Part Two: Technical

Context and current situation of Biodiversity within the Christchurch and Banks Peninsula areas.

10
Context

10.1 THE IMPORTANCE OF BIODIVERSITY

Why is biodiversity important? (Dr David Given)

Biodiversity (biological diversity) is the array of life that occurs on planet Earth.

It is the sum total of biological variety in the world. Most people are familiar with the idea of species, at least in a very loose sense. We recognise cows, dogs, various kinds of birds, oak trees and lilacs even without needing to know precisely what separates one from another. But what we recognise as the diversity of life is only the tip of a biological iceberg.

Biodiversity also includes genes that are the building blocks of life itself. At the other extreme are the assemblages of species in a particular place that form grassland, forest and wetland communities, etc; that is, the ecosystems.

It is commonly accepted that biodiversity includes genes, species and ecosystems, together with the essential processes that maintain them. It may come as a surprise to know that scientists are uncertain about how much biodiversity the world supports – estimates range from 8 million to more than 30 million species. Only a small proportion of this has even been catalogued and we know that, even in New Zealand, species are becoming extinct before they have even been named.

New Zealand is a very special place for biodiversity – we are one of 34 biodiversity hot spots of global importance, along with places such as the jungles of Southeast Asia and South America. The distinction between native (indigenous) species and introduced (exotic) species is important. Also important is recognition of endemic species (those that are confined to a particular locality or region).

In many parts of the world, including New Zealand, many species have been imported from distant parts of the world though human intervention or activity. These introduced animals, plants and fungi include house and crop plants, most pets, tropical fish, game fish such as trout and many of the birds we see in the city.

Among the introduced species are those that can spread into wild or unmanaged places and are reproducing or invading without human assistance (adventive or naturalised species, e.g. gorse, German wasp, trout, sparrow and deer). Many exotic species are like 'time-bombs' gradually building up adaptations or population numbers ready to explode and invade more of the nation's natural habitats.

Naturalised species that have commercial or environmental impacts and are a nuisance are known as weeds and pests (this latter term now covers both plants and animals). Adding up all the animal, plant and fungi species in a particular place like Christchurch gives a total picture of species richness; this is a count of all species regardless of source.

The greater the number of introduced species the greater the likelihood that native species will be displaced – locally well-adapted genetic forms, species and assemblages of species forming distinctive ecosystems will be lost and disrupted. Essential processes such as pollination and dispersal, food webs and natural energy cycles will disappear.

Each such substitution at a local level, such as in a city like Christchurch, ultimately leads to diminished global biodiversity.

10.2 BENEFITS TO SOCIETY OF HEALTHY ECOSYSTEMS

Ecosystems provide a wide range of services that benefit society. Indigenous biodiversity contributes to those services in the areas listed below.

However, for other services such as food production, introduced plants and animals are almost completely dominant. The impact of human activity on natural ecosystems can threaten the delivery of ecosystem services.
An integrated approach to Council policy is therefore essential.

Since many of the benefits from these services are not traded in economic markets, they have no price tag to alert society to any deterioration of the underlying ecological systems that generate them.

Therefore the environmental and social objectives of the strategies draw attention to their importance.

Ecosystem services in which indigenous biodiversity can play a prominent role include:

- atmospheric regulation by purifying air and regulating its composition
- climate regulation by regulating local and global temperature
- disturbance regulation by being able to adjust to environmental fluctuations (e.g. flood control and drought recovery)
- water quantity and quality regulation through the processes of the water cycle
- water supply through the storage and retention of water
- erosion control through the retention of soil within an ecosystem
- soil formation and functioning through the weathering of rock and accumulation of organic material to form soils
- nutrient cycling through the storage and cycling of nitrogen, phosphorus and other chemicals
- waste treatment through the detoxification and breaking down of wastes
- genetic resources through the sources of biological material for medicines and other uses
- recreational and eco-tourism activities such as fishing, tramping, mountain biking and many other activities
- cultural opportunities to enjoy aesthetic, artistic, educational or spiritual values of ecosystems
- provision of food and resources including mahinga kai.

