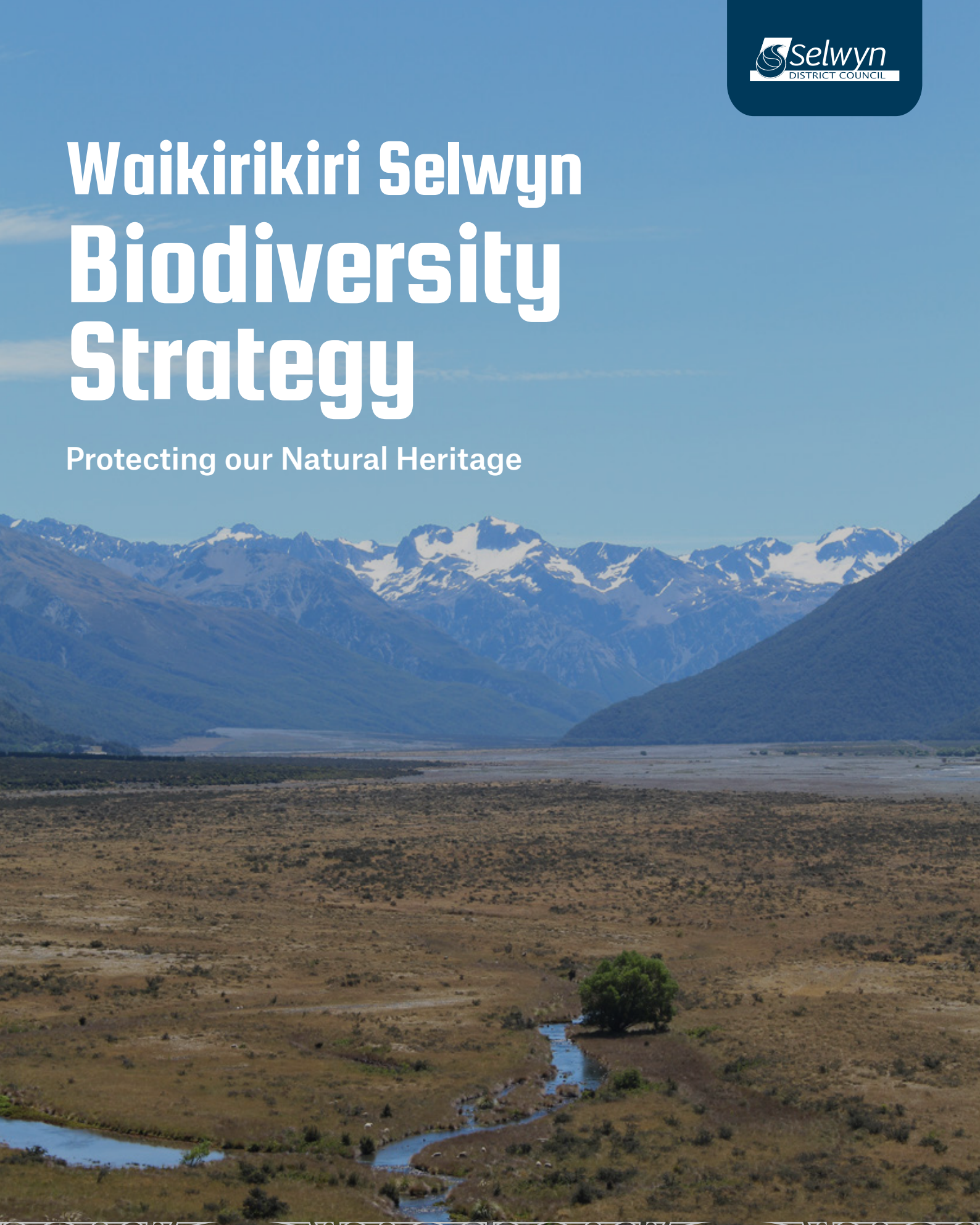
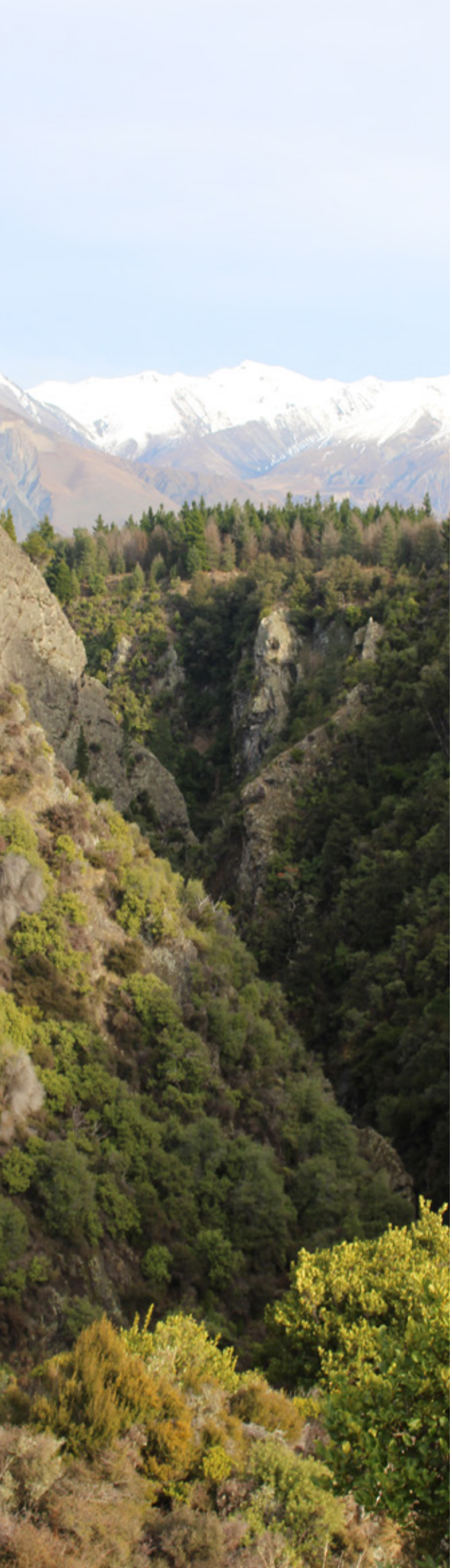
Selwyn DISTRICT COUNCIL

Waikirikiri Selwyn Biodiversity Strategy

Protecting our Natural Heritage





Contents

Mayoral Foreword

I am delighted to introduce to you the Selwyn Biodiversity Strategy. I recognise that our natural environment underpins all that we do in our district. While we know that the landscape has been modified over the centuries, it's important to ensure that our district's special indigenous flora and fauna is protected and restored.

This strategy has been developed in partnership with mana whenua, partners, stakeholders, and our wider community. Te Taumutu Rūnanga have been integral to the drafting of this document and we're very grateful for their support and involvement, including with the preparation of the Ngāi Tahu chapter. Thank you also to those who had input through the submission process on the draft strategy when we consulted with our community in late 2023.

We know that the indigenous biodiversity in the Waikirikiri Selwyn district, and across Aotearoa New Zealand, is continuing to face significant challenges, through changes in land use, urban intensification, threats from pests and predators, and our changing climate. These issues will require a mix of short and long-term solutions. Suitable capacity, support and funding will also be needed to undertake the necessary measures.

This strategy is for our whole Selwyn community. The Selwyn District Council has a key leadership role to play, but looking after our district's biodiversity will require all parts of our community to work together. We will build on the good work that's already been done by mana whenua, farmers, community groups and our partner agencies, and together we will find new and improved ways to continue to protect and manage our heritage that is our indigenous biodiversity.

The goals, targets and actions in this strategy contain a combination of what our partners and stakeholders see as important, what the Council will do and what has to be done under direction from our government, including with regard to the recently released National Policy Statement - Indigenous Biodiversity. We will work closely with mana whenua, landowners, and our community, collaborating through partnerships wherever we can.

A lot of hard work has gone into putting this strategy together, but the key to this document will be seeing it lived out, by successfully implementing the identified actions. We encourage our whole community to take ownership and responsibility for the health of our natural environment. Together we will make it happen.

Sam Broughton
Mayor of Selwyn

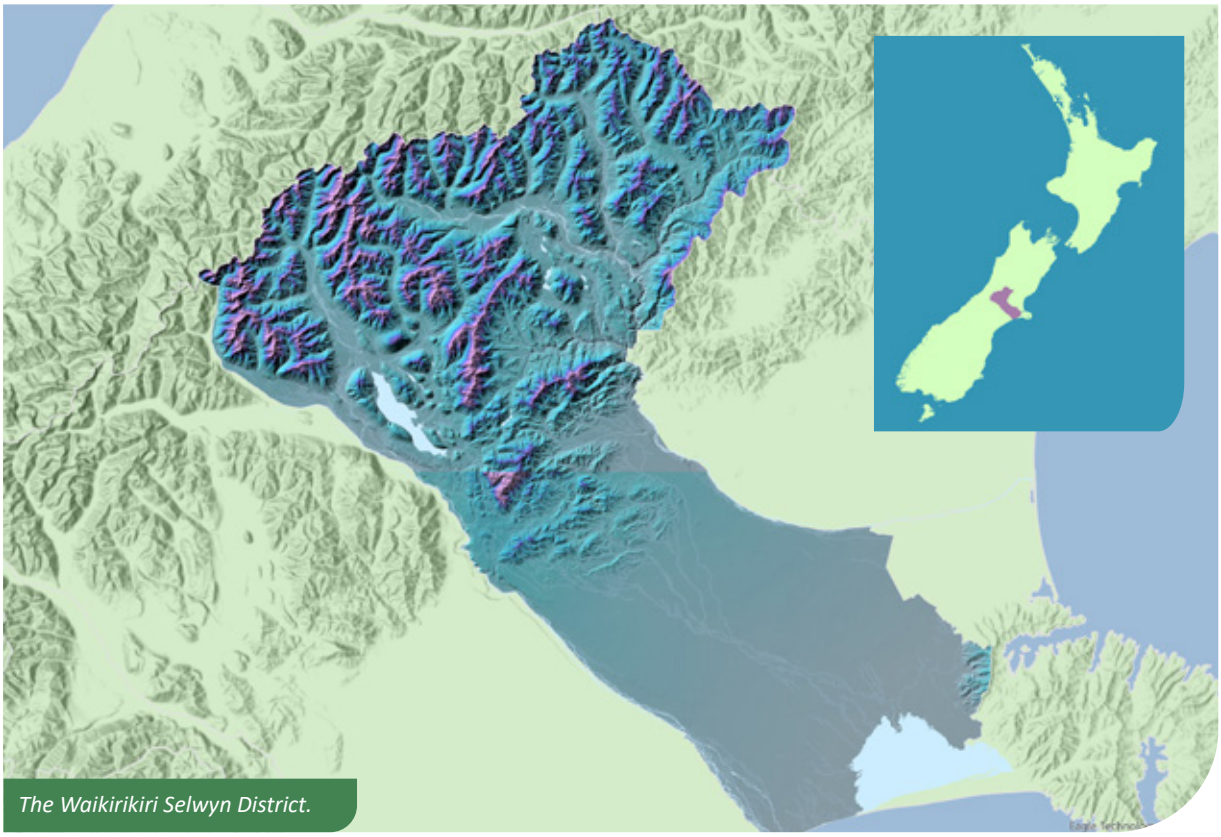
He Kupu Tauākī - Te Rautaki Matawhānui
The Strategy Vision Statement

Ko kā pūnaha hauropi, mai i kā mauka ki te moana, he mea ārai i kā momo nōhaka taketake kia tōnui ai. Inā te nui o te honoka tākaekae o te hapori ki te taiao.

E whakaū ana i te mana whenua tō rātau rakatirataka me tō rātau kaitiakitaka, ā, ko tō mātau tōnuitaka e tūhonohono ana ki tō Waikirikiri Kanorau Koiora Taketake

Ecosystems, from the mountains to the sea, and the indigenous species and habitats contained within, are protected, and thriving. Our community is enriched through a strong connection with nature.

Mana whenua are exercising their full rakatirataka and kaitiakitaka and our prosperity is intrinsically linked to Selwyn's flourishing native biodiversity.



The Waikirikiri Selwyn District.

Waimakariri river flats.

He Whakarāpopototaka
Executive Summary

Biodiversity means the 'variety of life'. The term describes the diversity of all life on land, in fresh water and the sea. This includes the genes they contain and the ecosystems in which they live. The Waikirikiri Selwyn Biodiversity Strategy (the strategy) focuses on indigenous biodiversity, that is, those species that naturally occur within Aotearoa New Zealand and the Waikirikiri Selwyn District. The strategy recognises that healthy ecosystems are critical, not only to the sustainability of indigenous biodiversity, but also to the social, cultural, spiritual, environmental, and economic fabric of our district.

The purpose of this strategy is to provide an overarching view of how the Council intends to achieve the protection, maintenance, and restoration of indigenous biodiversity within Selwyn. It establishes a strategic approach based on the concept of first protecting what remains and then restoring what has been lost, and it identifies priorities accordingly.

The strategy aims to:

- build on the good work already occurring in the district
- support and encourage the associated efforts of mana whenua, communities, landowners, and individuals
- raise awareness of biodiversity values
- facilitate the coordination of agency effort through alignment and partnerships.

The strategy provides an 'agreed-upon' framework to guide and support the Council's future biodiversity work programmes.

It establishes a shared vision and four key goals, and it identifies targets and the actions that we need to take to achieve those goals.

The strategy is aligned with the following regional targets:

- No further loss of significant habitats and ecosystems,
- An increase in biodiversity protection and restoration initiatives,
- A growing public awareness of incorporating indigenous biodiversity into working and urban landscapes,
- Biodiversity promotion,
- On-going monitoring and research,
- Partnerships that result in beneficial biodiversity outcomes.

Canoeing down the Ararira LII. Photo by Robin Smith.

For Māori, the connection with nature is one of whakapapa kinship. Māori culture and language evolved in the ecosystems and landscapes of Aotearoa New Zealand and its people are inextricably woven together with te taiao the natural world. Te Tiriti o Waitangi provides the basis for the relationship between government and mana whenua in managing indigenous biodiversity, as per the duty of active protection of Māori interests and the principle of partnership. The strategy contains a Ngāi Tahu chapter, which provides the context for indigenous biodiversity aspirations and the desired outcomes for Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri. The partnership between mana whenua and Council is key to improving biodiversity outcomes in Selwyn.

Council is required, under Section 6(c) of the Resource Management Act 1991, to recognise and provide for the protection of areas of "significant indigenous vegetation and significant habitats of indigenous fauna" on land it administers as a matter of national importance. As part of the Council's commitment to this, the strategy aims to complement and inform the Selwyn District Plan, which is the key legal document for the protection and enhancement of the environment within Selwyn.

The strategy is also aligned with other crucial documents, including the Te Mana o te Taiao Aotearoa New Zealand Biodiversity Strategy 2020, the Biodiversity Strategy for the Canterbury Region 2008, and the Mahaanui Iwi Management Plan 2013.

There are significant challenges and opportunities ahead for the management of indigenous biodiversity within Selwyn, including the protection of significant habitats, halting further loss of endangered species, the enhancement of waterways and wetlands, and the protection and restoration of a range of healthy ecosystems stretching from the mountains to the sea.

He Kupu Tauākī - Te Rautaki Matawhānui
The Strategy Vision Statement

Ecosystems, from the mountains to the sea, and the indigenous species and habitats contained within, are protected, and thriving. Our community is enriched through a strong connection with nature.

Mana whenua are exercising their full rakatirataka and kaitiakitaka and our prosperity is intrinsically linked to Selwyn's flourishing native biodiversity.

Kā Aroka Matua - Te Rautaki
The Strategy Goals

Achieving the strategy's vision will require leadership from the Council, as well as participation from and the development of partnerships with mana whenua, local communities, landowners, and the agencies.

The vision is supported by four main Goals:

1. Work in partnership with mana whenua, landowners and other stakeholders, to protect, enhance, maintain, and restore indigenous biodiversity whilst recognising the importance of mahika kai, taoka species, and culturally and historically significant sites.
2. Identify the state of indigenous biodiversity within Selwyn and develop appropriate responses in accordance with our statutory, non-statutory and mana whenua responsibilities to halt the decline of our flora and fauna.
3. Support actions by landowners and our community to protect and restore indigenous biodiversity and enhance public awareness of our natural environment.
4. Encourage and increase the integration of indigenous species across our district, including urban spaces, lifestyle blocks and waterways.

The goals are broken down into targets and actions that can be found on pages 50 to 57 of this document. The actions are listed along with contributing parties, timeframes, and potential funding sources.

Tārerekautuku Yarrs Lagoon Landcare group at the Lagoon.

1. Kupu Whakataki Introduction

1.1. What is biodiversity?

Biodiversity was first introduced as a resource management concept at the Rio Earth Summit in 1992, referring in broad terms to 'the variety of life'. The term describes the variety and diversity of all life on land, in fresh water, and the sea. This includes the genes they contain and the ecosystems on land and water in which they live.

Aotearoa New Zealand's primary legislation for managing the environment, the Resource Management Act 1991, defines biological diversity as: the variability among living organisms, and the ecological complexes of which they are part, including diversity within species, between species, and of ecosystems.

Biodiversity provides the life supporting systems that enable all organisms, including humans to survive.[1]

1.2. What is 'indigenous biodiversity'?

Indigenous biodiversity is the diversity (or range) of indigenous species. This includes diversity within and between species. Indigenous species are those species that naturally occur in our country. Aotearoa New Zealand is a global biodiversity hot spot, with many of our indigenous species found nowhere else (endemic). Because of its high level of endemism and distinctiveness, Aotearoa New Zealand's indigenous biodiversity contributes significantly to overall global biodiversity.

