

## A biodiversity strategy for Christchurch<sup>1</sup>

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### ABSTRACT

Despite a century and a half of urban development, Christchurch contains a wide variety of plant and animal life. This is partly a reflection of its location, encompassing the Port Hills, coast, waterways and wetlands, and dry woodlands and grasslands.

To meet the challenge to protect, restore and celebrate the city's biodiversity, the City Council has set out on the process of determining the priorities for Christchurch. This includes looking at how to implement the New Zealand Biodiversity Strategy at a local level through community education and involvement, developing a sense of place, and identifying gaps in our knowledge and management skills and finding ways to address them. Workshops have been held with local communities and with key stakeholders and from these a series of goals and objectives have been developed. The draft strategy includes a list of actions for implementing these. It also provides a brief overview of the components that make up the city's biodiversity, including estimates of between 2500 and 4500 endemic insect species and more than 350 native plant species. The strategy provides a graphical outline of the main initiatives proposed for each of the four main ecosystems within the city boundaries, i.e., revegetation of Port Hill gullies, revegetation projects along the coast, waterway restoration on the wet plains, sustainable management of the dry woodlands and grasslands.

The strategy aims to provide an overview of the work that is needed and practical ways in which the whole community can work together to sustain the full range of species and habitats that are special to Christchurch.

### INTRODUCTION

National biodiversity policy has been significantly strengthened in the last few years. In February 2000 the Department of Conservation and the Ministry for the Environment combined to produce a biodiversity strategy for New Zealand (DOC & MfE 2000). The goals of this document include halting the decline in New Zealand's indigenous biodiversity, and encouraging community and individual involvement in achieving this. The national strategy recognises local government as one of the agencies that will play a key role in achieving the desired outcomes.

Recent legislative changes (Local Government Act 2002; Resource Management Amendment Act 2003) have reinforced this role for local government, including expanding the functions of territorial authorities under the Resource Management Act to specifically include:

*'the control of any actual or potential effects of the use, development, or protection of land, including for the purpose of...  
... (iii) the maintenance of indigenous biological diversity.'* (Sec. 31).

<sup>1</sup> Editor's note: since the time of writing, a draft of the biodiversity strategy was released to the public for comment from 14 July to 8 September 2004 (CCC 2004). The Biodiversity Strategy Team are currently preparing the final draft of the biodiversity strategy. Further information is available at <http://www.ccc.govt.nz/parks/TheEnvironment/biodiversity.asp>.

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This is further supported by the purpose statement in the recently updated Local Government Act (2002), which states that one of the purposes of local government is:

*'To promote the social, economic, environmental, and cultural well-being of communities, in the present and for the future.'* (Sec. 10 — emphasis added).

These and other national policies in the foreseeable future are likely to increase the mandate for proactive approaches taken at the regional level in preparing biodiversity strategies for the cities of New Zealand. The Christchurch City Council is well on the way to achieving this aim.

### **CHRISTCHURCH BIODIVERSITY VALUES AND TRENDS**

Despite a century and a half of urban development, Christchurch contains a wide variety of plant and animal life, estimated to include 2500–4500 endemic insect species and more than 350 native plant species. This is partly a reflection of the city's location, encompassing the wide range of habitats and environmental gradients of the Port Hills, coast, waterways and wetlands, and dry woodlands and grasslands (Fig. 1).

#### **Port Hills**

Large areas of the Port Hills are now being managed for their natural values. The tussock covered slopes, rocky outcrops and bush clad valleys of the Port Hills provide refuge for many plants, particularly in areas where the terrain makes grazing difficult. A number of birds also depend on the native bush remnants; among these are an increasing number of bellbirds (or korimako; *Anthornis melanura*), which move down to the wooded areas and gardens of Christchurch for food during the leaner months of winter.

Key aims of the strategy include continuing work on revegetating gullies and restoring areas of native bush, conserving tussock grasslands, and controlling plant and animal

pests. The potential for reintroducing some of the bush birds that have disappeared over the last century, such as tomtits (*Petroica macrocephala*) and brown creeper (*Mohoua novaeseelandiae*), is also examined.

#### **Coast**

The City's coast includes dune systems, estuaries and rocky shoreline. These shores provide habitat for hundreds of species of single-celled organisms, plants and animals. Worms, snails, crabs, shellfish and microscopic creatures provide a feast for young fish and wading birds (CCC 2000). Over summer, the Avon-Heathcote Estuary and surrounding areas provide habitat for a multitude of birds, including a major wading bird population. This includes thousands of eastern bar-tailed godwits (kūaka; *Limosa lapponica*) that congregate at the end of summer, prior to embarking on their 10 000 km annual migration to the Arctic.