10.3 NEW ZEALAND IN A GLOBAL CONTEXT

New Zealand is home to a unique palette of plants, animals and ecosystems. A very high percentage of New Zealand's plants, birds and reptiles are endemic - they are found nowhere else in the world. But because of loss of habitat, predation and competition from introduced species, our indigenous biodiversity has severely declined.

In 2007 the Organisation for Economic Cooperation and Development (OECD) provided an assessment of New Zealand's biodiversity conservation performance as part of their international Environmental Performance Review programme.

In a global context, New Zealand is recognised as having a special responsibility for biodiversity conservation, as a high percentage of its indigenous species are endemic. The OECD review highlights a range of national successes including the high proportion of New Zealand with protected status (32 per cent) which is much higher than in most OECD countries, and the increase in the area of private land protected under covenant agreements.

However, there are still a number of issues to be resolved including greater protection needed for biodiversity on private land and in ecosystems underrepresented in public conservation land.

10.4 NATIONAL BIODIVERSITY

About a third of New Zealand's land area is legally protected, but the majority of this is in remote mountainous areas.

Lowland habitats (lowland, montane and coastal forests and shrublands, grasslands, wetlands, dunelands, cliffs and rock and gravel beaches) and the species they support are less well protected. These are the types of habitats found in Christchurch and Banks Peninsula.

The 1997 report *The State of New Zealand's Environment* described biodiversity decline as our country's "most pervasive environmental issue".

The Christchurch and Banks Peninsula Biodiversity Strategy makes clear that biodiversity needs to be conserved in its natural surroundings. Coordinated local effort will make the difference between survival and extinction for New Zealand's special animals and plants.

Nationally, the kind of habitats found in and around Christchurch and Banks Peninsula are scarce, fragmented and vulnerable to ongoing decline. This is why it is extremely important that we take action now to secure the future of the city's most important natural areas and the species that depend upon them.

PHOTO: SITES SUCH AS THE MT EVANS CLIFFS PROVIDE A HAVEN FOR NATIONALLY UNCOMMON DRYLAND BIODIVERSITY.

10.4.1 Political and legislative

Under the *Local Government Act 2002,* local authorities are responsible for the environmental wellbeing of their communities. They are also responsible for maintaining indigenous biodiversity under the *Resource Management Act 1991*. This strategy sets out how Christchurch City Council intends to work with other organisations and with the people of Christchurch to meet these obligations.

The New Zealand Biodiversity Strategy, released in 2000, provides a national framework for local work to halt the decline in indigenous biodiversity. This Strategy sets out a vision for Aotearoa-New Zealand in which:

- New Zealanders value and better understand biodiversity
- we all work together to protect, sustain and restore our biodiversity, and enjoy and share in its benefits, as the foundation of a sustainable economy and society
- iwi and hapū as kaitiaki are active partners in managing biodiversity
- the full range of New Zealand's indigenous ecosystems and species thrive from the mountains to the ocean depths
- the genetic resources of our important introduced species are secure and in turn support our indigenous biodiversity.

For more information visit www.biodiversity.govt.nz

10.4.2 National biodiversity priorities

In April 2007, the Ministry for the Environment and Department of Conservation issued a statement of national priorities for biodiversity conservation, to focus efforts towards private land where the need is greatest. "Because of their responsibilities for biodiversity on private land (under Sections 30 and 31 of the *Resource Management Act 1991* (RMA), councils have the lead in putting the statement of national priorities into practice.

They can do this in a number of ways, such as in communications about biodiversity, management of their own council land, by bringing these priorities into their statutory RMA policies and plans, and using the priorities to decide where to allocate council-provided funding for community and landowner-based biodiversity programmes." (National Policy Statement, 2007)

NATIONAL PRIORITY 1:
To protect indigenous vegetation associated with land environments that have 20 per cent or less remaining in indigenous cover (as defined by the Land Environments of New Zealand (LENZ)). The 20 per cent threshold is a generalised lower limit below which species loss is likely to increase rapidly.

NATIONAL PRIORITY 2:
To protect indigenous vegetation associated with sand dunes and wetlands; ecosystem types that have become uncommon due to human activity.