Endemism among Aotearoa New Zealand plants and animals is one of the highest in the world, owing largely to the country's isolation from other land masses, as well as its diverse geography and climate, which has allowed for the development of our unique flora and fauna.

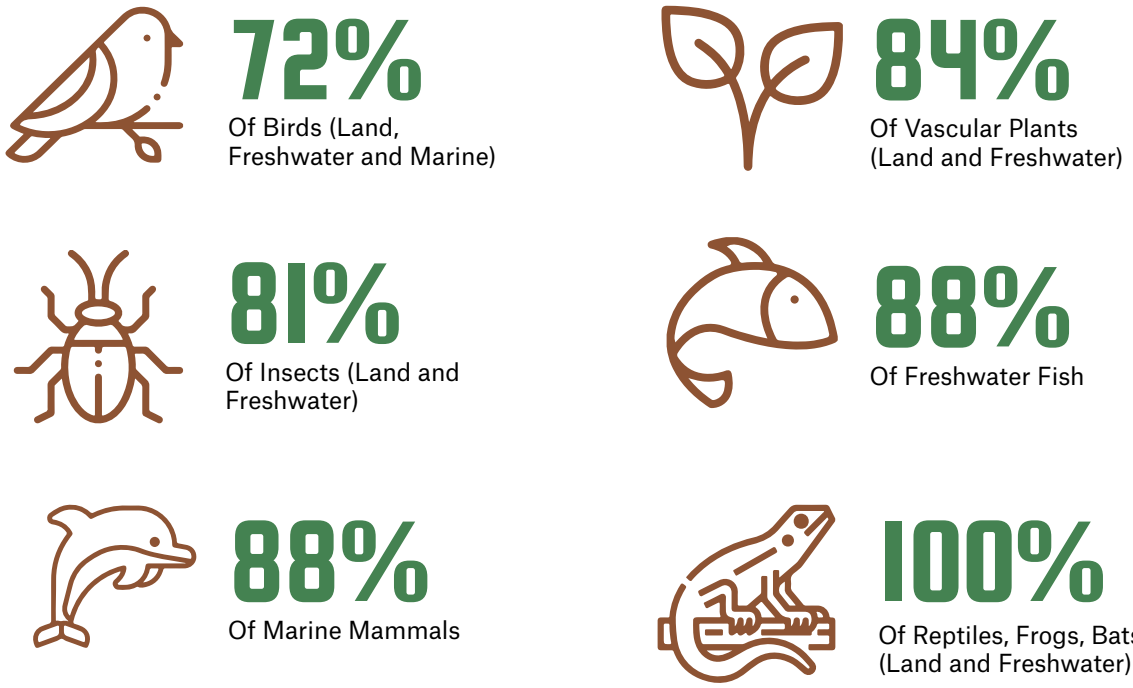


Figure 1: Proportion of Aotearoa New Zealand's indigenous species found nowhere else on Earth. Note: This data does not include extinct species. Source: Biodiversity in Aotearoa[1].

[1] *https://www.doc.govt.nz/globalassets/documents/conservation/biodiversity/anzbs-2020-biodiversity-report.pdf*

The list of New Zealand species known to have become extinct since human settlement includes one bat, 62 birds, three frogs, three lizards, one freshwater fish, seven plant species, and a number of invertebrates[2].

1.3. Why is indigenous biodiversity important?

The indigenous biodiversity of this country is important to the environment, culture, society, and economy of Aotearoa New Zealand. Our biodiversity provides for the life supporting systems that enable all life on earth to survive. Wetlands purify water and aid in the prevention of flooding and drought.

River flood plains contribute to managing floods, they naturally replenish aquifers and provide vital habitat for native species. Indigenous forests serve as carbon sinks while also purifying the air we breathe. Healthy ecosystems provide food, medical properties, and a range of other resources. Indigenous biodiversity shapes our local and cultural identity while also sustaining our primary and tourism industries. For Māori, the connection with nature is one of whakapapa kinship. Māori culture and language evolved in the ecosystems and landscapes of Aotearoa New Zealand and are inextricably woven with them.

Royal Spoonbill Kōtuku ngutupapa (Platalea regia) photo by Steve Attwood.

[2] *https://www.unep.org/resources/kunming-montreal-global-biodiversity-framework*

2. Te Rautaki The Strategy

2.1. The purpose of the strategy

The purpose of this strategy is to provide guidance and a common focus for policy and decision making, resource allocation, voluntary effort, and on-the-ground projects and initiatives related to indigenous biodiversity management in Selwyn. It aims to build on the good work already occurring, raise awareness of biodiversity values, facilitate the coordination of agency effort through alignment and partnerships, and support and encourage the efforts of communities, landowners, and individuals.

The strategy establishes a shared vision and four key goals. It identifies the actions that we need to take to achieve those goals, who has a role to play in those actions, the potential sources of funding, and the framework for the development of the three yearly Biodiversity Work Programme. It establishes a strategic approach based on the general concept of first protecting what remains, and then restoring what has been lost, and identifies priorities accordingly.

On an international level Aotearoa New Zealand is party to the Convention on Biological Diversity (CBD) This promotes the development of global targets, national strategies and action plans for the conservation and sustainable use of biodiversity.

In December 2022, Convention on Biological Diversity parties agreed to the Kunming-Montreal Global Biodiversity Framework[3], under which they committed to contribute to four global goals and 23 global targets to halt and reverse biodiversity loss by 2030. As a party to CBD, New Zealand is required to have a national biodiversity strategy and action plan. Through the strategy and action plan, New Zealand delivers its obligations under the CBD, expressing our commitment to stem the loss of biodiversity worldwide.

Council is required, under Section 6(c) of the Resource Management Act, 1991 (RMA), to recognise and provide for the protection of areas of "significant indigenous vegetation and significant habitats of indigenous fauna" on land it administers as a matter of national importance. In order to give effect to the RMA, Council has the following functions (under s31):

- The establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the effects of the use, development, or protection of land and associated natural and physical resources of the district; and
- The control of any actual or potential effects of the use, development, or protection of land, including for the purpose of the maintenance of indigenous biological diversity.

The strategy is informed and guided by these key documents:

- **Te Mana o te Taiao Aotearoa New Zealand Biodiversity Strategy 2020** – which sets out a strategic framework for the protection, restoration and sustainable use of biodiversity, particularly indigenous biodiversity, in Aotearoa New Zealand from 2020 to 2050. Collaboration and partnerships are a key focus in Te Mana o te Taiao.
- **Biodiversity Strategy for the Canterbury Region 2008** – is a non-statutory document for the Canterbury region that establishes a framework of goals and priorities for undertaking biodiversity initiatives.
- **Canterbury Regional Land and Water Plan** - which provides clear direction on how land and water are to be managed in the region.
- **Canterbury Regional Policy Statement** - provides an overview of the resource management issues in the Canterbury region, and the objectives, policies, and methods to achieve integrated management of natural and physical resources.
- **Canterbury Regional Pest Management Plan** – provides the regulatory requirements for priority plant and animal pests across the region.
- **Selwyn District Plan** - which is the key legal document for the protection and enhancement of the environment within the Selwyn District.

[3] *https://www.unep.org/resources/kunming-montreal-global-biodiversity-framework*

- **Mahaanui Iwi Management Plan 2013** - contains a comprehensive suite of policies and objectives addressing the range of resource and environmental management matters of significance to mana whenua.
- **The Canterbury Water Selwyn-Waihora Zone Committee Zone Implementation Programme (ZIP) -** recommends actions, responsibilities, and timeframes for activities to help achieve the principles, targets and goals set out in the Canterbury Water Management Strategy (CWMS).
- **National Policy Statement for Indigenous Biodiversity 2023 (NPS-IB)** – which sets out the objectives and policies to identify, protect, maintain, and restore indigenous biodiversity under the RMA.
- **Climate Change Response Act (2002)** – a legal framework that enables New Zealand to develop clear and stable policies to limit global warming to 1.5° celsius above pre-industrial levels; and to allow New Zealand to prepare and adapt to the effects of climate change.

The objective of the National Policy Statement for Indigenous Biodiversity is:

(a) to maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity after the commencement date; and

(b) to achieve this:

(i) through recognising the mana of tangata whenua as kaitiaki of indigenous biodiversity; and

(ii) by recognising people and communities, including landowners, as stewards of indigenous biodiversity; and

(iii) by protecting and restoring indigenous biodiversity as necessary to achieve the overall maintenance of indigenous biodiversity; and

(iv) while providing for the social, economic, and cultural wellbeing of people and communities now and in the future.

The strategy provides an overarching view of how Council intends to achieve protection, restoration, maintenance, and management of indigenous biodiversity within Selwyn. The strategy provides an 'agreed to' framework to guide and support the Council's future biodiversity work programmes. As an outcome of the strategy, a Biodiversity Working Group will be formed to develop the three yearly Biodiversity Work Programme.

As a non-statutory document with the same intent as the Biodiversity Strategy for the Canterbury region 2008, this strategy is aligned with the following key regional targets:

1. No further loss of significant habitats and ecosystems.
2. An increase in biodiversity protection and restoration initiatives.
3. A growing public awareness of incorporating indigenous biodiversity into working and urban landscapes.
4. Biodiversity promotion.
5. On-going monitoring and research.
6. Partnerships which result in beneficial biodiversity outcomes.

The strategy recognises and seeks to align itself with other biodiversity initiatives through an integrated approach that promotes co-operation and collaboration between mana whenua, the Selwyn community, landowners and occupiers, industry, and government agencies.

Tārerekautuku Yarrs Lagoon, looking towards the Port Hills.

The strategy will:

- Set the strategic direction for Council regarding indigenous biodiversity within the Selwyn district.
- Identify opportunities for recognising and providing for mana whenua values in accordance with the Mahaanui Iwi Management Plan 2013 and other relevant Iwi Management Plans.
- Provide a framework for implementing the protection, maintenance, and restoration of Selwyn's indigenous biodiversity (though identified actions).
- Advocate for the collation of baseline monitoring for indigenous biodiversity in Selwyn and identify associated threats and opportunities.
- Clarify opportunities and roles for our community, landowners and occupiers, and stakeholders to lead, assist with and input into indigenous biodiversity planning and actions.
- Consider the effects of climate change on indigenous biodiversity.
- Raise awareness and understanding of indigenous biodiversity in Selwyn.
- Identify and apportion biodiversity roles and responsibilities across Council management teams.
- Guide and inform key Council documents including:
    - Council Long-Term Plans and Infrastructure Strategies
    - Waikirikiri Ki Tua Future Selwyn Strategy
    - The Selwyn District Plan.

Fantail Pīwakawaka (Rhipidura fuliginosa).

2.2. Strategy Implementation

The strategy will be implemented through the formation of a Biodiversity Working Group comprised of iwi, agency representatives and stakeholders. The group will lead the preparation of a three yearly Biodiversity Work Programme which will include the following key components:

- A range of initiatives to give effect to the goals and actions within the Strategy
- Prioritisation of the identified initiatives, based on factors including their expected effectiveness, acceptability to Council and the Selwyn community, and associated risks
- Anticipated costs, budgets, and timelines
- Key funding sources and availability
- Identification of responsibility for implementing actions.

The work programme and the associated Council funding required to carry out the identified actions will be developed in accordance with Councils Long-Term Plan (LTP) process. The financial implications to Council of various options and features will be identified and considered prior to the actions being funded and implemented.

2.3. Strategy Timeframes

The strategy's timeframes commence on formal endorsement by the Council, and it is to be reviewed at least every five years (starting in 2029) for effectiveness and efficiency. Due to the rapidly changing environment, including regulatory, environmental and climate, it is envisaged that these timeframes are suitable to help ensure that the strategy stays relevant and up to date.

2.4. Annual progress review

Council Biodiversity staff will be responsible for completing an Annual Progress Review each year, which will be reported to Council, Rūnaka, and the community. This review will highlight the achievements of the preceding year in biodiversity matters, measure progress against the strategy's goals, targets, and actions, and monitor timeframes.

Road side vegetation — Cabbage Tree Tī Kōuka (Cordyline australis).

3. Kanorau Koiora ki Waikirikiri

Biodiversity in Selwyn

3.1. Selwyn's Landscapes and Ecosystems

From the mountains to the sea, Selwyn is large, varied, and ecologically fascinating. Selwyn encompasses a diverse spectrum of culturally and ecologically significant environments, including rising mountains cloaked with mountain beech, extensive high country tussocklands, major braided river systems, highly productive alluvial plains, freshwater lakes and wetlands, and coastal aquatic environments.

Selwyn covers approximately 650,000 hectares, with the Canterbury Plains and foothills accounting for 54% of that area. The remaining land is primarily classified as high country or alpine, dominated by steep land that is sparsely populated.

Selwyn contains significant and 'naturally uncommon ecosystems' that often have highly specialised and distinctive assemblages of flora and fauna. Many of these ecosystems have been affected by land use changes, predominantly from deforestation, land clearances, and agriculture.

Waimakariri River braids.

These 'uncommon ecosystems' include:

- Outwash gravels (Critically Endangered) - outwash gravel plains occur in intermontane basins and are formed on terraces comprising late-Otiran fluvioglacial materials. These materials originated from the meltwater of retreating glaciers of this period.
- Braided rivers (Endangered) - globally, braided rivers occur only in mountainous, glaciated areas where natural gravel production, river flows and gentle gradients allow them to form.
- Limestone outcrops (Vulnerable) – limestone outcrops can be cliffs or tors which provide many varied habitats – from bare rock that can only be colonised by mosses and lichens to deeper soils supporting woody vegetation. Some limestone outcrops are important sites of both ancient depositional fossils and New Zealand biota that has become extinct since humans arrived.
- Lake Margins (Vulnerable) - lake margin vegetation ranges from periodically inundated forest, through tall reedland and rushland, to sedgeland and herbfield, and down to open land with only scattered herbs on rocky lake shores as in many eastern South Island lakes.
- Seepage and Flushes (Endangered) - seepages and flushes form where groundwater emerges on hillsides to form soils that are mostly permanently saturated with relatively nutrient and oxygen rich water.

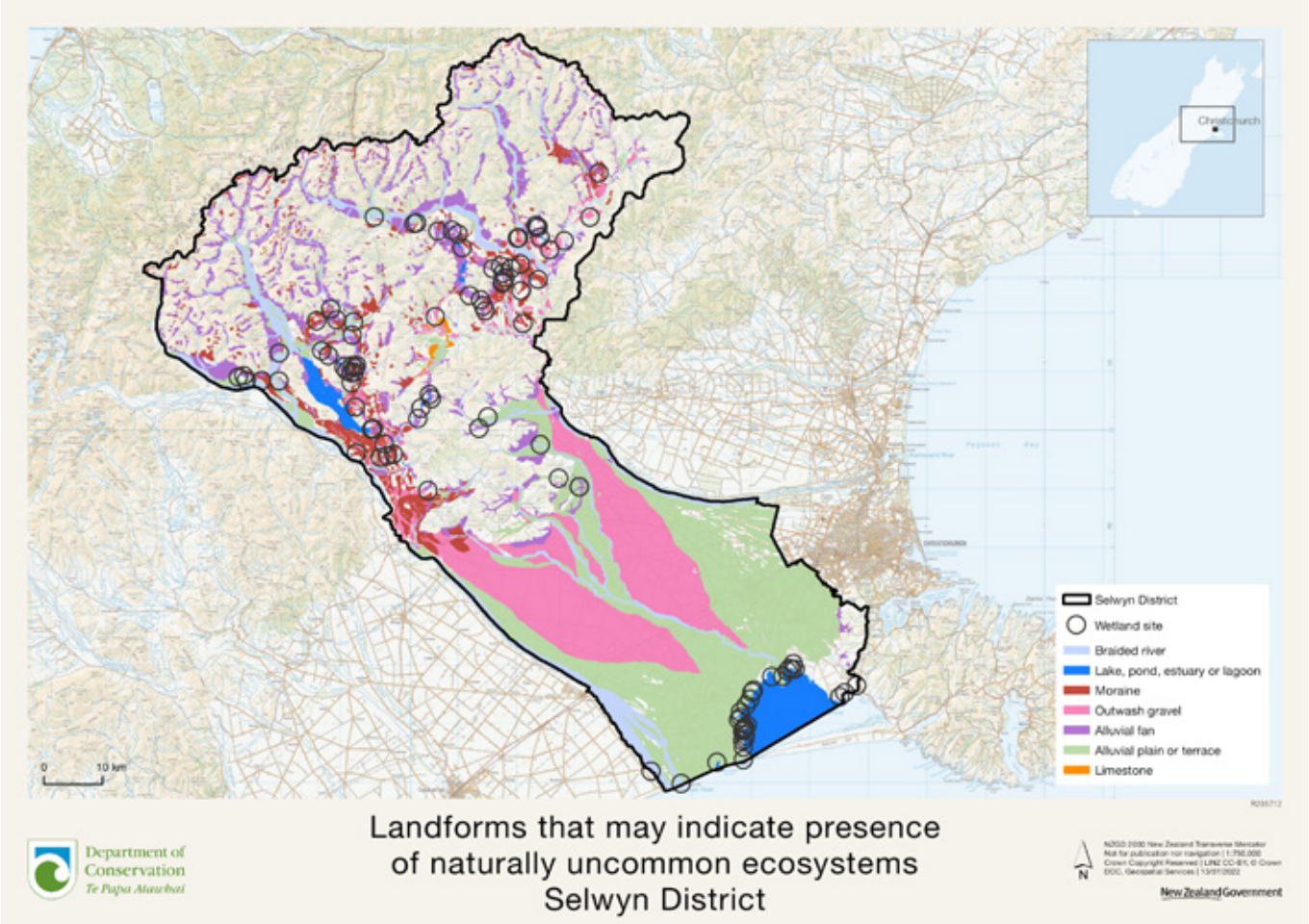


Image from Department of Conservation and Mike Harding.