White-flipped penguin (*Eudyptula minor albosignata*), a local subspecies of little blue penguin, are restricted to the Banks Peninsula, Motunau Island and the North Canterbury coast. The endangered Hector's dolphin (*Cephalorhynchus hectori*) also has a restricted distribution, and the South Island subspecies is a common sight around Banks Peninsula. Coastal dunes are home to the endemic katipō spider (*Latrodectus katipo*), and populations at South Brighton Beach and elsewhere have declined dramatically over the last decade or so<sup>3</sup>.

Issues affecting the coastline include improving water quality entering coastal waters from river systems, restoring the ecology of the dune systems and protecting saltmarsh habitat. A number of initiatives for enhancing coastal ecology, such as dune revegetation projects, are already well established, while others are at an early stage.

#### **Wet plains (waterways and wetlands)**

Settlement of Christchurch has resulted in much draining and filling of former wetland areas. Despite this, Christchurch still has more than

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<sup>3</sup> Editor's note: the decline of the katipō spider is discussed in more detail in these proceedings in the paper by Philip Grove.

360 km of open waterways and more than 50 wetlands (CCC 2003), although many of the latter are small.

The most significant freshwater example is Travis Wetland, the largest remaining lowland wetland in Canterbury and home to an estimated 650–800 different insect species as well as a thriving bird population of almost 60 species, including the rare Australian bittern and about half of the City's pūkeko population (CCC 2000). Travis Wetland also contains a number of plant species now rare on the Canterbury Plains including the only substantial stand of mānuka (*Leptospermum scoparium*). Other plants such as sedges (*Carex flaviformis*), rushes (*Baumea rubiginosa*), spider orchids (*Nematoceras macrantha*; syn. *Corybas macranthus*) and native sundews (*Drosera binata*) are regionally vulnerable.

In recent years, changes to the management of waterways have moved away from a focus on drainage towards a more integrated approach, reflecting a wider range of values. One of the results is that, for many waterways, streamside plantings more closely resemble the vegetation of pre-European Christchurch. Native fish life however remains impoverished.

Protection and enhancement of remnant wetlands and existing waterways, and a catchment management approach to planning, are the most efficient and effective way of maintaining the values these areas provide. The strategy examines opportunities for creating a matrix of habitat sanctuaries throughout the city and surrounding rural areas. Development in the Styx catchment has provided the opportunity to create a wildlife sanctuary, protected by a predator proof fence, at Styx Mill Reserve. The vision for this reserve is to enhance wildlife values and to provide a range of learning and recreational opportunities by working with community groups and other agencies.

Another aspect of the strategy will be to promote best practice for subdivisions, and land development, especially with respect to land drainage and water quality issues.

### Dry plains

Despite at first appearing quite desolate and barren, the dry plains ecosystems to the west of Christchurch contain a surprising wealth and variety of indigenous species. The local flora includes native shrubs, grasses, herbs, mosses, lichens and orchids. Many of the herbs and smaller shrubs grow to only a few centimetres in height and the effect of current grazing regimes on their long-term survival is unclear. These lower-growing plants include dwarf heath (*Leucopogon fraseri*), leafless pohuehue (*Muehlenbeckia ephedroides*), mat daisy (*Raoulia monroi*), onion orchids (*Microtis unifolia*) and prostrate broom (*Carmichaelia corrugata*). Larger shrubs including porcupine shrub (*Melicactus alpinus*) and prostrate kowhai (*Sophora prostrata*) are also present.

Amongst the larger shrubs is a rare and only recently discovered species of New Zealand's native tree daisy (*Olearia adenocarpa*; Fig. 2; see Heenan & Molloy 2004). While many of the larger shrubs, including the rare tree daisy, scattered kōwhai trees (*Sophora microphylla*) and matagouri (*Discaria toumatou*), have been severely chewed by sheep, rabbits and hares, it is recognised that some grazing is necessary, both to reduce competition from exotic grasses and to lessen fire risk. In addition to the flora, there is an associated rich invertebrate fauna.

Research is needed on how to best protect the remnants of the dry plains grasslands by developing sustainable management systems and determining appropriate levels of grazing. Control of pest and weed species, including nassella tussock (*Nassella trichotoma*), gorse (*Ulex europaeus*) and broom (*Cytisus scoparius*), will also be important.

### Urban Christchurch

Trees and shrubs (both indigenous and exotic) in private gardens and public spaces across the City function as a sparse woodland providing habitat and food for Christchurch's bird and insect life. A wide variety of native trees, shrubs and grasses are found in home gardens, while small pockets of moss and ferns exist amongst the cracks in the pavements and walls of buildings of the city's urban centre.