NATIONAL PRIORITY 3:
To protect indigenous vegetation associated with originally rare terrestrial ecosystem types not already covered by priorities 1 and 2.

NATIONAL PRIORITY 4:
To protect habitats of acutely and chronically threatened indigenous species.

Ecosystem types	Location examples
Dune deflation hollows	Kaitōrete Spit
Stony beach ridges	Kaitōrete Spit
Shingle beaches	Kaitōrete Spit
Coastal rock stacks	Tumbledown Bay
Mafic (volcanic) coastal cliffs	Large portions of the Peninsula coastline
Marine mammal influenced sites	Seal colonies, Peninsula coastline
Cloud forest	Higher altitudes, eastern Banks Peninsula
Volcanic boulderfields	Numerous on Banks Peninsula
Mafic (volcanic) cliffs, scarps and tors	Mt Herbert/Te Ahu Pātiki area, Castle Rock
Braided riverbeds	Waimakariri River

PHOTO: KAITŌRETE SPIT SHINGLE BEACH RIDGES PROVIDE IMPORTANT HABITAT FOR MANY INDIGENOUS PLANTS AND ANIMALS.

The following map shows the classification of environments within the Christchurch City Council managed part of Canterbury. Flat lowland environments such as those on the eastern plains and the coast of Canterbury are coloured in red, indicating that overall these areas have less than 10 per cent of land under some form of indigenous vegetation as most of this area is under agriculture and has the greatest concentrations of human habitation.

The orange indicates areas with between 10-20 per cent of their indigenous cover left, mostly on the Port Hills and Banks Peninsula. Yellow shows environments in some places on Banks Peninsula that retain somewhere between 20 per cent and 30 per cent of their area under indigenous vegetation.

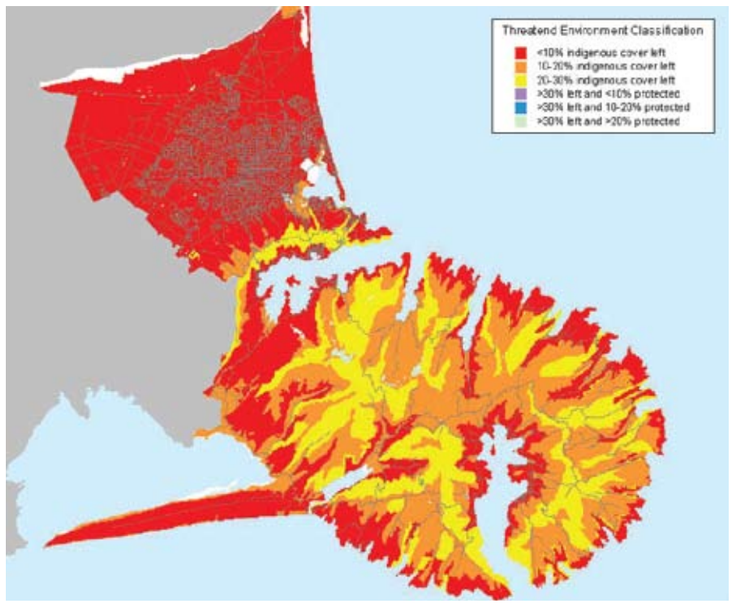
Other environments with higher proportions of indigenous cover are either very small or do not occur within Christchurch City. Wetland ecosystems are not incorporated into this classification system.

10.4.3 Areas of strategic national importance

There are places in Christchurch and Banks Peninsula where a number of important but diverse habitats and ecosystems are clustered in close proximity. In such situations recognition of the complementary nature of the adjacent ecosystems and habitats is needed. There are considerable gains to be made by planning for biodiversity in these areas (in a coordinated way).

The combined Te Waihora/Lake Ellesmere, Te Roto o Wairewa/Lake Forsyth, Prices and Kaituna Valleys area is one such place. This area contains a diversity of ecosystems ranging from lowland forest to national priority wetlands and dunelands.

The sum of the biodiversity of these areas is considerable and each plays an important role in the maintenance of the others by providing corridors, and alternative feeding areas for animals as well as influencing the environmental health of the nearby areas.