A brief description of some of Selwyn's broad landscape types:

Landscape types	General description	Significant indigenous vegetation and habitat	At risk - threatened indigenous flora and fauna	Key threats
Montane and subalpine	High mountain areas with fragile ecosystems, severe climatic extremes. Includes Arthurs Pass National Park, Craigieburn Forest Park, Rangitata/ Rakaia Head Waters Conservation Area, and the Central Southern Alps Conservation Area.	Sub-alpine and montane tall tussock grasslands, scree communities, and montane herbfields. Cedar and totara forests.	Kea *(Nestor Notabilis).* NZ Falcon Kārearea *(Falco Novaeseelandiae)* Alpine Grasshoppers *(Brachaspis Nivalis, Sigaus Australis).* Rock Wren Pīwauwau *(Xenicus Gilviventris).*	Invasive species (both plant and animal). Climate change effects. Harmful and inappropriate use by recreationalists. Lead poisoning. Human interactions.
High country	Iconic landscapes consisting of steep slopes, intermontane basins, terraces, and fans. Depositional landforms and glacial features. Contains large areas of Crown Pastural Lease managed by Land Information New Zealand under the Crown Pastural Land Reform Act 2022 which is leased on a long-term basis for pastural farming. Includes areas of University of Canterbury endowment land.	Extensive montane tall and short tussock grasslands, along with remnant native 'grey scrub' shrublands and beech forest communities. Includes Limestone outcrops that provide habitat for rare and distinctive plant species.	Alpine Grasshoppers *(Brachaspis Nivalis, Sigaus Australis).* NZ Falcon Kārearea *(Falco Novaeseelandiae).* Mistletoes *(Alepis Flavida And Peraxilla Tetrapetala).* Orange Fronted Kākāriki *(Cyanoramphus Malherbi).* Yellowhead Mohua *(Mohoua Ochrocephala).* Blue Duck Whio *(Hymenolaimus Malacorhynchos).* Great Spotted Kiwi *(Apteryx Haastii).* Matagouri *(Discara Toumatou).*	Vegetation clearance, land use intensification, invasive species, wildfires. Harmful and inappropriate use by recreationalists. Invasive species (both plant and animal, including pigs).
High country lakes, rivers, waterways, tarns and wetlands	Highly valued for their biodiversity and cultural significance, and scenic qualities. Formed through glacial activity and subsequently modified by rivers, fans and wave action, creating a wide variety of wetland habitats. Typically, highly stable water levels, fed by rain and snowmelt.	Support diverse plant communities such as tall reed-beds, tussocklands, swamplands and significant turflands, which include the endemic aquatic fern *(Pilularia novae-zelandiae)* The wider Coleridge Basin contains significant wetland areas and exceptional habitat for braided river birds. Shoreline vegetation is generally sparse and low growing.	Australasian Crested Grebe Peteketeke *(Podiceps Cristatus).* Australasian Bittern Matuku-Hūrepo *(Botaurus Poiciloptilus).* Longfin Eel Ōrea *(Anguilla Dieffenbachii).* Kōaro (Climbing Galaxias) *(Galaxias Brevipinnis).* NZ Falcon Kārearea *(Falco Novaeseelandiae).* Kea *(Nestor Notobilis).*	Surrounding land use development and intensification, nutrient enrichment. Harmful and inappropriate use by recreationalists. Climate change effects. Wildfires. Invasive species (both plant and animal). Impacts of predators including feral cats on indigenous wildlife.
Foothills	Sequence of downlands and foothills, characterised by rolling hills, gullies, river valleys, ephemeral streams, riparian and seepage wetlands.	Substantially modified habitats, supporting exotic pasture and forestry, but with widespread areas of regenerating native vegetation, including pockets of remnant mountain beech forest, modified tussock grassland, and rush lands.	Canterbury Mudfish Kōwaro *(Neochanna Burrowsius).* NZ Falcon Kārearea *(Falco Novaeseelandiae).* Kea *(Nestor Notobilis).*	Land use development and intensification, and wildfires. Harmful and inappropriate use by recreationalists. Climate change effects. Invasive species (both plant and animal). Impacts of predators including feral cats on indigenous wildlife.

Braided rivers	Geologically unusual and 'naturally uncommon', complex ecosystems. Numerous diverging and rejoining channels separated by shifting gravel islands. The Rakaia and Waimakariri Rivers are the largest braided rivers in Aotearoa New Zealand and have been recognised as having 'an outstanding natural characteristic in the form of a braided river'.	These rivers form a vital ecological link from the mountains to the sea and are important habitat (feeding and breeding) for bird species adapted to braided river habitat. Support endemic plant and animal communities.	Wrybil Ngutu Pare *(Anarhynchus Frontalis).* Black Fronted Terns Tarapiroe *(Chlidonias Albostriatus).* Black Billed Gulls Tarāpuka *(Chroicocephalus Bulleri).* Banded Dotterel Tūturiwhatu *(Charadrius Bicinctus).*	River encroachment and confinement between flood protection barriers, adjacent agricultural development, and irrigation requirements. Climate change effects. Harmful and inappropriate use by recreationalists. Invasive species (both plant and animal).
Alluvial plains	Expansive, alluvial plains, consisting of highly modified landscapes and ecosystems, including urban settlements.	Highly modified and fragmented remnants (with <10% of original indigenous cover remaining), including dryland and woody ecosystems (among New Zealand's least protected and most threatened native ecosystems) which survive in these free-draining soils with naturally low rainfall.	NZ Falcon Kārearea *(Falco Novaeseelandiae).* Canterbury Plains Tree Daisy *(Olearia Adenocarpa).*	Land use changes and intensification. Edge effects. Invasive species (both plant and animal). Wildfires.
Water race and drainage network	Man-made or modified bodies of water that include irrigation canals, water races, and drains, including several thousand kilometres of classified drains in the Te Waihora Lake Ellesmere catchment.	These are living systems that are frequently the last refuges of native plants and animals that live in and near water.	Canterbury Mudfish Kōwaro *(Neochanna Burrowsius).* Bluegill Bully *(Gobiomorphus Hubbsi).*	Effects of standard maintenance practices such as sediment and aquatic weed removal. Land use changes and intensification, and other disturbances to water quality and quantity. The closing of water races.
Lowland waterways, wetlands and springs	Low-permeable soils that once supported extensive wetlands prior to human settlement and land drainage, now consists of modified network of waterways, overland flow paths, and groundwater-fed springs and seeps. Valued by takata whenua as mahika kai or wāhi tapu sites.	Ecologically significant freshwater ecosystems (with <10% of the region's previously extensive freshwater wetlands remaining), supporting native aquatic and riparian plant species.	Freshwater Crayfish Kōura *(Paranephrops Zealandicus).* Shortfin Eel *(Anguilla Australis).* Canterbury Galaxias *(Galaxias Vulgaris).* Alpine Galaxias *(Galaxias Paucispondylus).* Upland Longjaw Galaxias *(Galaxias Prognathous).* Swamp Nettle (*Urtica Perconfusa*).	Human-induced changes that potentially alter their hydrology, such as excess sediment, nutrients, stormwater runoff and other contaminants. Invasive species (both plant and animal). Climate change effects.
Volcanic hills	Exceptional volcanic skyline, rock spurs, rolling pastoral hill slopes, tussock grasslands, and regenerating bush areas, of special significance for their environmental, geological, and scenic values. Much of the Southern Port Hills are in the Selwyn District. Public reserves in the area contain some of the finest examples of native bush close to the population centres of Lincoln and Rolleston.	Small, fragmented native vegetation remnants, including ecologically important broadleaf forest and regenerating bush in wetter gullies, and tussock grasslands intermixed with introduced grasses at higher altitudes. Rocky outcrops provide microclimates and contain relatively intact ecological communities. Bush fragments support valued native invertebrate, lizards, and bird communities.	Mingimingi *(Coprosma Virescens).* Fragrant Tree-Daisy *(Olearia Fragrantissima).*	Land use changes and intensification. Wildfires. Edge effects. Invasive species (both plant and animal). Impact of feral pigs and deer. Climate change effects.

Coastal areas	A number of notable coastal habitats and ecosystems, despite a relatively limited length of coastline (about 12 km excluding Kaitorete), including a coastal hāpua lake lagoon Te Waihora Lake Ellesmere, the Rakaia River mouth and lagoon, Muriwai Coopers Lagoon and several freshwater coastal backwaters.	Important coastal vegetation and salt marsh mudflats along the margins of Te Waihora Lake Ellesmere. Important habitat network for migrating and wintering wading birds.	Australasian Bittern Matuku-hūrepo *(Botaurus Poiciloptilus).* Heron Kōtuku *(Ardea Alba).* Pīngao *(Ficinia Spiralisa).*	Climate change effects, sea level rise, saltwater inundation, extreme weather events, earthquakes. Harmful and inappropriate use by recreationalists. Invasive species (both plant and animal).

Kea (Nestor notabilis). Photo by Steve Attwood.

3.2. Special Features of Selwyn's Biodiversity (flora and fauna)

Fungi in Beech Forest.

Sigaus nivalis (short-horned grasshopper).

Clematis paniculata.

Selwyn is home to several threatened species including:

- Castle Hill buttercup *(Ranunculus paucifolius)* - Threatened – Nationally Critical. This species is endemic to limestone areas of the South Island High Country. Plants are vulnerable to browse damage from rabbits, hares and sheep, weeds are a constant threat, and seedlings are rarely seen.[4]
- Castle Hill forget-me not *(Myosotis colensoi)* - Threatened – Nationally Critical. The habitat of this plant is limited to limestone talus and thin soils over limestone rock.[5]
- Castle Hill bittercress *(Cardamine magnifica)* – Threatened – Nationally Critical. This species is endemic to Castle Hill Basin (including Castle Hill, Gorge Hill and Prebble Hill). The plant inhabits fine-grained limestone scree.[6]
- Maniototo peppercress *(Lepidium solandri)* - Nationally Critical - This species is endemic to the Eastern South Island primarily in limestone areas.
- *Gingidia enysii var. enysii* – Threatened – Naturally Endangered. This species is endemic to the South Island, Castle Hill, Prebble Hill Cave Creek and Broken River. The plant inhabits limestone outcrops and associated talus slopes with montane habitats.[7]
- *Olearia adenocarpa* – Threatened – Nationally Critical. This species is endemic to the Canterbury Plains, known only from two populations bordering the Waimakariri and Rakaia Rivers. The total number of known plants is less than 650.[8]
- Armstrong's whipcord *(Veronica armstrongii)* – Threatened – Nationally Endangered. This species is endemic to the South Island, Canterbury. Populations are known from near Castle Hill.[9]
- *Veronica cupressoides* – Threatened – Nationally Endangered. This species is endemic to the Eastern South Island. It is a plant of grey scrub communities.[10]

---

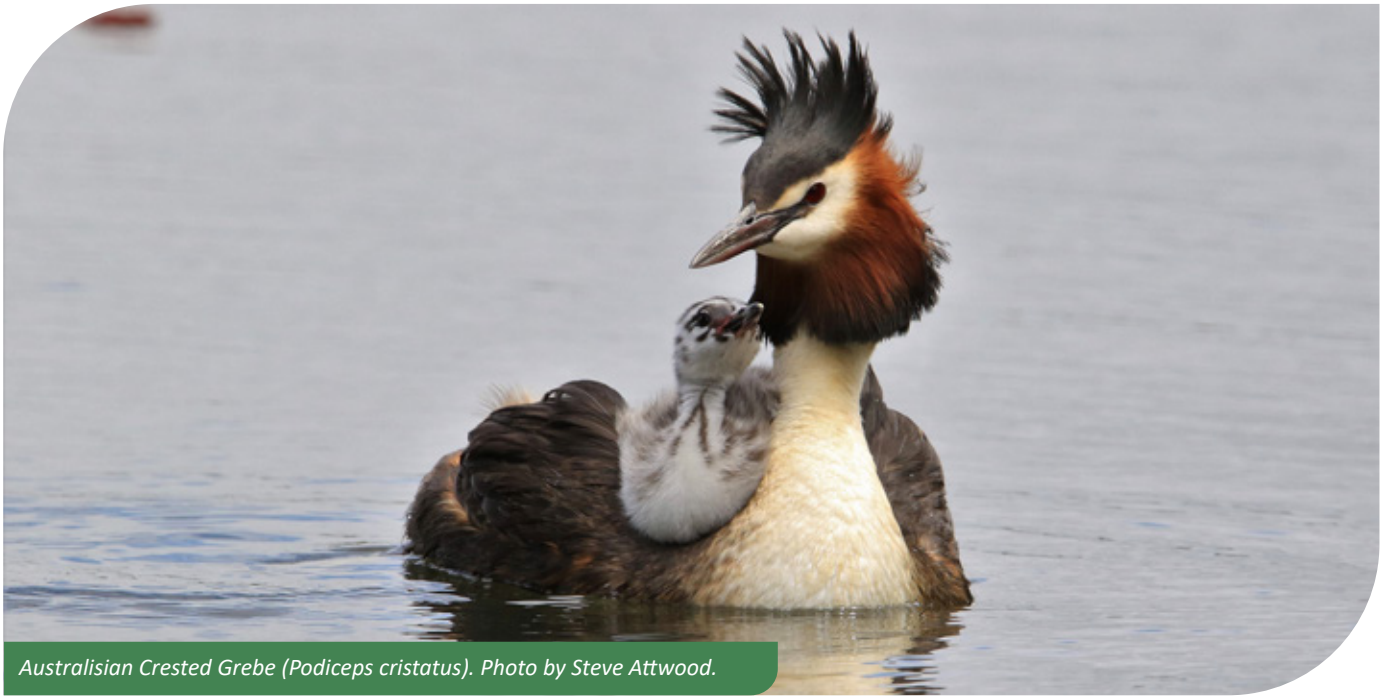
[4] https://www.nzpcn.org.nz/flora/species/ranunculus-paucifolius/
[5] As cited de Lange, P.J. (2023a). Myosotis colensoi Fact Sheet. New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/myosotis-colensoi/ (29/06/2023)
[6] As cited de Lange, P.J. (2023b). Cardamine magnifica Fact Sheet. New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/cardamine-magnifica/ (29/06/2023)
[7] As cited de Lange, P.J. (2023c). Gingidia enysii var. enysii Fact Sheet. New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/gingidia-enysii-var-enysii/ (29/06/2023)
[8] As cited de Lange, P.J. (2023d). Olearia adenocarpa Fact Sheet. New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/olearia-adenocarpa/ (29/06/2023)
[9] As cited de Lange, P.J. (2023e). Veronica armstrongii Fact Sheet. New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/veronica-armstrongii/ (29/06/2023)
[10] As cited de Lange, P.J. (2023f). Veronica cupressoides Fact Sheet. New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/veronica-cupressoides/ (29/06/2023)

- Everlasting daisy *(Helichrysum dimorphum)* – Threatened – Nationally Endangered. This species is endemic to the South Island. A plant of lowland montane situations usually found on river terraces and alongside river gorges and is primarily and associated with matagouri. It is presently only known from the Poulter, Esk and Puffer catchments where they drain into the Waimakariri River[11]
- Canterbury limestone wheat grass *(Australopyrum calcis* subsp. *Optatum*) Threatened – Nationally Endangered Endemic. Known from Castle Hill, Prebble Hill, and Flock Hill.
- Kea *(Nestor notobilis)* Threatened – Nationally Endangered. Kea are the only mountain parrot species in the world and now number fewer than 5,000 individuals in the wild. They occur throughout the mountain lands of the district and are frequently visible in and around Arthur's Pass Village, Arthur's Pass National Park. and the ski fields.
- Orange fronted kākāriki *(Cyanoramphus malherbi)* Threatened – Nationally Critical. They are restricted to four beech forest valleys in the South Island: the Hawdon, Andrews and Poulter valleys in Arthur's Pass National Park and the south branch of the Hurunui valley.
- Yellowhead Mohua *(Mohoua ochrocephala)* – Declining. They are sparrow-sized forest songsters. They were once one of the most common and conspicuous birds of the South Island forests. Since the 1970s their range contraction has been dramatic, with many of the small and scattered populations disappearing. They reside in the Hawdon valley.

The endangered Castle Hill Buttercup (Ranunculus paucifolius). Photo by Melissa Hutchinson.

[11] *As cited de Lange, P.J. (2023g). Helichrysum dimorphum Fact Sheet. New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/helichrysum-dimorphum/ (29/06/2023)*

- Australasian bittern Matuku-hūrepo *(Botaurus poiciloptilus)* - Threatened – Nationally Critical. Te Waihora Lake Ellesmere is a strong hold of this species in Canterbury, the total population of these birds in New Zealand is 1,000.
- Australasian Crested Grebe Pūteketeke *(Podiceps cristatus)* - Threatened – Nationally Vulnerable. This bird is found on several high country lakes in the District. Lake Pearson Moana Rua has been designated a wildlife refuge to help protect the grebe.
- Canterbury mudfish Kōwaro *(Neochanna burrowsius)* - Threatened – Nationally Critical. Of the five species of mudfish in New Zealand the Canterbury mudfish is the most threatened. Remnant populations survive in water races and classified drains around the district. However, they are vulnerable to disturbance through maintenance regimes and fickle water flows.



Australisian Crested Grebe (Podiceps cristatus). Photo by Steve Attwood.

Key point - changes in land use due to agricultural and urban development and the draining of wetlands have resulted in highly fragmented populations of Canterbury Mudfish kōwaro across the Canterbury Plains between the Ashley River (in the north) and the Waitaki River (in the south). Selwyn contains a large portion of the species' range, primarily in the Selwyn Waikirikiri Catchment. These remnant populations are vulnerable to disease and changes in environmental conditions such as changes in water temperature and levels, which can influence whether or not spawning occurs. Unsuccessful spawning can result in population extinction due to a lack of recruitment.

Kōwaro Canterbury Mudfish (Neochanna burrowsius).

Threatened and At Risk vascular plant species assessed in 2013 and 2018/2019

Category	Total 2023	Total 2018/2019
Extinct	2	2
Threatened: Nationally Critical	14	26
Threatened: Nationally Endangered	14	20
Threatened: Nationally Vulnerable	23	31
At Risk: Declining	49	73
At Risk: Naturally Uncommon	67	69
At Risk Recovering	1	2
At Risk: Relict	0	3
Data Deficient	21	21
TOTAL	191	246

Table 1: Threatened and At Risk vascular plant species

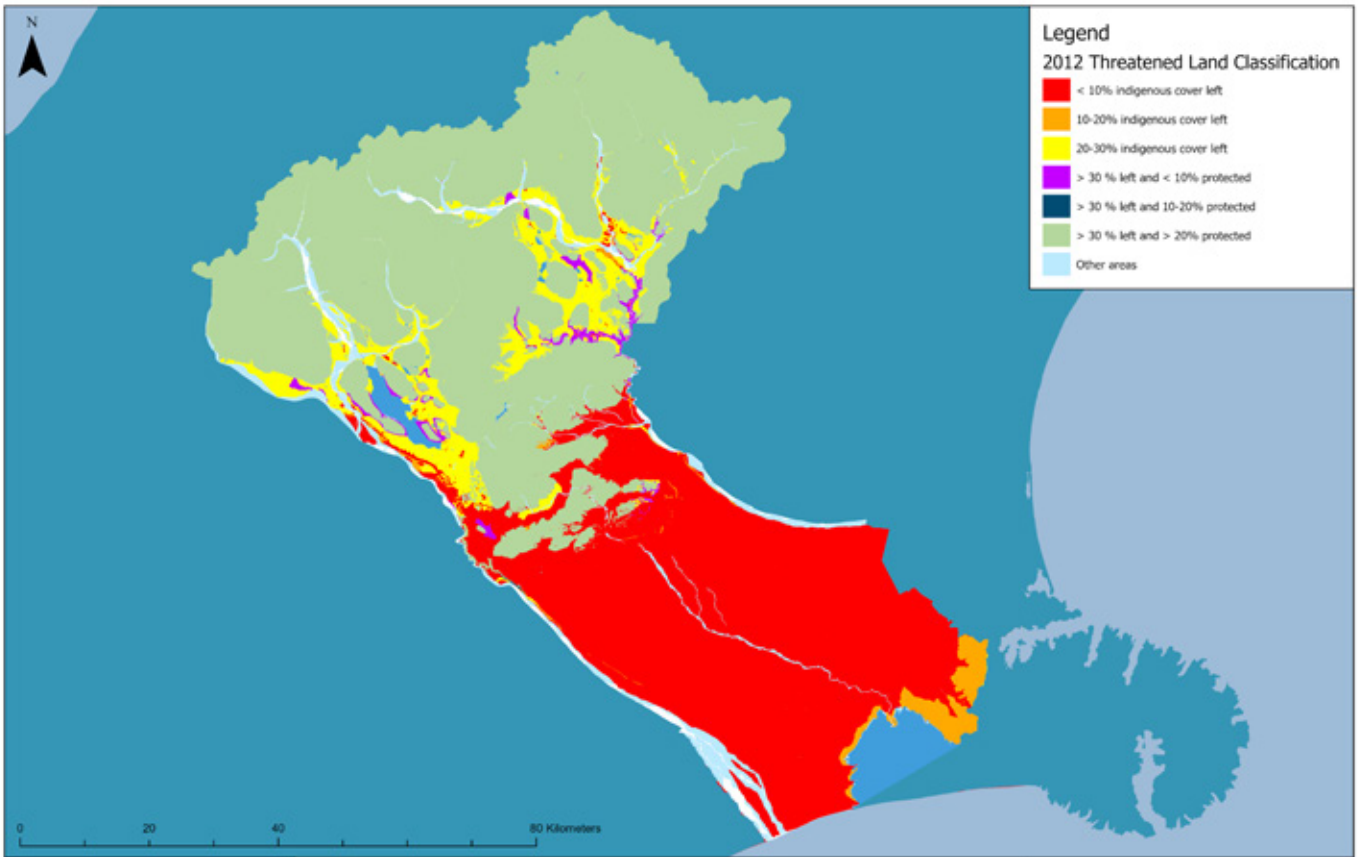
The number of vascular plants listed as Threatened or At risk has increased 29% since 2013.

3.3. What are the causes of Selwyn's indigenous biodiversity loss?

Natural ecosystems are directly threatened by pressures such as changes in terrestrial, freshwater, and the marine environments. Indirect pressures, such as not having the right 'systems' in place, people lacking the necessary knowledge or resources to act, and a disconnect between people and nature, are causing and contributing to these direct pressures.

The five overarching pressures impacting biodiversity globally include:

- Habitat loss and modification, through land use changes
- Introduced invasive species - including animal and plant pests
- Pollution
- Climate change
- Urban growth pressures.



Waikirikiri Selwyn's Threatened Environments Classification.

3.3.1 Habitat Loss and Modification

Since the arrival of humans, land use change has had the greatest impact on indigenous biodiversity. Forests have been burned and cleared, wetlands drained, and drylands cultivated and irrigated, resulting in the extinction of indigenous species (both flora and fauna).

Habitat fragmentation is an issue that occurs when parts of a habitat are destroyed, leaving smaller, unconnected areas behind. As the distance between suitable habitats increases, the ability of some species to move through the landscape is restricted, and populations become isolated. This can leave populations vulnerable to environmental disturbance and loss of genetic diversity, potentially leading to extinction in the worst-case scenario.

The rate of species loss increases as habitat size decreases, as the remaining habitat cannot support the same numbers, whether due to food resources, competition, or breeding habitat. When the amount of available habitat falls below 20% of its original extent, the rate of biodiversity loss accelerates dramatically. Smaller areas of habitat may be more vulnerable to weed invasion and edge effects (such as wind desiccation).

The Canterbury hill and high country has seen a significant increase in intensive agricultural land use over the last 30 years. Much indigenous shrub and grassland habitat has been lost as a result of pastoral farming development (including oversowing, cultivation, and direct drilling), resulting in direct habitat loss for indigenous species.

Key point - the Upper Rakaia catchment had the most agricultural development since 1990 (3918 ha) of the four Canterbury catchments studied. Most of the development (2230 ha) occurred between 2009 and 2012, but there has also been significant (1189 ha) new development during the most recent monitoring interval between 2013-2019. Prior to 1990, most development occurred at the lower/downstream end of the catchment, whereas most post-1990 development occurred further inland/upstream.

Landscape greening - an example of agricultural intensification in the High Country.

Case Study

Predator Free 2050

Predator Free 2050 is an ambitious target to eradicate mustelids (stoats, ferrets and weasels), rats (Norway, ship and kiore), and possums from all of Aotearoa New Zealand by 2050. These species were chosen because collectively they inflict the worst damage of all the introduced predators on our flora and fauna.

Communities will play a critical role in Aotearoa New Zealand becoming predator free, as to be successful, support and commitment is required throughout the country and across communities. Increasingly people around Aotearoa New Zealand are coming together to form local predator trapping programmes.

Individuals and community groups within Selwyn have enthusiastically joined the predator free movement and are actively trapping and monitoring mammalian pest species. Initiatives across the district include the creation of township Trap Libraries, and initiatives run by Ellesmere Sustainable Agriculture Incorporated, Craigieburn Trapping Alliance, Arthurs Pass Wildlife Trust and Kirwee Trappers, and include agency support for backyard trapping. On a larger scale, the Pest Free Banks Peninsula (PFBP) project gained significant funding through Pest Free 2050 Limited. Selwyn District Council and 14 other signatories signed a memorandum of understanding in 2018 to formalise this community led initiative to make Banks Peninsula (including Kaitorete) pest free. PFBP are working closely with Te Taumutu Rūnanga and the communities at Taumutu to remove predators, including feral cats, from the area adjacent to the Te Waihora lake opening site. The aim of this work is to create a pest free buffer zone that will reduce the potential of predator reinvasion onto Kaitorete when the lake is closed.

As time of the writing of this strategy discussions are being had towards a Pest Free Waitaha Canterbury, which includes the Selwyn District, with the key aim to establish an overarching landscape scale pest elimination project.

Dave Tilson, trapper extraordinaire. Photo John Williamson.

Rat eating a birds egg.

Stoat (Mustela erminea).

Common wasp (Vespula vulgaris).

3.3.2. Animal and Plant Pests

Pest animals

Many indigenous species are threatened by an array of predators and browsers that have been introduced to Aotearoa New Zealand, including possums, stoats, ferrets, weasels, rats, mice, cats, hedgehogs, pigs, rabbits, hares, deer, goats, wallabies, and invasive introduced fish.

Introduced insects can devastate natural and agricultural environments, and as per mammalian pests, they frequently lack natural predators. Invasive insects such as wasps *(Vespula spp.)* and Argentine ants *(Linepithema humile)* compete with other insects, birds and lizards for food and kill native invertebrates. Wasps have been documented killing newly hatched chicks.

The Government announced in 2016 that it had adopted the goal of making New Zealand predator-free by 2050. Predator Free 2050 Limited was formed as a Crown-owned, charitable corporation to assist the New Zealand government in meeting its ambitious goal of eradicating possums, stoats, and rats by 2050. The Entity provides co-funding to enable large-scale predator control and eradication projects, as well as the breakthroughs in science required to underpin them.

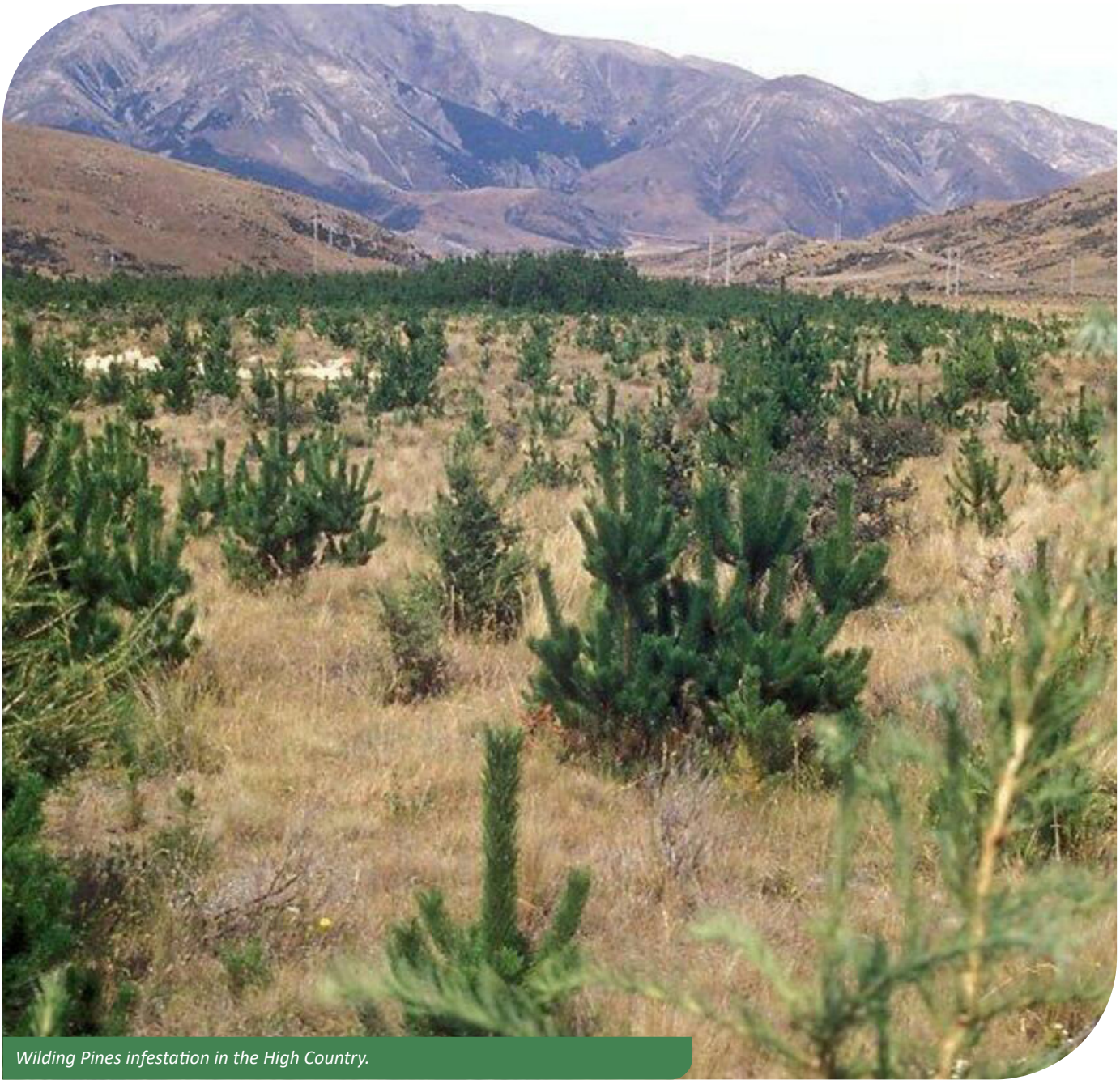
On 12 May 2021 the Council adopted a new bylaw for keeping certain domesticated animals (excluding dogs), poultry and bees in urban areas of Selwyn - Bylaw for Keeping of Animals, Poultry and Bees, July 2021. As part of the bylaw every person must ensure that their cats over four months of age are microchipped and registered with the New Zealand Companion Animals Register or another approved microchip registry. This part of the Bylaw came in to force on 1 July 2022 with the aim to promote responsible cat ownership and delineating between owned and stray or feral cats.

Pest plants and pathogens

By outcompeting native species and quickly filling niches, invasive plants, and algae (including didymo) can have profound consequences for native ecosystems. Invasive microorganisms can also pose a significant biosecurity concern, with Kauri dieback and myrtle rust being two recent examples in Aotearoa New Zealand, both of which are having widespread and devastating effects on iconic flora and the ecosystems they support.

Selwyn's montane and sub alpine environments are highly vulnerable to modification from fast growing wilding conifers. Wilding conifers spread through natural regeneration and shade out low-stature native plants, drying out wetlands and riparian areas, resulting in habitat loss for native flora. Soil and soil fauna are also altered when wilding conifers replace native ecosystems. The Canterbury Regional Pest Management Plan 2018-2038 classifies wilding conifers as pests, and community-led efforts, such as those carried out by the Waimakariri Ecological and Landscape Restoration Alliance (WELRA), have been addressing the wilding conifer problem in the Craigieburn area, Castle Hill Basin, the Torlesse Range, and surrounding areas. Having suitable funding to control wilding conifer spread is a significant issue. It is anticipated that carbon farming initiatives may pose a threat to indigenous biodiversity, including through the increased spread of weeds, and by removing native flora from 'marginal land' (in the planting process) that is reverting to indigenous species.

Other key weed species include grey willow, hawthorn, briar, sycamore, blackberry, cotoneaster, and holly. Many of these species are homestead and urban garden escapees and pose a threat to indigenous biodiversity within wetlands, river margins, shrublands and forests. Transport corridors (road and rail) are also corridors for weed spred. It is imperative that weed control is done taking a focused and organised catchment approaches with all the parties involved.



Wilding Pines infestation in the High Country.

Key point - many people in the Selwyn community are actively involved in ecological restoration through weed and animal pest control. Council, along with iwi, landowners/managers, the community, and other agencies (including Environment Canterbury, Land Information NZ, and Department of Conservation, are involved in several large scale weed control programmes, including at Tārerekautuku Yarrs Lagoon, within the Rakaia Gorge and in the upper Waimakariri Basin. Large scale restoration work requires the skill and knowledge of professionals and a significant commitment of time and investment.

3.3.3. Pollution

Pollution has a significant impact on native biodiversity, including through excess nutrients, sediment, and plastic waste.

Excessive leaching of nutrients into waterways and estuaries can cause them to become hyper-fertile which fuels infestations of exotic waterweeds and algal blooms that reduce oxygen levels in the waterbodies. This lack of oxygen can kill native fish and invertebrate species which are then replaced by those species tolerant of degraded habitats (including invasive weeds and introduced snails and fish).

Land Air Water Aotearoa (LAWA) monitor several water quality indicators (including E. coli, Nitrogen, and macroinvertebrates) in several locations in Selwyn. One site is on the upper reaches of the Waikirikiri Selwyn River at Whitecliffs. Long term data (10 years) show a downward trend of the MCI (Macroinvertebrate Community Index) indicating a decline in water quality. The MCI state shows a benthic community indicative of moderate organic pollution or nutrient enrichment.

Another site monitored by LAWA is in the lower reaches of the Waikirikiri Selwyn River at Coes Ford. The surrounding area is dominated by pastoral farming. For this site the MCI is similar to what has been recorded at Whitecliffs – a downward trend.

	State	*Trend*
Total Nitrogen	In the best 50% of all sites	Very likely degrading
Total Oxidised Nitrogen	In the worst of 50% of all sites	Very likely degrading
Dissolved Nitrogen	In the worst of 50% of all sites	Very likely degrading

Table 2: LAWA data recorded at Coes Ford on the lower reaches of the Waikirikiri Selwyn River. LAWA website 16/06/2023[1]

	State	*Trend*
Total Nitrogen	In the worst 25% of all sites	Very likely degrading
Total Oxidised Nitrogen	In the worst of 25% of all sites	Very likely degrading
Dissolved Nitrogen	In the worst of 25% of all sites	Very likely degrading

Table 3: LAWA data recorded at Whitecliffs on the upper reaches of the Waikirikiri Selwyn River. LAWA website 16/06/2023[1]

Both sites have experienced toxic algae blooms. During the summer months potentially toxic cyanobacteria can be present which pose a threat to human and animal health.