MAP: THREATENED ENVIRONMENT CLASSIFICATION.

10.5 REGIONAL CONTEXT

Biodiversity does not recognise political boundaries and to this end it is essential that local authorities work cooperatively to ensure that positive initiatives undertaken in one area are not undone in adjoining areas.

The Canterbury Regional Biodiversity Strategy, to which the City Council is a signatory, will assist councils and other organisations to work and communicate more effectively together in the Canterbury area. There are also local biodiversity issues that can be actioned collaboratively. One such example is the restoration of three duneland plants, sand spurge (*Euphorbia glauca*), spinifex (*Spinifex sericeus*) and sand gunnera (*Gunnera arenaria*) that have become locally extinct.

10.5.1 Canterbury Regional Biodiversity Strategy

Halting the decline in Canterbury's biodiversity and sustaining it into the future is the objective of the *Canterbury Regional Biodiversity Strategy*.

The Strategy's first priority is protecting and sustaining the most threatened and ecologically significant remaining habitats and ecosystems and the linkages between them. The second priority is the restoration of representative habitats and ecosystems that have been lost or degraded. The strategy promotes a coordinated and cooperative approach to biodiversity protection and enhancement across the region.

The Strategy is a non-statutory document, intended to sit alongside existing statutory and other instruments relating to biodiversity. It covers the entire Canterbury region and contributes, at a regional level, towards achieving the goals of the New Zealand Biodiversity Strategy. It takes a long-term approach and is reviewed on a five yearly basis.

A wide range of organisations including all the Canterbury councils with the exception of Hurunui have pledged their support and commitment to sustaining Canterbury's biodiversity by becoming signatories to the regional strategy.

The Christchurch and Banks Peninsula Biodiversity Strategy sits within the context of the regional strategy, but provides local context and more specific guidance for the City Council and local communities.

10.6 NGĀI TAHU AND BIODIVERSITY

(This section courtesy of Ngāi Tahu)

Ngāi Tahu Whānui, represented by Paptipu Rūnanga and Te Rūnanga o Ngāi Tahu, are comprised of Ngāi Tahu, Ngāti Māmoe and Waitaha descent, who hold manawhenua over the area that includes Christchurch and Banks Peninsula. Manawhenua refers to those whānau (families) and hapū (extended family groups) with customary linkages and rights to an area or resource through tikanga (lore and custom).

Te Rūnanga o Ngāi Tahu was established by the *Te Rūnanga Ngāi Tahu Act 1996* to give a legal identity to the tribe and to represent the tribal collective of Ngāi Tahu Whānui.

Rūnanga that hold mātauranga and are kaitiaki within Christchurch and Banks Peninsula, are Te Ngāi Tūāhuriri Rūnanga, Te Hapū o Ngāti Wheke (Rāpaki), Te Rūnanga o Koukourārata, Ōnuku Rūnanga, Te Roto o Wairewa Rūnanga and Te Taumutu Rūnanga.

Ngāi Tahu have inhabited Christchurch and Banks Peninsula for centuries before European settlers arrived. Te Pātaka o Rākaihautū is the ancient Māori name for Banks Peninsula.

It refers to Banks Peninsula as a place of abundant natural resources (i.e. store house or pātaka) of Rākaihautū who first occupied Banks Peninsula. Another ancester, Te Potiki Tautahi, after whom Ōtautahi (Christchurch) was named, was one of the original Ngāi Tahu rangatira (chiefs) to settle in the Canterbury region. At that time, the swampy flatlands of the present day site of Ōtautahi/ Christchurch City were abundant with food resources such as ducks, weka, eels and fish. Tautahi and his people made frequent forays from Koukourārata around the Peninsula and up the Avon River/ Ōtakaro to gather kai (food). They camped on the river banks as they caught tuna (eels), pātiki (flounder), īnaka (whitebait), and native trout and snared birds in the harakeke (flax). Many sites in the area remain important for their resources and/or spiritual value.