Water quality in urban areas is affected by heavy metal runoff such as copper and zinc from vehicle wear and tear. These contaminants can be toxic to aquatic life and are difficult to remove from the water.

Te Waihora Lake Ellesmere is one of Aotearoa New Zealand's most polluted lakes and contains some of the country's highest concentrations of sediment, nitrogen, and phosphorus in its water. The lake collects nutrients and sediments that come off the intensively farmed land and township activities in its catchments. This contamination can poison or smother aquatic plants and creatures, while the super-enrichment of nutrients such as nitrogen and phosphorous triggers algal blooms, that can be toxic.

Nitrogen enters the lake from surrounding land uses and activities, including those high in the catchment. An estimated 3,200 tonnes of nitrogen loss reach the lake each year, and because nitrogen travels slowly through the aquifers, its full impact can be delayed by decades. Phosphorus and sediment contamination continues partly as a result of past deforestation. Because phosphorus attaches to soil particles, each storm brings more, running off the land into drains, streams, and rivers. Due to the almost constant wind driven wave action on the lake the frequent re-suspension of bottom sediments has a significant effect on the benthic ecology of Te Waihora.

Selwyn's high-country lakes are also vulnerable to agricultural run-off. Excess nitrogen and phosphorus are carried into the lakes and their tributary streams by surface water run-off. The water quality of the lakes is being monitored by the Canterbury Regional Council, and if it is found to be deteriorating then solutions will need to be considered and actioned.

[1] *LAWA website Land, Air, Water Aotearoa (LAWA) - The homepage 16/06/2023*

Flooding of 2013, Te Waihora Lake Ellesmere in background.

3.3.4. Biodiversity and Climate Change

Climate change has the potential to have an impact on all natural ecosystems in Selwyn, and it is expected that the impacts of climate change, including extreme weather events, will put increasing pressure on Selwyn's biodiversity. This includes our freshwater environments, where, in addition to warmer air temperatures, water temperatures in our rivers, lakes, estuaries, and wetlands will rise, potentially affecting a variety of species as well as nutrient recycling. Existing pressures such as habitat fragmentation and pest effects will likely be exacerbated, and the ranges of some animal and plant pests may expand as a result of a warming climate, forcing vulnerable native species into reduced areas of safe and suitable habitat. Species living in our alpine ecosystems, for example, such as lizards and insects, have adapted to survive in freezing temperatures. As temperatures rise, snowlines will move upslope, forcing animals living in these environments to move also, potentially causing a habitat 'squeeze' in alpine ecosystems.

Many of the characteristics that make invasive species problematic (for example, increased reproduction or dispersal) may also make them more resilient to climate change than native species. Invasive insects and plants that may have been unable to survive winter conditions could persist and flourish in warmer conditions.

There are numerous well-known examples of how climate change will impact species that are endemic to Aotearoa New Zealand. Global warming may pose challenges for species with temperature-dependent sex determination, including tuatara.

Forest mast events (years with unusually high seed production) are highly responsive to temperature, and therefore mast events may become more frequent, causing rat and mice populations to explode. They then turn to other food sources like invertebrates, lizards, birds, and bird eggs.

The policies that the Selwyn district develops to respond to climate change will have clear implications for biodiversity. Some effects of climate change are sudden and difficult to predict like wildfires or extensive flooding events[15]. As such an absence of appropriate policy planning risks loss of biodiversity from natural areas in the Selwyn district.

Nature based mitigations such as wetland restoration will have an important role to play in building resilience to climate change. Conversely, mitigating the effects of climate change will depend on the ability of districts such as Selwyn to reduce CO2 emissions. Planning this energy transition will have benefits for biodiversity but may have other benefits including to revenue streams and community resilience.

Suitable strategic planning for renewable energy projects is important, and the future placement of key infrastructure, for example solar panels, should avoid any possible negative effects on indigenous biodiversity that is present at any proposed sites.

[15] *As citied Macinnis-Ng, C., Ziedins, I., Ajmal, H., Baisden, T. W., Hendy, S., McDonald, A.,& Godsoe, W. (2023). Climate change impacts on Aotearoa New Zealand: a horizon scan*

Liffey Springs in Lincoln. The beginning of the Arariria LII River.

3.4. Urban Biodiversity

Over the last decade, Selwyn has been one of Aotearoa New Zealand's fastest growing districts, growing from 46,700 people in 2013 to around 83,780 people in 2023. This represents an annual growth rate of about 6%, compared to the national average of 2%, and is expected to continue, with the current population expected to nearly double to over 150,000 by 2053.

Population growth drives urban expansion, and Selwyn, like the rest of Aotearoa New Zealand, is becoming more urban, with townships growing in area and accounting for nearly 90% of total population growth. As a result, Selwyn's urban population has increased to approximately 60% of the total population, compared to 43% ten years ago. Because land developed for urban use differs greatly from its natural state, urbanisation has a significant impact on land productivity and the ability to support biodiversity. Some of the ways that land use intensification, urbanisation, and associated infrastructure networks may contribute to biodiversity loss include:

- Habitat degradation, fragmentation, or loss
- Source of pollutants (home heating, transport, industry, wastewater, household, and personal rubbish)
- Modified land cover and increased run-off (sedimentation and pollution of waterways
- Invasive plant species (garden escapees)
- Urban pests (domestic dogs and cats)
- Indirect effects (climate change, increasing demand for resources).

Urban areas are effectively synonymous with ecosystem disruption and biodiversity loss. Indigenous land cover is typically reduced to less than 2% in urban centres and the fringes of urban areas are increasingly being subdivided and fragmented into smaller land parcels.

Despite having a low representation of indigenous land cover, urban areas play an important role in biodiversity conservation. Referred to as 'ecosystem services', many of the reasons for protecting biodiversity in urban areas (and their fringes) are highly utilitarian. Associated benefits include noise buffering, shade, heat reduction, air pollution control, carbon dioxide absorption, stormwater filtration and watershed protection. There has been a significant shift in thinking in recent years to consider urban development and the environment more holistically and to seek more sustainable solutions to infrastructure problems. Using a 'blue-green' or 'nature based' approach to reintegrate natural systems and processes into our urban environments has resulted in improved environmental outcomes, as well as aiding in increasing resilience and mitigating the severe impacts of climate change.

In addition to utilitarian considerations, preserving biodiversity is also important for aesthetic reasons, and urban areas often have a relatively high representation of green space and established tree planting. In addition to offering opportunities for relaxation and recreation, these areas serve as habitat for a variety of plant and animal species, bridging the disconnect between humans and nature while contributing to cultural wellbeing and health benefits, such as improved mental wellbeing and stress reduction.

From the perspective of landscape ecology, urban ecological networks may provide the only opportunity for corridors, connectivity, and wildlife movement across fragmented landscapes. For example, forming an important ecological network between nearby habitats like Banks Peninsula and the wider Canterbury Plains. Even native grass and shrub patches, such as green roofs and rock gardens, can provide important habitat and 'stepping-stones' for lizards and insects.

Despite the numerous recognised benefits, there is still a tendency for urban and township planning to promote, and often prioritise, the planting of exotic species in residential land developments, often for aesthetic or functional reasons. In some cases, this may be a missed opportunity to increase indigenous vegetation coverage, and mana whenua has identified it as a major concern, particularly where exotic species are used along waterways, in reserves, and in other public spaces. Planting requires careful consideration, as urban centres in particular, often support only species that are particularly well adapted to human impact, and tolerance of extreme temperatures and drought, and that necessitate continuous hands-on management.

There are, however, numerous opportunities and creative ways to increase indigenous biodiversity within urban environments, such as incorporating eco-sourced native vegetation into public spaces and encouraging residents to do the same with their private gardens. Positively, there is evidence of a gradual shift in people's appreciation of and preferences for the use of indigenous trees and shrubs within amenity plantings.

People appear to have a growing affinity for what is uniquely Aotearoa New Zealand, particularly among younger generations.

Urban areas also have the potential benefit of a large volunteer base for community-led conservation actions such as planting, weed control and backyard predator trapping. Several townships within Selwyn have established backyard trapping programs.

The National Policy Statement for Indigenous Biodiversity 2023 (NPS-IB) has a strong focus on urban development and urban biodiversity. The NPS-IB works alongside the National Policy Statement on Urban Development 2020 to support the development of well-functioning, healthy urban environments. Under the NPS-IB, Council is required to balance several requirements alongside urban intensification. This includes maintaining at least 10% indigenous vegetation coverage within urban areas by offsetting anticipated losses, as well as preserving and promoting connectivity between and buffering around existing and potential habitats and ecosystems.

Community planting day.

Mahoe Reserve in Lincoln.

Key point - Lincoln's Mahoe Reserve is an excellent example of a community-led ecological restoration project. Year 9 students from nearby Lincoln High School initiated the project in 2002. Planting began in 2003, and since then, over 7,000 native trees, shrubs, and grasses have been planted by dedicated community members, including schools, kindergartens, and other local groups. The Mahoe Management Committee, comprised of members from the local community, manages the Reserve, which is overseen by the Lincoln Envirotown Trust.

Case Study

Te Waihora Lake Ellesmere. Photo by Steve Attwood.

Te Waihora Lake Ellesmere

Ngāi Te Ruahikihiki ki Taumutu are the primary kaitiaki guardians of the Te Waihora catchment. Many generations ago, Te Rakihouia discovered the great coastal lake he described as 'flat spread-out water' – or Te Waihora. Te Rakihouia claimed the abundant resources of the area for his father Rākaihautū and gave the lake its original name Te Kete Ika a Rākaihautū The Fish Basket of Rākaihautū.

"Rangatiratanga, 'has to be expressed by us, ... a leadership role in looking at how we can use the lake, what we can do on it, what sort of role we can play... that we know the expectations, and that we need to be recognised that we do have the knowledge and that's the importance of rangatiratanga.'"
Cath Brown (Mahere Tukutahi o Te Waihora, 2005).

Te Waihora is a tribal taoka. It was once bounded by extensive wetlands of raupō, harakeke (flax) and kuta (sedges) – of which over 80% have been lost or extensively modified. These would have given way to forests of kahikatea, red beech, mataī, and tōtara which would have extended to present-day Ōtautahi Christchurch. Extensive canopies of floating weed beds also provided habitat, food, and trapped sediment, creating clear freshwater zones. The extensive and diverse wetlands were valued as part of a wider mahika kai resource.

The swampy environs of the lake, including Waiwhio River, Waitātari Harts Creek and Waikēkēwai Creek provided the prime environment for tuna eels, pātiki flounder, kanakana lamprey and waterfowl such as pūtakitaki paradise duck, a bounty which provided for those living at Taumutu. Since the mid-nineteenth century, management of the lake and its catchments has reflected farming and settlement values, at the expense of mana whenua values. Riparian margins associated with waterways such as the Waikirikiri Selwyn River and Waiwhio Irwell River and Tārerekautuku Yarrs Lagoon were also important parts of the Te Waihora mahika kai network.

Covering 20,000 hectares Te Waihora is a storehouse for wetland biodiversity and has some of the most important wetland and wildlife habitat of its type in Aotearoa New Zealand. The outstanding values of the lake are recognised in the 1990 National Water Conservation Order over Te Waihora.

Locally and internationally, Te Waihora is significant for its abundance and diversity of birdlife. 166 species of birds have been recorded here, including 133 indigenous species. Approximately 80 species are regular inhabitants of the lake and its margins with others being migrants and infrequent visitors.

There are 33 species of indigenous and five non-indigenous species of fish in the lake and it also provides habitats for a wide diversity of plant and invertebrate species.

There are approximately 80 species of birds that are regular inhabitants of the lake and its margins - with many more species migrants and infrequent visitors. While outside the Council's boundaries, Kaitorete is a significant cultural landscape associated with the Te Waihora catchment and supports its own unique indigenous biodiversity.

The lake is also currently used for a wide range of water and land-based activities. It has been identified as nationally significant for waterfowl hunting, and regionally significant for fishing and cycling on the rail trail.

In a 2010 report on lake water quality Te Waihora was deemed the second most polluted lake in Aotearoa New Zealand in terms of nutrient content and algal growth. As a result of the challenges that the lake faces there are numerous mana whenua, landowner, and agency partnership projects underway around its margins and catchments. Most of these projects focus on biodiversity protection and creation, and water quality improvements. Re-establishing a wetland margin around the lake as a buffer from land use is a key method for both restoring biodiversity opportunities and the cultural health of the lake.

In 2012 Te Rūnanga O Ngāi Tahu and Environment Canterbury signed the Te Waihora Co-Governance agreement. In 2014, Selwyn District Council joined, followed by Christchurch City Council in 2016 and the Department of Conservation Te Papa Atawhai in 2019.

(Report Verburg, P.; Hamill, K.; Unwin, M.; Abell, J. (August 2010). Lake water quality in New Zealand 2010: Status and trends (PDF). Hamilton: National Institute of Water & Atmospheric Research Ltd. Archived from the original (PDF) on 26 December 2010.)

4. Ngāi Tahu

Te Pā o Moki marae, Taumutu. Photo Allan Robertson.

4.1. Introduction

Tāne Mahuta is the atua of the forests and birds, and the son of Ranginui and Papatūānuku. It is Tāne that broke the tight embrace of his parents, forcing Ranginui high into the heavens and leaving Papatūānuku on earth to care for their children. Papatūānuku Mother Earth is profoundly important in mana whenua worldview, as the birthplace of all things of the world, and the place to which they return. Papatūānuku is the wife of Ranginui, and their children are the ancestors of all parts of nature.

Wai Māori freshwater is the significant cultural resource that connects mana whenua to the landscape and the culture and traditions.

Ko te wai te oraka o kā mea kātoa.
Water is the life giver of all things. Wai Māori, whether under the ground, on the surface or falling from the sky, is the resource that weaves together with Tāne Mahuta and Papatūānuku to support all indigenous biodiversity. Wai also includes other culturally important water sources and bodies including waipuna spring, hāpua lagoon; and the interaction with the coastal environment and the realm of Tangaroa, atua of the sea.

This chapter provides the context for indigenous biodiversity aspirations and desired outcomes for Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri, who hold rights over lands and waters across modern day Selwyn District. The ahi kā of Ngāi Te Ruahikihiki remains at Taumutu to this day and instils the primary responsibility of kaitiaki in this takiwā.

Within Selwyn District, the takiwā of Te Taumutu Rūnanga centres on Taumutu and the waters of Te Waihora and adjoining lands and shares a common interest with Ngāi Tūāhuriri Rūnanga and Te Rūnanga o Arowhenua in the area south to Hakatere Ashburton River.

The takiwā of Te Ngāi Tūāhuriri Rūnanga centres on Tuahiwi and extends from the Hurunui to Hakatere, sharing an interest with Arowhenua Rūnanga northwards to Rakaia, and thence inland to the main divide.

4.2. Partnership for Biodiversity Outcomes

The partnership between mana whenua and Council is key to improving biodiversity outcomes in Selwyn. Te Tiriti o Waitangi provides the basis for the relationship between government and mana whenua in managing indigenous biodiversity, as per the duty of active protection of Māori interests and the principle of partnership.

In implementing the Actions in this strategy – and to achieve the biodiversity outcomes sought by mana whenua – it is essential that the mātauraka knowledge held by Ngāi Te Ruahikihiki ki Taumutu and Te Ngāi Tūāhuriri to sustain specific cultural values is recognised and utilised equally alongside mainstream methods.

The Mahaanui Iwi Management Plan 2013 is the mana whenua planning document which reflects the collective efforts of kā papatipu rūnaka in the Mahaanui rohe. In this context, it applies as the guiding document to Te Taumutu Rūnanga and Ngāi Tūāhuriri Rūnanga to help shape measurably successful outcomes for mana whenua in this Strategy.

To underline the importance of partnership to mana whenua, Policy TM2.2 in the IMP states:

"To recognise Te Tiriti o Waitangi as the basis for the relationship between central and local government and tāngata whenua with regard to managing indigenous biodiversity, as per the duty of active protection of Māori interests and the principle of partnership."Policy TM2.3 emphasises the partnership at District level:

"To continue to work in partnership with the Department of Conservation, local authorities and the community to protect, enhance and restore indigenous biodiversity."

Restoring indigenous biodiversity values is one of the most important challenges for future management in the takiwā. A healthy economy relies on a healthy environment. Indigenous biodiversity, along with air, water, and soil, are taoka – they are the region's natural capital, providing a suite of essential ecosystem services.

This strategy reflects these obligations for the protection and enhancement of indigenous biodiversity in Selwyn. It explicitly recognises the relationship of mana whenua, specifically Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri, to biodiversity and the need for a partnership approach to achieve biodiversity outcomes. The specific goal in this strategy for mana whenua is:

GOAL 1 – Work in partnership with mana whenua, who hold rights over lands and waters within the district, to protect, enhance, maintain, and restore indigenous biodiversity whilst recognising the importance of mahika kai, taoka species, and culturally significant sites.

The partnership will help achieve successful outcomes as this goal is supported by targets and actions. Actions will be implemented by stakeholders with appropriate funding and within workable timeframes.

4.3. Mahaanui Iwi Management Plan

The Mahaanui Iwi Management Plan (IMP) was informed by the work of Tau et al (1992) and Te Taumutu Rūnanga (2003), in themselves taoka, the latter especially tabulating mahika kai and taoka species. The IMP is an expression of kaitiakitaka and rakatirataka. It provides a values-based, plain language policy framework for the protection and enhancement of mana whenua values, and for achieving outcomes that provide for the relationship of mana whenua with natural resources.

The IMP presents a series of general policy statements (IMP 1.1 – 1.8), providing a framework for expressing the outcomes, expectations and opportunities associated with implementing the IMP. In particular, Policy IMP1.7 states:

"To work with local government and other agencies to realise the full potential and value of (the) IMP across planning and decision-making processes, including giving effect to the plan over and above existing statutory requirements."

Of primary importance to realising the aspirations in this mana whenua chapter for indigenous biodiversity are those Issues and Policies within Section 5.5 (Tāne Mahuta) of the IMP.

Mahaanui Iwi Management Plan Issue	IMP Policies
Loss of mahika kai areas and opportunities in the takiwā (TM1)	TM 1.1 – 1.8
The widespread loss of indigenous biodiversity (TM2)	TM 2.1 – 2.11
The restoration of indigenous biodiversity (TM3)	TM 3.1 – 3.6
Weed and pest control for protection and restoration of indigenous biodiversity (TM4)	TM 4.1 – 4.4

Table 4: IMP General Indigenous Biodiversity Issues and Policies

Under current national direction for resource management, the IMP is 'taken into account' by Council planning documents. To help prevent further degradation and loss of indigenous biodiversity, this strategy needs to have elevated status; and 'give effect to' the IMP.

Specific Policies

To underline the importance of indigenous biodiversity to mana whenua, the table below identifies more specific catchment issues (cross-referenced) and policies in Section 6 of the IMP. These include:

Specific IMP Issues, Policies **(bold)** and Issue cross-references *(italics)*
WM13 Loss of wetlands, waipuna and riparian margins, and the cultural and environmental values associated with them. **Wai Māori WM13.1, 13.2**. *TW6 - Mahika Kai*
WM14 Drain management can have effects on mana whenua values, particularly mahika kai. **Wai Māori WM14.1, 14.2**
TAN3 Protecting the ecological and cultural values of coastal wetlands, estuaries and hāpua. **Tangaroa TAN3.1. WM13** – *Wetlands, Waipuna and Riparian Margins*
TW6 Loss of mahika kai resources and opportunities in Te Waihora and its catchment. **Te Waihora TW6.3**. **WM13** – *Wetlands, Waipuna and Riparian Margins*
TW8 Degradation and loss of wetlands, waipuna and riparian margins and associated mana whenua values. **Te Waihora TW8.1, 8.2. WM13** – *Wetlands, Waipuna and Riparian Margins; TAN3 – Coastal Wetlands, Estuaries and Hāpua*
TW11 Protecting Ngāi Tahu values associated with Kaitōrete Spit including indigenous biodiversity, particularly pīngao. **Te Waihora TW11.3**
WAI8 Protection of high-country lakes and associated values from land use. **Waimakariri WAI8.1. WM13** – *Wetlands, Waipuna and Riparian Margins*
RH6 Recognising the cultural association of Ngāi Tahu with high country lakes, tarns and wetlands. **Rakaia Ki Hakatere RH6.1, 6.3.** *RH8 – Indigenous Biodiversity Values*
RH8 Protecting and enhancing indigenous biodiversity values in the catchment. **Rakaia Ki Hakatere RH8.1.** *RH6 – High Country Lakes and Wetlands; TM2 - Indigenous Biodiversity; TM3 – Restoration of Indigenous Biodiversity; TM4 – Weed and Pest Control*
P12 Effects on biodiversity by vegetation burning/clearance. **Papatūānuku P12.2.** *TM2 - Indigenous Biodiversity*
P14 Effects on biodiversity by commercial forestry. **Papatūānuku P14.6**

Table 5: Specific IMP Issues and Policies

The ability of the Mahaanui IMP to reach its full potential is dependent on the commitment to partnership between mana whenua, Council, agencies, and landowners to the kaupapa, to realise the value of the IMP to meet kaitiakitaka objectives.

4.4. Issues of Significance

This section addresses issues of significance pertaining to the flora and fauna that make up the domain of Tāne. Mana whenua have a particular interest in indigenous biodiversity, for its inherent value on the landscape and the ecosystem services it provides, and with regard to mahika kai.

Indigenous flora and fauna have sustained mana whenua for hundreds of years, providing food, fibre, building materials, fuel, medicine, and other necessities. The relationship between mana whenua and indigenous biodiversity has evolved over centuries of close interaction and is an important part of Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri culture and identity.

The Canterbury Plains, high country and alpine areas within Selwyn have experienced significant land use change and resultant habitat and indigenous biodiversity (and taoka species) loss since the mid-nineteenth century. The key issues and challenges for indigenous biodiversity today, from a mana whenua perspective, are its widespread loss, its restoration, and the control of weeds and pests.

Climate change impacts, intensive rural land use, subdivision, infrastructure development (for example, roading/highway network), earthworks and gravel extraction are also having significant direct or indirect effects, causing the loss or degradation of indigenous biodiversity.

Harakeke NZ Flax (Phormium tenax).

4.4.1. Loss of Indigenous Biodiversity

The widespread loss of indigenous biodiversity has significant effects on:

- the relationship of mana whenua (culture and traditions) with ancestral lands, water and sites;
- mahika kai values; and
- the health of land, water, and communities.

Following European settlement, the drainage of swamps and wetlands, the felling of bush, the conversion of land to agricultural use, and the introduction of acclimatised flora and fauna, had a devastating effect on the mahika kai resources and sites, which had been relatively undisturbed for centuries prior.

The physical loss of land and access to these sites had an equally devastating effect on the ability of mana whenua to provide for their own sustenance. This strategy allows mana whenua to utilise mātauraka techniques to:

- protect, enhance, and extend what biodiversity 'remnants' exist; and
- reinstate new plantings (where ecologically possible) to restore the loss of indigenous biodiversity.

Matters of importance

The following can be addressed through mana whenua and Council partnership:

Mana whenua interest in biodiversity: it is important to identify and map special features of indigenous biodiversity (specific areas or species) that have significant cultural heritage value. The incorporation of mātauraka values and concepts held by Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri will play a key role in future biodiversity management.

Significance: appropriate criteria help assess the significance of ecosystems and areas of indigenous biodiversity that are significant for cultural reasons. Protection of remnant and restored areas: showcasing existing remnant and restored areas as examples of how future management can improve the cultural health of the takiwā is vital.

Integrating indigenous biodiversity into the landscape: Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri support the planting of indigenous species as a requirement for discharge permits or resource consents. It is therefore important to require indigenous species to be incorporated wherever and whenever possible in places such as shelter belts on farms, the provision of buffers around industrial sites, and the creation of indigenous riparian margins along waterways.

A major concern for mana whenua is that urban and township planning has tended to promote, and often prioritise, the planting of exotic species in residential land developments, along waterways and in reserves and open space. Mana whenua want indigenous species to be prioritised ahead of exotic species for planting projects.

Biodiversity corridors: establishing new biodiversity corridors in the district 'from the mountains to the sea' - Ki Uta Ki Tai - as means of connecting areas and sites of high indigenous biodiversity value.

Ecosystem services: indigenous biodiversity also provides a variety of often unrecognised ecosystem services. These services include the retention of soil by catchment vegetation, wetland sediment trapping, and nutrient filtering by riparian and wetland vegetation to improve downstream water quality.

A comprehensive list of taoka species in the shared takiwā is tabulated in the appendix.

4.4.2. Biodiversity Restoration

The **restoration of indigenous biodiversity** is critical to achieving mana whenua objectives to increase the abundance, access to, and use of mahika kai.

Oral tradition and tribal and historical records provide a reliable and accurate source of information to construct a picture of the pre-European settlement landscape and the species that existed in this environment. Regrettably, there are examples of flora and fauna, once abundant in the shared takiwā, which are now either under great threat of extinction or are already extinct.

Craig Pauling participating in mātauraka Māori monitoring.

The importance of indigenous biodiversity to mahika kai is reflected in mana whenua perspectives on restoration: that restoration is about restoring the mauri of land and places, and about restoring the relationship of Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri to these places. Combined, mana whenua have and offer a unique and tested set of tools, practices and knowledge that has already provided a valuable basis for restoration projects.

Mana whenua wish to utilise mātauraka Ngāi Te Ruahikihiki ki Taumutu and mātauraka Ngāi Tūāhuriri wherever possible. For example, to support the use of natural succession and staged underplanting of natives into wetland and lagoon areas.

4.4.3. Mahika Kai

Mahika kai is central to mana whenua culture, identity and relationship with the landscapes and waterways of the Selwyn District. The Taiaroa 1880 Mahika Kai Maps (see below) demonstrate how extensive mahika kai sites once were in Waikirikiri Selwyn.

The Ngāi Tahu Settlement Claims Act 1998 describes mahika kai as "the customary gathering of food and natural materials and the places where those resources are gathered". Customary use is the ongoing access to, and sustainable use of mahika kai resources and tauraka ika fishing grounds.

"…. The better eels were from Muriwai and the whitebait at Coopers Lagoon. When we used to go whitebaiting, we would drive the horse and cart down to the beach to Coopers Lagoon and go white baiting there, because the Lake wouldn't be open at Lake Ellesmere. If the Lake was open, you could stand in our kitchen and look down at the Lake opening… if the seagulls were dipping you knew to run your net down to the Lake, catch a feed, run home again and they would still be alive".

Aunty Ake Johnson (Te Whakatau Kaupapa, 1990)

Tuna at Liffey Springs Lincoln.

Extract from the Taiaroa 1880 Mahika Kai Maps, showing mahika kai sites in the Rakaia and Te Waihora areas.

Ki Uta Ki Tai: The principle of ki uta ki tai is critical as a culturally appropriate approach to mahika kai enhancement, restoration, and management. It includes management of whole ecosystems and landscapes, in addition to single species; and the establishment, protection and enhancement of biodiversity corridors to connect species and habitats.

Mahika kai habitat: Mana whenua continue to advocate for the protection of indigenous fish species over and above the protection of habitat for salmon and trout. The protection of significant habitats of indigenous fauna is a matter of national importance under the RMA (s.6).

Remnant areas: Regulatory documents should, as a matter of course, include policy and rules to protect, enhance and extend existing remnant wetlands, waipuna, riparian margins and native forest remnants in the takiwā given the importance of these ecosystems as mahika kai habitat.

Additionally, landowners and commercial land users should be required (if seeking a land use consent), or otherwise encouraged, to protect remnant areas of indigenous biodiversity on their properties.

4.4.4. Weeds and Pests

Weed and pest eradication within the Selwyn District, including on private and conservation land, is critical to the protection and restoration of indigenous biodiversity. Mana whenua biodiversity objectives emphasise the protection of existing values and the enhancement and restoration of those that are degraded.

Weed and pest invasions can significantly compromise restoration efforts. Key concerns are the invasion of braided riverbeds by gorse and broom, the spread of willow along waterways, russell lupins along rural roads, wilding trees, and the effects of possums on native forests. Pest plants may invade an area following ground disturbance.

Mana whenua will utilise mātauraka Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri to support private landowners and conservation groups that are undertaking weed and pest control programmes. Of particular mana whenua interest is the eradication of weeds, and the transition to replanting of indigenous species, in the coastal environment.

The effective control of russell lupins is also important to mana whenua as this lupin is a particularly aggressive weed, especially in braided waterways where it will leave little clear gravel, thus compromising the habitat of nesting birds.
It is worth noting that some introduced species do retain cultural value for mana whenua, for example, wild pigs and watercress.

4.4.5. Vegetation Clearance and Exotic Forestry

A cultural issue associated with vegetation clearance is that the clearing of 'scrub' for pasture often includes indigenous species. This includes kānuka and mānuka which are good nursery species for other indigenous species. Vegetation clearance also occurs as part of subdivision and residential land development activities.

Mana whenua are also concerned about the effects of exotic forestry on indigenous biodiversity in some areas of the takiwā. If not managed appropriately, plantation forestry can result in soil erosion, sediments and contaminants entering waterways, and the establishment and spread of wilding trees.

Buffers and set back areas are important to maintain sufficient distance between and for the protection of remnant indigenous forest areas (efor example, in alpine gullies and around alpine lakes), and these must be recognised during forestry planting and harvesting.

4.5. Taoka Flora Fauna and Ecosystems

Mana whenua have a longstanding relationship with indigenous flora and fauna, one that includes rights to access, conserve, use and protect native species. The Treaty of Waitangi requires the active protection of the kaitiaki relationship of mana whenua with indigenous flora and fauna.

Taoka species in the IMP refer to species of flora and fauna that are significant to the culture and identity of mana whenua. Because there is a body of inherited knowledge relating to them, they are related to the iwi or hapū by whakapapa; and the iwi or hapū are obliged to act as their kaitiaki.

The protection of taoka species and mātauraka Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri from (for example) inappropriate commercial use and development, is also critical to the protection of Ngāi Te Ruahikihiki ki Taumutu and Ngāi Tūāhuriri culture and identity.

White Heron Kōtuku (Ardea alba). Photo by Steve Attwood.

One of the most significant concerns for mana whenua is that the clearing of 'scrub' for pasture often includes indigenous species such as kānuka, mānuka and pātōtara (mingimingi), all of which are taoka species[17]. It is even more concerning when vegetation is cleared in gullies and along waterway margins. Clearance of vegetation can result in small and disconnected fragments of native bush; and this can have important implications for the regeneration of podocarps in the takiwā.

4.5.1. Mountain and Foothills

High country lakes and wetlands are significant features of the relationship of mana whenua with the high country. Lakes were important sites on the high-country trails, providing an abundance of food and other resources. Wetlands and tarns were also important features of this relationship.

Many vegetation types are present in mountain and foothill landscapes, influenced by altitude, temperature, and precipitation, and historical land use patterns. They include alpine and sub-alpine herb fields, tussock grasslands, scrub, and occasional stands of indigenous bush. Indigenous plants such as toe toe, tussock grasses, and tikumu mountain daisy are important mahika kai for Ngāi Te Ruahikihiki ki Taumutu.

Whakamatau Lake Coleridge was used by mana whenua up until the middle part of the 19th century, with the principal mahika kai resources being tuna, pūtakitaki, pārera, pāteke, whio, pūkeko, kāuru, aruhe and weka.

There are more than twelve lakes and associated wetlands in the Waimakariri catchment including Moana Rua Lake Pearson, Waikawa Lake Lyndon, and Ōporea Lake Hawdon. These lakes were important mahika kai sites associated with the network of high-country trails used by mana whenua, and they were also used to provide coastal communities with resources.

Mana whenua biodiversity objectives emphasise the protection of existing values and the enhancement and restoration of those that are degraded. Appropriate management and monitoring of high-country land use and weed and pest control on private and conservation land, is fundamental to achieving these objectives.

"You can't tell a fish what the difference is between a drain, river, stream or spring."

David Perenara O'Connell *(IMP, 2013)*

A series of intact tarns and wetlands at Lake Hawdon.

4.5.2. Wetlands, Waipuna and Riparian Margins

Wetlands, waipuna and riparian margins are taoka to mana whenua, providing rich sources of mahika kai, and are treasured for their natural ecosystem functions that are fundamental to the cultural health and mauri of freshwater resources.

Wetlands and riparian margins associated with waterways such as the Waikirikiri Selwyn River were once important for the harvest of cultural resources such as harakeke but have since suffered a profound loss of these values.

Te Waihora and smaller wetlands such as Muriwai have strong mahika kai traditions. However, most of the original wetland area has been drained for settlement and agriculture, with remnant wetlands mostly remaining as narrow lake fringes.

Planting riparian margins along all waterways and drains (on both public and private land) is essential to restore habitat, filter run off, provide shade, and reduce sediment entering waterways.

[17] Under Schedule 97 of the Ngāi Tahu Claims Settlement Act 1998.

4.5.3. Coastal and Marine Environment

The coastal boundary of the Ngāi Te Ruahikihiki ki Taumutu takiwā extends along the eastern coast from Te Pātaka-o-Rākaihautū Banks Peninsula and shores of Te Waihora along the coastline south to the Hakatere.

The coastal regions of Ngāi Te Ruahikihiki ki Taumutu support a diverse range of fish, plants, waterfowl, and other wildlife. Te Waihora and the nearby Muriwai hāpua coastal lagoon both support large numbers of bird and fish species within their unique environments.

The transition zone between land and sea provide habitat for many species not found in other areas. The coastal dune ecosystems of Kaitorete Spit support the pīngao, an endemic sand-binding and dune-building coastal plant.

4.6. Te Waihora

Ngāi Te Ruahikihiki ki Taumutu are the primary kaitiaki guardians of the Te Waihora catchment. Many generations ago, Te Rakihouia discovered the great coastal lake he described as 'flat spread-out water' – or *Te Waihora*. Te Rakihouia claimed the abundant resources of the area for his father Rākaihautū and gave the lake its original name *Te Kete Ika a Rākaihautū* The Fish Basket of Rākaihautū.

"Rangatiratanga, 'has to be expressed by us, ... a leadership role in looking at how we can use the lake, what we can do on it, what sort of role we can play... that we know the expectations, and that we need to be recognised that we do have the knowledge and that's the importance of rangatiratanga."

Cath Brown (*Mahere Tukutahi o Te Waihora, 2005)*

Pingao (Ficinia spiralis) on Kaitorete. Photo by Steve Attwood.

Key point - Pīngao *(Ficinia spiralisa)* is not found anywhere else in the world. It has now declined to the extent that it has disappeared from many areas of the motu. Increasing pressure from recreational use, grazing, fire, and introduced invasive plants has significantly reduced the Pīngao population.