For more local history see:
www.library.christchurch.org.nz/TiKoukaWhenua/

Kaitiakitanga and Mātauranga
Whakapapa (genealogy) and the link between all living things is reflected in traditional attitudes towards the natural world. Everything has a whakapapa: birds, fish, animals, trees, soil, rocks and mountains. It is this sense of connectedness between spirit, humans and nature that forms the basis for biodiversity management for Ngāi Tahu. Ngāi Tahu were dependent on their immediate environment for survival. The traditional relationship developed over centuries of close interaction by Ngāi Tahu with local biodiversity remains an important part of Ngāi Tahu culture and identity.

Ngāi Tahu are holders of traditional and tribal knowledge about biodiversity, which is transferred between generations through pūrākau (stories), whakataukī (proverbs), waiata (song) and kōrero (discussion). It is important that mātauranga (traditional knowledge) continues to inform biodiversity management. However, mātauranga is currently underused and often undervalued and is consequently vulnerable to ongoing erosion and loss.

The kaitiaki system (often likened to guardianship) is based on whakapapa lineage. It is an inherited responsibility to ensure that the mauri (life force) of all taonga (valued or treasured resources) is healthy and strong, and that the life supporting capacity of these ecosystems is preserved. Kaitiakitanga (or the exercise of guardianship by the tangata whenua) enshrines an obligation to safeguard the well-being of the land, water, sites, and biodiversity for future generations – mō tātou, ā, mō kā uri a muri ake nei – for us and our children after us.

'Ki uta ki tai'
– from the mountains to the sea
The philosophy of ki uta ki tai means a way of understanding the natural environment, including how it functions, how people relate to it and how it can be looked after appropriately. Ki uta ki tai gives reference to the Ngāi Tahu understanding of the natural world and the belief that all things are connected – a belief shared by many other iwi and indigenous people.

It also highlights the central importance of mahinga kai, the traditional seasonal food gathering rituals of Ngāi Tahu and the role this played in the traditional understanding and management of natural resources.

Although all natural resources are considered taonga (treasures) by Ngāi Tahu, specific species are identified as 'taonga species' in the *Ngāi Tahu Claims Act 1998*.

These and other species of particular importance, such as tuna (eels), īnanga (whitebait), and kāmana (crested grebe), to Ngāi Tahu are listed in Appendix 1.

Mahinga kai encompasses the social and educational elements of food gathering. It includes the way resources are gathered, the place they are gathered from, and the actual resources themselves.

The Ngāi Tahu commitment to mahinga kai and customary use implies sustainable use and the need to manage, protect and restore species, habitats and ecosystems to enable such use to occur.

Ngāi Tahu 2025
Ngāi Tahu 2025 (2001) sets out the tribal vision for Ngāi Tahu and establishes the following desired outcomes relevant to biodiversity management in Christchurch:

- increased abundance of, access to, and use of mahinga kai
- appropriate protection of all wāhi tapu, mahinga kai and taonga tuku iho according to Ngāi Tahu values and interests
- waterways are enhanced and restored and support healthy populations of species of importance to Ngāi Tahu
- Papatipu Rūnanga are able to meet all their natural resource and environmental management responsibilities
- full participation of Te Rūnanga o Ngāi Tahu in the decision-making processes of resource management agencies.

Ngāi Tahu Mahinga Kai Enhancement Fund
In seeking to achieve some of the environmental outcomes set out in *Ngāi Tahu 2025*, Te Rūnanga o Ngāi Tahu has established a Mahinga Kai Enhancement Fund with the purpose of re-establishing a network of tribally significant mahinga kai resource areas and species. Around $300,000 per year has been allocated to this fund, which supports a number of current projects within the South Island focusing on particular species or places.

Three projects that are specific to the Christchurch and Banks Peninsula area are Kaupapa Kererū, Te Roto o Te Roto o Wairewa Mahinga Kai Park and the Te Waihora Mahinga Kai project.

PHOTO: COASTAL HEADLANDS AND MOST OF THE BAYS ON BANKS PENINSULA HAVE VERY LITTLE REMAINING INDIGENOUS FOREST COVER. AT OKAINS BAY THE DOMAIN COMMITTEE ARE UNDERTAKING RESTORATION PLANTING ON NGĀI TAHU-OWNED COASTAL LAND.