Kaitorete is adjacent to the district's boundary. It is a significant cultural landscape associated with the Te Waihora catchment and contains the largest continuous remaining area of Pīngao in Aotearoa New Zealand, an endemic native sand binding sedge prized for weaving.

Coastal reclamation and sand minding have all contributed to the reduction of Pīngao in coastal dune environments.

Te Waihora is a tribal taoka. It was once surrounded by extensive and diverse wetlands that were valued as part of a wider mahika kai resource. Since the mid-nineteenth century, management of the lake and its catchment has reflected farming and settlement values, at the expense of mana whenua values. Wetlands and riparian margins associated with waterways such as the Waikirikiri Selwyn River and Waiwhio Irwell River were once important for the harvest of indigenous biodiversity resources for cultural reasons - such as harakeke - but have since suffered a profound loss of these values.

With most of the original wetland area drained for settlement and agriculture, only remnant wetlands remain as a narrow fringe around the lake, such as Te Waiomākua and Ahuriri. Re-establishing a wetland margin around the lake as a buffer from land use is a key method for both restoring biodiversity opportunities and the cultural health of the lake. Close to the current lake fringe, Tārerekautuku Yarrs Lagoon was also an important part of the Te Waihora mahika kai network.

Te Waihora is a storehouse for wetland biodiversity. The swampy environs of Te Waihora including Waiwhio, Waitātari Harts Creek and Waikēkēwai Creek provided the prime environment for tuna eels, pātiki flounder, kanakana lamprey and waterfowl such as pūtakitaki paradise duck, a bounty which provided for those living at Taumutu. It also provides habitats for a wide diversity of plant and invertebrate species. Many species are mahika kai that have sustained mana whenua customary use of the Te Waihora catchment (see listing in Appendix B).

The existing framework provides for a working relationship between mana whenua and regulatory entities[18]. There are several areas in which desired outcomes have not been achieved, for example, mana whenua who fish for pātiki and tuna from the lake are subject to rules about how they access the lakebed, rules which impede full access to mahika kai resources.

Summary:
The partnership between mana whenua and Council is key to improving biodiversity outcomes in Selwyn. The Mahaanui Iwi Management Plan provides the values and the policy framework for the protection and enhancement of mana whenua values, and for implementing actions to achieve outcomes that provide for the relationship of mana whenua with natural resources.

In implementing this strategy, it is essential that the mātauraka held by mana whenua to sustain specific cultural values is also recognised and incorporated.

Lagoon Saddle near Bealey Spur.

[18] Te Waihora Joint Management Plan (2005)

5. Kā Mahi Whakahaere
Opportunities For Better Biodiversity Management

Rakaia River gorge.

5.1. Leadership and Partnerships

Leadership:
Local authorities and agencies have statutory responsibilities to conserve and maintain indigenous biodiversity within their districts. Over time there have been variations in the extent to which agencies are meeting these responsibilities and showing leadership in biodiversity management, however, in recent years there has been increasing alignment and partnership between the agencies. Examples of this are key projects such as the Rakaia Gorge weed control project, and the information sharing Memorandum of Understanding signed in 2021 between Council and Land Information New Zealand.

Council places increasing levels of effort and significance on biodiversity management and recognises that the ongoing loss of indigenous biodiversity is a significant environmental issue. It takes proactive measures such as providing incentives, financial and technical support to landowners and community groups, and funds staff and resources for management, protection, and education initiatives. It is anticipated that increased focus may be needed on biodiversity monitoring and regulatory measures associated with compliance activities.

It is important that the most appropriate responses for biodiversity issues are identified, available and adopted. Relying solely on regulatory measures, without additional proactive approaches, can have a negative effect by creating disincentives for landowners to value and protect biodiversity. But when a solely voluntary approach is taken without proactive education, advocacy, and incentives, this can result in biodiversity losses and criticism of Council from parts of the community for not taking a more regulatory approach. Ideally a combination of measures, proactively implemented and monitored, are required for improved biodiversity outcomes to be achieved.

The success of any particular approach also depends on the application of good implementation practice involving key stakeholders (including landowners) from the outset, good relationship management, initially focussing on those who are willing, and taking a partnership approach. Ideally the optimal approach will reduce uncertainty for landowners and the community.

One important aspect of providing leadership for indigenous biodiversity is to demonstrate best practice in the work programmes on Council land.

It is important that Council leads by example by proactively managing its own land for the protection and maintenance of biodiversity values, and by identifying and taking up opportunities for restoration initiatives in both urban and rural spaces. This will enable Council to effectively promote and advocate for improved biodiversity awareness and outcomes elsewhere.

Leadership from the Selwyn community through non-government organisations, community groups, and trusts, as well as from individual community leaders is also important. Communities promoting and celebrating biodiversity success stories and sharing experiences that motivate, support, and inspire others, are fundamental.

Discussing management options at Tārerekautuku Yarrs Lagoon.

Partnerships:
There is a place for everyone in our community to be involved in biodiversity protection and management. By working together towards common goals, we can achieve much more than by working alone. Working together in partnerships towards a shared vision for biodiversity helps to ensure that our collective responsibilities are enacted.

Actions to address biodiversity loss and improve outcomes needs to include everyone involved in biodiversity across the district – iwi, community organisations, environmental NGOs, central and local government agencies, businesses, industry, landowners/managers, and individuals. We need to collaborate with each other to actively manage threats to biodiversity, and take proactive and positive measures to protect, manage and restore biodiversity. Diverse players with differing interests and values in biodiversity should work together to implement the vision and goals of the strategy.
Partnerships at all levels is a core approach for delivering this strategy and we all need to work together to make its vision a reality. With the formation of the Biodiversity Working Group a range of perspectives and expertise – including from iwi, agencies, industry, education providers wānaka, and our community – will help to plan and implement the next steps.

A good example of a key biodiversity partnership is the Upper Waimakariri Weeds Working Group which was established in 2020. This group – which is made up of landowners, the University of Canterbury, Environment Canterbury (ECan), Selwyn District Council, Land Information New Zealand (LINZ), the Department of Conservation, Kiwi Rail, Waka Kotahi, and community groups – has led the development of a weed control strategy for the area and is actively involved in leading projects to control and eliminate weeds that threaten biodiversity and key habitats in the upper Waimakariri basin. The enduring success of this project will be reliant on sourcing suitable funding and associated agency leadership.

5.2. Coordination and Integration

There are a range of organisations within Selwyn undertaking biodiversity related programmes and initiatives. In the past integration and co-ordination between them has often been lacking. This has resulted in inefficiencies and missed opportunities for sharing knowledge and experiences, for better alignment of effort and resources, shared biodiversity monitoring and protection, and for establishing partnerships. However, with leadership from Council biodiversity staff and other agencies such as ECan and LINZ this has improved greatly in recent years. Key partnership projects are being undertaken in places including the Rakaia Gorge, Te Waihora, Tārerekautuku wetland, Arthurs Pass, and the upper Waimakariri basin.

All local, regional, and central government agencies have differing functions which they are required to carry out in accordance with a range of legislation, the objectives of which can at times conflict with the biodiversity management roles that these agencies also have. A more coordinated and aligned approach should be taken, which will lead to a reduction in conflicting messages from and between agencies in relation to biodiversity management, resource use and development. As an example, in 2021 Council developed and signed a Memorandum of Understanding agreement with Land Information New Zealand to share information regarding consents for development on Crown Pastoral Lease land in the Selwyn High Country.

The long-term success of biodiversity management in Selwyn will reflect the cumulative efforts and impacts of activities by landowners, agencies and stakeholders in the district. Council biodiversity staff have developed extensive networks and working relationships with mana whenua, landowners, partners, and stakeholders throughout Selwyn. The value of these relationships to achieving successful biodiversity outcomes is crucial, and there is an ongoing need to build on these existing partnerships, reward and incentivise best practice, and proactively foster new relationships and tactics to address biodiversity issues. Council will continue to work proactively in partnership with stakeholders - including the QEII Trust, the Department of Conservation, Land Information New Zealand, Environment Canterbury, other agencies, private landowners, non-government organisations and the Selwyn community.

5.3. Attitudes, Awareness, and Incentives

The protection of biodiversity on private land can be perceived by landowners as an economic liability and as having the potential to erode private property rights. Existing central and local government taxation regimes (including rates and income tax) are seen by some landowners as a disincentive to both the protection of existing remnants of indigenous vegetation, and the establishment of new indigenous plantings. Unless rates relief is available, local government rates can still be paid on land even if it has been retired from production for biodiversity protection or enhancement purposes.

There is a need for the development and provision of a variety of incentives that encourage indigenous biodiversity protection and maintenance on private land, and for greater awareness and recognition of the ecosystem services benefits that biodiversity provides. Financial incentives can include grants and contributions towards site management such as fencing, weed and pest control, and the purchase of plants, or some form of monetary or equivalent "reward" for undertaking biodiversity protection and management, such as rates relief, conservation lot subdivisions, or transferable development rights. Generally, the provision of financial assistance to support action on the ground fosters goodwill and can earn biodiversity gains more than the dollar value supplied.

The delivery of services and support by Council to landowners and community groups free of charge also removes some of the potential barriers to on-the-ground initiatives and provides important recognition of actions by individual landowners and community members that have wider community benefits. These Council services might include providing technical staff or specialists to help with project management, support for consenting requirements, providing expert advice, or to help facilitate associated meetings.

Case Study

The Upper Waimakariri Weed Control project

A range of stakeholders within the upper Waimakariri River basin area have an interest in timely and effective control of new weeds, and a reduction in existing weed distribution throughout the river basin. The Waimakariri Environment Recreation Trust led the formation of the Upper Waimakariri Weeds Working Group in 2020 to discuss, coordinate and increase efficiencies of weed control within the area.

This key weed control partnership project includes landowners/managers, Selwyn District Council, Envirnment Canterbury, Land Information New Zealand (LINZ), University of Canterbury, KiwiRail, Department of Conservation (DOC), Arthurs Pass Wildlife Trust and the Waimakariri Ecological and Landscape Restoration Alliance (WELRA).

The Working Group led the development of the Upper Waimakariri River Weed Control Strategy (2022 – 2032), to provide direction to land managers for weed control within the Upper Waimakariri Operational Area. The preparation of this strategy involved consultation with stakeholders and field surveys of river systems and major tributaries within the Operational Area, to produce defined objectives and priorities for weed control.

The upper Waimakariri River has extensive indigenous biodiversity and landscape values, as well as a multitude of recreational values. The braided nature of the upper Waimakariri River provides important habitat for numerous threatened species. In the river area invasive weed species such as gorse, scotch broom and lupins threaten the naturally sparsely vegetated open gravels, with dominant infestations restricting channel movement and leaving little open gravel habitat for threatened braided river bird species while increasing the cover for their predators. Willows and other invasive trees flank the rivers' edge and invade wetlands, changing these sensitive habitats entirely. Where exotic shrubs and trees, often spread by introduced bird species, gain a foothold in the grey shrublands and grasslands, a feedback loop is formed, where further birds are attracted by the invader, and weeds are spread further thus threatening the native habitats.

Over the years weed control within the Operational Area has been patchy, with each agency and land manager conducting their own control in accordance with their obligations and objectives. This lack of coordination has seen an increase in the number of weed species present, including the spread of weed species into previously clean areas, and the degradation or loss of important ecological areas. Further weed spread and establishment has the potential to radically change the habitat values of the braided river ecosystem, as can be seen in other river systems.

Maintaining control of weeds and limiting their establishment in new areas is key for the protection of biodiversity within this river system.

The strategy aims to bring cohesion to weed control by taking a focused and organised catchment-wide approach. It aims to direct funding towards the efficient management of weeds that affect this area and the values within it and focuses largely on the coordination of surveillance and control activities, to ensure that timely control of new or emerging weed species reduces the weeds' ability to set and disperse seed, thus reducing infestation size and associated biodiversity threats over time.

From 2022 several weed control actions, as guided by the strategy, have been undertaken – including the control of grey willows within the significant Slovens stream wetland, sycamores around Moana Rua Lake Pearson, and holly in beech forest on DoC land near Cass River.

Upper Waimakariri weeds working group.

5.4. Community Empowerment and Capacity Building

Many people who live in Selwyn are dedicated to improving nature, and this brings benefits both for nature and to the people who take part. Community conservation across Selwyn has been increasing in recent years, with many volunteers playing their part in restoring and protecting nature in their neighbourhoods and local areas. Within Selwyn the Te Ara Kākāriki Trust, Kids Discovery Plantout, and Pest Free 2050, initiatives are excellent examples of community conservation in practice.

Involvement in community conservation groups helps to strengthen social bonds and community cohesiveness as well as improving our environment. Individuals, whilst developing new skills, can make a significant contribution to protecting biodiversity in Selwyn through activities such as trapping pests and predators in their own backyards, contributing to citizen science projects, and planting indigenous species. These initiatives help to build a sense of community and develop skills and capacity.

Increased funding from programmes such as Jobs for Nature has seen increasing numbers of our community employed in conservation work. Council also provides support, advice, and guidance on which (eco-sourced) native species will best grow in specific sites, as well as identifying grant funding for local environmental education and protection programmes.

Council biodiversity staff actively work with and support community groups across the district to achieve improved biodiversity outcomes. These groups are an important way for staff to get an understanding of local issues and opportunities, and to build relationships within the community.

5.5. Monitoring

The RMA and the Local Government Act, 2002 require monitoring and reporting on the state of the environment. The requirement for monitoring under the RMA enables Council to evaluate whether the objectives and policies in its District Plan are being met and can identify matters that need to be addressed in review of the District Plan, including the protection and maintenance of biodiversity.

Accurate monitoring of biodiversity following established guidelines and standards is essential to determine if progress is being made or not. A Biodiversity Monitoring Programme will be developed in accordance with the District Plan – to help determine the effectiveness of environmental protection, and consent issuance and compliance. Appropriate monitoring will also allow for timely reporting on Council's progress towards the Strategy's targets.

Mātauraka, the indigenous knowledge of Māori, provides insights on climate change that have not been captured in science. For instance, the Māori calendar maramataka has been developed over centuries of observations. Mātauraka principles will be incorporated into the Biodiversity Monitoring Programme.

Fish monitoring as part of Mātauraka Māori montioring.

Case Study

Te Ara Kākāriki

Te Ara Kākāriki Greenway Canterbury Trust is an incorporated Charitable Trust with the goal of increasing biodiversity in Canterbury. Their mission is to create a 'Greenway' – a corridor of native biodiversity Greendots between the Waimakariri and Rakaia rivers, linking the mountains to the sea, Ki uta ki tai.

Te Ara Kākāriki (TAK) was launched on November 18 2005, after discussions from a group of passionate people developed into the idea of creating green corridors of native plantings linking the mountains to the sea across Selwyn. At the time, the plight, and lack of indigenous biota of the Canterbury Plains had long caused considerable concern.

TAK aim to engage landowners, members of the community, and students, to join them in working towards achieving their goals, so that everyone understands why they are planting 'Greendots' and how they all can contribute to improving their local environment.

A 'Greendot' is a native planting of a defined size and shape, with the purpose of recreating a natural habitat stepping stone as part of an indigenous wildlife corridor. TAK work with landowners and community groups to create Greendots on public and private land, and to increase the less than 1% of indigenous vegetation remaining on the Canterbury Plains.

TAK's Plantout days, each spring, are an integral part of what they do. They arrange for volunteers, groups, and workplace colleagues to plant native seedlings at sites in Selwyn. It's a great community building initiative that helps create new connections and friendships, increases community awareness of native plants and wildlife, and provides an opportunity to make a difference to our Selwyn environment.

The Kids Discovery Plantout programme is a successful collaboration between TAK and Enviroschools and has been delivered to schools in Selwyn since 2015. It was established to allow children to interact with nature and provide them with opportunities to make a real difference to the natural spaces in their community that they feel connected to. Students learn about native biodiversity and through taking on a role of tiaki tamariki they lead action to restore habitat for biodiversity, care for their special biodiversity restoration sites, and together contribute to restoring native ecosystems across Selwyn.

In July 2021 TAK received Jobs for Nature project funding from the Department of Conservation. This project involved the employment of four restoration field workers to restore and establish Greendots. Their work included site preparation, planting, and maintenance of over 70,000 native plants as well as pest control, fencing and community engagement. The team has focused on the creation of two large 'legacy' sites as well as contributing to several smaller Greendot sites in the Tai Tapu-Ōtāhuna area.

As of November 2023, TAK has achieved:

- 191,299 Native Seedlings Planted
- 132 Greendot Planting Projects
- 23,912 Volunteer Hours
- 42.5 Hectares Planted.

Peter and Letitia from Te Ara Kākāriki.

6. Kā Whāika, Kā Aroka me Kā Mahi
Targets and Actions for the Selwyn District

Te Waihora Lake Ellesmere at the mouth of the Waikirikiri Selwyn River.

GOAL 1

Work in partnership with mana whenua, landowners and other stakeholders, to protect, enhance, maintain, and restore indigenous biodiversity whilst recognising the importance of mahika kai, taoka species, and culturally and historically significant sites.

1.1 As an expression of kaitiakitaka and rakatirataka, Council implements the Mahaanui Iwi Management Plan (IMP) to support mana whenua in their application of mātauraka Māori, tikaka and tools in biodiversity restoration planning and projects. Appropriate criteria within the IMP are incorporated in relevant work programmes to monitor implementation.

1.2 Council works in partnership with mana whenua, landowners, other stakeholders, and agencies to identify, enhance, maintain, and restore areas of significant indigenous biodiversity across Selwyn. The habitats of the most threatened mahika kai and taoka species are targeted as an initial priority with ora health and āhua condition of selected flora and fauna monitored annually.

1.3 By 2030, there is a collective-across-community level of awareness, understanding and valuing of indigenous biodiversity, mahika kai and related cultural values throughout Selwyn. This is demonstrated by widespread support for indigenous biodiversity protection enhancement, and restoration initiatives and increased integration and extension of indigenous biodiversity areas on and between rural and urban land parcels.

1.4 Alignment of Council's environmental reporting with cultural values-based environmental monitoring tools to assess and report on the cultural health of indigenous biodiversity and mahika kai in the Te Taumutu Rūnanga and Te Ngāi Tūāhuriri Rūnanga takiwā in Selwyn.

Action	Action description	Target alignment	Priority	Lead (in bold) and contributing parties	Timeframe	Potential funding source
1	Incorporate mātauraka Ngāi Te Ruahikihiki and Ngāi Tūāhuriri into programmes for restoration and enhancement of rural and urban indigenous biodiversity, mahika kai and their ongoing maintenance (including pest management).	1.4	High	**Rūnaka** ECan Council	Short term	Govt OA
2	Council, in partnership with mana whenua and key stakeholders, creates the concept of an interconnected network of protected areas, riparian margins, and indigenous biodiversity corridors - ki uta ki tai.	1.2 1.3	High	**Council** Rūnaka Agencies ESAI Catchment Groups	Short term	Govt OA
3	Council, in partnership with mana whenua and ECan, formalise an ecological and cultural monitoring regime for key waterways and water bodies in Selwyn.	1.2 1.4	Med	**ECan** Council Rūnaka Landowners	Short term and ongoing	ECan WB
4	An annual report on the cultural health of key indigenous biodiversity sites and mahika kai resources is produced.	1.1 1.2 1.4	Med	**Council** Rūnaka ECan	Short term and ongoing	Council
5	Support mana whenua to provide cultural monitoring expertise to developers and industry groups where land or infrastructure development may affect significant taoka species and mahika kai.	1.3	Med	**Rūnaka** Council ECan	Short term and ongoing	OA SWZC

Budget/funding is already identified

Budget/funding is partially identified

Budget/funding is not currently identified

Ecological assessment of a wetland being undertaken.

GOAL 2

Identify the state of indigenous biodiversity within Selwyn and develop appropriate responses in accordance with our statutory, non-statutory and mana whenua responsibilities to halt the decline of our flora and fauna.

2.1 The state and extent of indigenous biodiversity is identified to enable the development of effective planning and prioritised actions that will result in positive outcomes for our native flora and fauna.

2.2 Effective measures are in place that will fulfil Selwyn District Council's statutory responsibilities to maintain biodiversity and associated values within Selwyn and to protect indigenous habitats and ecosystems.

2.3 By utilising te ao Māori and mātauraka māori mana whenua are supported to protect freshwater resources, taoka species, mahika kai, and associated values within Selwyn.

2.4 From 2024 onwards there is no further loss of indigenous flora and fauna, native habitats, and ecosystems within Selwyn. Effective monitoring programs are in place to ascertain no further net loss.

2.5 Priority is given to effective protection of indigenous biodiversity throughout Selwyn particularly in naturally uncommon ecosystems. There is an on-going increase in the number and quality of restoration initiatives where required.

Action	Action description	Target alignment	Priority	Lead (in bold) and contributing parties	Timeframe	Potential funding source
6	Collate and summarise existing information and undertake ecological surveys where required to establish the current state of indigenous biodiversity within the district.	2.1 2.3	High	**Council,** ECan, Rūnaka LINZ DOC Landowners	Ongoing	**ECan** **Council**
7	In conjunction with relevant agencies enact a programme to facilitate the monitoring of Selwyn's indigenous biodiversity. This may include updating baseline biodiversity information, effectiveness of environmental protection, consent issuance and compliance, citizen science and State of the Environment reporting.	2.1 2.3	High	**Council,** ECan LINZ DOC Landowners Community	Short term	**ECan** **Council**
8	District Plan policies and rules are fit for purpose to protect indigenous biodiversity across the full range of ecosystems in Selwyn. Compliance with rules is met, and they are enforced as required.	2.2 2.4 2.5	High	**Council,** Agencies	Ongoing	**Council**
9	Develop and action suitable responses to unconsented development, through statutory compliance, monitoring and enforcement.	2.2 2.4 2.5	High	Council	Short term	**Council**
10	Develop and action suitable responses to key biosecurity issues including new incursions (of pest plants and animals), existing invasive weeds including wilding conifers and possible climate change pressures.	2.2 2.4 2.5	High	**Council** Agencies Landowners Community	Short term	**Council** **SNEF** **SNA Agency/ Landowner Budgets**
11	Form a Biodiversity Working group that includes mana whenua, stakeholders, and our community, that will guide the development of three yearly biodiversity work programs for the district.	2.2 2.3	High	**Council,** Rūnaka Agencies Other stakeholders	Short term	**Council (staff time)**
12	Work with other agencies and landowners on cross boundary issues that impact indigenous biodiversity.	2.2	Med	**Council** ADC WDC Agencies Landowners	Ongoing	**SNEF** **SNA RCEEF Agency/ Landowner Budgets**
13	In line with the NPS-IB expand the current Significant Natural Area (SNA) work programme to identify, assess and protect significant areas of biodiversity.	2.2 2.4	High	**Council** ECan LINZ DoC Landowners	Medium term and ongoing	**Council** **SNA** **ECan** **Govt**

Community planting.

GOAL 3

Support actions by landowners and our community to protect and restore indigenous biodiversity and enhance public awareness of our natural environment.

3.1 The Selwyn community is aware of its natural heritage, the condition and status of local indigenous biodiversity, and opportunities for improvement.

3.2 Close links are formed between Council and education providers to create learning and research opportunities that inform good biodiversity outcomes.

3.3 Council and our community take responsibility for indigenous biodiversity, and work together, including with other organisations, to identify, enhance, maintain, protect, and restore areas of indigenous biodiversity across the district.

Action	Action description	Target alignment	Priority	Lead (in bold) and contributing parties	Timeframe	Potential funding source
14	Work to educate our community on indigenous biodiversity issues and opportunities by promoting Selwyn's indigenous biodiversity - through collaboration with education providers, walks, talks, planting projects, predator free workshops, BioBlitz and other initiatives.	3.1 3.2	High	**Council** ECan TAK Education providers	Ongoing	Council SNEF
15	Establish positive working relationships with landowners, community groups, and agencies through periodic forums or workshops to progress priority biodiversity projects and help develop appropriate responses to climate change issues.	3.1 3.2 3.3	Med	**Council** ECan MPI Industry ESAI	Ongoing	Council
16	Develop a district-wide biodiversity community awareness and engagement programme which will aid the identification of key biodiversity and cultural sites and corridors to assist the development of any future documents.	3.1 3.3	High	**Council** Rūnaka Landowners ECan	Short term and ongoing	Council
17	Carry out an annual survey that will gauge awareness, interest, and participation of our community regarding biodiversity.	3.1	Med	**Council**	Short term and ongoing	Council
18	Recognise and share indigenous biodiversity protection achievements, at special events, on the biodiversity webpage and in the media (including social media).	3.1 3.3	Med	**Council**	Ongoing	Council
19	Work in conjunction with our biodiversity focused community groups to educate, protect and restore indigenous biodiversity.	3.1 3.3	High	**Council** TAK Enviroschools Summit Road Society ESAI	Ongoing	SNEF CF
20	Work with education providers to deliver environmental learning initiatives and research opportunities.	3.2 3.3	Med	**Council** Enviroschools Lincoln HS Lincoln Uni Other schools	Ongoing	SNEF CF
21	Provide advice, targeted funding, and meaningful incentives, to encourage landowners to protect indigenous biodiversity on private property.	3.3	High	**Council** ECan QEII BPCT ESAI	Ongoing	SNEF Council ECan
22	Enable and support other biodiversity funding organisations to support projects that protect and/or restore indigenous biodiversity.	3.1 3.3	Med	**Council** TAK Enviroschools SRS PFBP	Ongoing	EMF ECan RCEEF Govt
23	Strengthen existing and develop new relationships with industry, to advance support for biodiversity.	3.1 3.3	High	**Council** Fonterra Synlait Orion FAR	Medium term and ongoing	Council ECan DoC
24	In collaboration with covenanting authorities inform and encourage landholders and community groups to achieve covenanted protection for important indigenous biodiversity sites.	3.1 3.3	Med	**Council** QEII BPCT	Ongoing	SNEF QEII BPCT

Established native plantings at Lincoln Wetland.

GOAL 4

Encourage and increase the integration of indigenous species across our district, including in urban spaces, lifestyle blocks and waterways.

4.1 There is demonstrated widespread community support for, and involvement in, indigenous biodiversity restoration initiatives.

4.2 There is a high level of integration of indigenous biodiversity into our rural and urban land use systems, including Council managed reserves and public spaces.

4.3 All waterways and wetlands (including manmade) are sustainably managed for their cultural and ecological values.

Action	Action description	Target alignment	Priority	Lead (in bold) &and contributing parties	Timeframe	Potential funding source
25	Encourage and support community led projects such as mammalian predator control, restoration planting, taoka species protection and habitat enhancement.	4.1 4.2 4.3	High	**Council** Rūnaka PFBP TAK WERT ESAI	Medium term and ongoing	**SNEF** **PFBP**
26	Develop and action climate change responses to build resilience and adaption into our key areas of indigenous biodiversity.	4.2 4.3	High	**Council** ECan	Ongoing	**Council** **CMB** **SNEF**
27	Ensure that Council reserves, district parks and urban spaces have greater than 10% indigenous vegetation cover in line with the NPS-IB. Where 10% cover already exists, higher targets can be set.	4.2 4.3	Med	**Council** Community groups	Medium term and ongoing	**Council** **ECan** **CF** **SNEF** **DC**
28	Promote and enable best practice restoration actions including natural regeneration and eco-sourcing of native plants.	4.1 4.2	Med	**Council** Community groups Developers	Medium term and ongoing	**Council**
29	Develop and implement catchment management plans that identify existing values and guide the ongoing sustainable management of our waterways (including manmade). Where appropriate, this will include planting indigenous species along waterways to improve biodiversity values.	4.2 4.3	High	**ECan** Council DK	Short term and ongoing	**WB** **SNEF** **ECan**
30	Work within Council, and with our community, to enable sustainable urban design initiatives that provide long term biodiversity outcomes.	4.2 4.3	Med	**Council** TAK LU	Ongoing	**CMB** **SNEF** **TB** **DC**

ABBREVIATIONS FOR THE ACTION TABLES:

Organisations:

Council – Selwyn District Council, which includes the Environmental, Water Assets, and Reserves teams
ECan – the Canterbury Regional Council
ESAI – Ellesmere Sustainable Agriculture Incorporated
FAR – Foundation for Arable Research
LHS – Lincoln High School
TKW – Te Komiti Waiora (District Land Drainage and Waterway Committee)
LU – Lincoln University
PFBP – Pest Free Banks Peninsula
QEII – Queen Elizabeth II Trust
Rūnaka – Te Taumutu Rūnanga and Te Ngāi Tūāhuriri Rūnanga
SRS – the Summit Road Society
TAK – Te Ara Kākāriki
WERT – Waimakariri Environmental & Recreation Trust

Council Funding:

CF – Community Funding
CMB – Conservation management budget
Council – wider Council budgets
DC – Development contributions
SNA – Significant Natural Area budget
SNEF – the Selwyn Natural Environment Fund
TB – Township budgets
WB – Waterways budget

Other Funding:

ECan – includes the variety of relevant ECan funds
EMF – the Central Plans Water Environmental Management Fund
Govt – Central Government agencies
OA – Other agencies including DoC, LINZ, ECan
RCEEF – the Rakaia Catchment Environmental Enhancement Fund
SWZC – the Selwyn Waihora Zone Committee

Timeframes:

Short – 1 to 3 years
Medium – 4 to 6 years
Long – 7 to 10 years and onwards
Ongoing – business as usual work programme.

7. Aroturuki me te Arotake Monitoring and Review

The strategy takes a relatively long-term focus and it will be formally reviewed every ten years.
The targets and actions will inform the basis of a biodiversity work program. This program will be developed by the Biodiversity Working Group and it will be aligned with Council's Long-Term Plan process.

Mataī (Prumnopitys taxifolia) one of the largest trees of its kind in Selwyn foothills.

8. **Whakakapi** Conclusion

The overall purpose of the strategy is to provide strategic direction and a common focus for policy and decision making regarding the maintenance and restoration of indigenous biodiversity in Selwyn. This is to be achieved via an overarching vision resulting in protected and thriving ecosystems stretching from the mountains to the sea (ki uta ki tai) that reflect the unique and diverse natural character of Selwyn. Four main goals flow from the vision: working in partnerships to protect, enhance, maintain, and restore indigenous biodiversity; identify the state of indigenous biodiversity within Selwyn and develop appropriate responses to decline; support associated actions by landowners and our community and enhance public awareness of our natural environment; encourage and increase the integration of indigenous species in modified environments.

These goals are followed by targets and actions that identify how the vision will be achieved.

Achieving the strategy's vision will require leadership from Council, and includes working closely with mana whenua, the Selwyn community, landowners, agencies, industry, and other stakeholders.

Porters Pass

Kuputaka Glossary

Ecosourcing – is the use of plants that have been grown from locally sourced seeds. That is; seed harvested from naturally growing remnants reserves or bush within the same eco district that you plan to plant in.

Edge effects – are changes in population or community structures that occur at the boundary of two or more habitats.

MCI – Macroinvertebrate Community Index is an indicator of stream ecological health. Higher MCI scores indicate better stream conditions.

Benthic Community – the biological community that live within or associated with the bottom of any aquatic system.

Kaitiaki – cultural guardians.

Taoka – treasured things.

Mātauraka Māori – Māori knowledge, the body of knowledge originating from Māori ancestors, including the Māori world view and perspectives, Māori creativity and cultural practices.

Beech Forest, Craigieburn Forest Park.

Publisher
Selwyn District Council
2 Norman Kirk Drive
Rolleston 7643
Protecting Our Natural Heritage
Selwyn Biodiversity Strategy 2024
Published October 2024

Kā Āpitihaka Appendices

Appendix A – Taoka species in the Takiwā

Refer to the list in Schedule 97 of the Ngāi Tahu Claims Settlement Act 1998.

Appendix B – Taoka species of Te Waihora

Taoka species are culturally significant species of animals and plants that are treasured by mana whenua. Although all natural resources are considered taoka by mana whenua, specific species are identified as "taoka species" or "taoka fish species" in Schedules within the Ngāi Tahu Claims Settlement Act 1998. These include species of birds, plants, marine mammals, and fish.

Refer to Appendix 5 ("Taoka Species Present at Te Waihora") in the Te Waihora Joint Management Plan.

Appendix C: - Conservation Status of listed species

Kea *(Nestor notabilis)* - Threatened Nationally Endangered
NZ Falcon Kārearea *(Falco novaeseelandiae)* – Threatened Nationally Endangered
Rock Wren Pīwauwau *(Xenicus gilviventris)* – Threatened Nationally Endangered
Orange-Fronted Parakeet Kākāriki Karaka *(Cyanoramphus malherbi)* – Threatened Nationally Critical
Yellowhead Mohua *(Mohoua ochrocephala)* – At Risk Declining
Blue Duck Whio *(Hymenolaimus malacorhynchos)* - Threatened Nationally Vulnerable
Great Spotted Kiwi Roroa *(Apteryx haastii)* – Threatened Nationally Vulnerable
Australasian Crested Grebe Pūteketeke *(Podiceps cristatus)* – Threatened Nationally Vulnerable
Australasian Bittern Matuku-Hūrepo *(Botaurus poiciloptilus)* – Threatened Nationally Critical
Wrybill Ngutu Pare *(Anarhynchus frontalis)* – Threatened Nationally Increasing
Black Fronted Terns Tarapiroe *(Chlidonias albostriatus)* – Nationally Endangered
Black Billed Gulls Tarāpuka *(Chroicocephalus bulleri)* – At Risk Declining
Banded Dotterel Tūturiwhatu *(Charadrius bicinctus)* – At Risk Declining
Yellow Mistletoe Pirita, Piriraki *(Alepis flavida)* – At Risk Declining
Red Mistletoe Pikirangi, Pirita, Roeroe, Pirinoa *(Peraxilla tetrapetala)* – At Risk Declining
Swamp Nettle *(Urtica perconfusa)* – At Risk Declining
Canterbury Plains Tree Daisy *(Olearia adenocarpa)* – Threatened Nationally Critical
Matagouri *(Discara toumatou)* - At Risk Declining
Pīngao *(Ficinia spiralis)* – At Risk Declining
Snow Grasshopper *(Brachaspis nivalis)* – At Risk Declining
Central Arid Alpine Grasshopper *(Sigaus australis)* – Threatened Nationally Vulnerable
Longfin Eel Ōrea *(Anguilla dieffenbachii)* – At Risk Declining
Canterbury Mudfish Kōwaro *(Neochanna burrowsius)* – Threatened Nationally Critical
Canterbury Galaxias *(Galaxias vulgaris)* At Risk Declining
Alpine Galaxias *(Galaxias paucispondylus)* – At Risk Naturally Uncommon
Upland Longjaw Galaxias *(Galaxias prognathus)* – Threatened Nationally Vulnerable
Kōaro (Climbing Galaxias) *(Paranephrops zealandicus)* – Declining
Bluegill Bully *(Gobiomorphus hubbsi)* – At Risk Declining
Freshwater Crayfish Kōura (Paranephrops zealandicus) - Declining

Conservation Status is obtained from the New Zealand Threat Classification System (NZTC) https://nztcs.org.nz/home The NZTCS is administered by the Department of Conservation (DOC).

October 2024

Selwyn DISTRICT COUNCIL