The City Council's annual residents' survey<sup>4</sup> of 2003 found that 72% of the residents surveyed would like to see more native birds in their neighbourhood, while 58% would like to see more native plants.

The strategy includes methods for incorporating biodiversity into the fabric of urban Christchurch. Community involvement, education<sup>5</sup>, plantings, and pest and weed control are all important factors.

### STRATEGY PROCESS AND CONTENT

Development of the strategy has included a series of both public and technical workshops, as well as gathering information from specialists and practitioners, often on a voluntary basis.

A vision has been developed based on feedback from the workshops:

*'A Garden City internationally renowned for the conservation, restoration and display of its unique natural biodiversity.'*

*Local Communities working together to sustain the full range of species and habitats which are special to the Port Hills, coast, plains, waterways and wetlands of Christchurch.'*

Goals, objectives and actions are also being developed from the consultation process. A summary of the goals and objectives is shown in Table 1. From this, draft 'Action Plans' have been drawn up, which list a number of actions beneath each objective, how they might be achieved and who will have primary responsibility for them. Targets for achieving each action are identified, along with a monitoring step to check effectiveness (Table 2).

Area-based concept plans are being drawn up, which will highlight the main priorities for enhancing biodiversity within the different ecosystems found on the Port Hills, coast, wet

plains, and dry plains. This will be summarised for the whole city on a separate map.

The scale of the work envisaged is considerable and from the beginning of the strategy's development it has been realised that it is critical that this is not just an exercise in paperwork and consultation. In order to achieve the strategy's goals, the team involved in its development have prepared a case for a Biodiversity Coordinator, to ensure that the strategy is implemented in an efficient manner.

Throughout the whole process a team of staff and councillors have worked together. This has helped keep energy levels up and ensured good progress. The result will definitely be a team effort, with lots of assistance from the public and our specialist advisors.

### SUMMARY

The preparation of a Biodiversity Strategy for Christchurch is a proactive response to recent policy initiatives at a national level. The vision for the Strategy is to protect, restore and celebrate the city's biodiversity by working with the communities of Christchurch. Goals and objectives have been developed through a consultation process and specific actions are planned to achieve these. Implementation of the strategy has been a key focus throughout its development, which has involved an enthusiastic team, assisted by a number of specialist advisors who have been very generous with their time.

### ACKNOWLEDGEMENTS

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The Biodiversity Team and assistants: Cr Carole Anderton, Cr Chrissie Williams, Cr Carole

<sup>4</sup> Results of the survey are on the Council's website: <http://archived.ccc.govt.nz/residentssurvey/2003/>.

<sup>5</sup> 54% of residents surveyed agreed, or strongly agreed, that they would like to learn more about plants and wildlife that are native to New Zealand.

Evans, Kelvin McMillan, Kelly Hansen, Rachel Barker, David Newey, Jenny Ridgen, Kate McCombs, Colin Meurk, David Given, Ray Tye, Michele Hider, Kerry Everingham, Liz Briggs, Kay Holder, Susan Meaclem, Eric Banks and Bob Hopkins.

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**Table 1** Summary of the Goals and Objectives for the Biodiversity Strategy. (From CCC 2004, p. 52).

<b>GOAL ONE: Conservation of Christchurch's existing biodiversity</b>	
Objectives:	1.1: Collate existing biodiversity information and make it widely accessible 1.2: Conservation of sites with biodiversity value 1.3: Control plant and animal pests in identified areas 1.4: Cooperate with private landowners and other agencies 1.5: Promote enhanced biodiversity in all City Council practices.
<b>GOAL TWO: Restoration of Christchurch's ecosystems</b>	
Objectives:	2.1: Establish, restore and connect representative indigenous ecosystems 2.2: Maintain, and restore threatened species and ecosystems 2.3: Restore species and habitats that are important to Ngāi Tahu 2.4: Plant a functionally diverse mixture of species to enhance biodiversity 2.5: Enhance resilience of sites to disturbance 2.6: Support ecologically sustainable cultural use by Ngāi Tahu and the community.
<b>GOAL THREE: Raised awareness and understanding of Christchurch's biodiversity</b>	
Objectives:	3.1: Include indigenous biodiversity in the general promotion of Christchurch 3.2: Inform and educate people about Christchurch's biodiversity and the role of indigenous species 3.3: Inform people of Ngāi Tahu values and roles in biodiversity management.
<b>GOAL FOUR: Participation by people in supporting biodiversity</b>	
Objectives:	4.1: Provide opportunities for people to support biodiversity 4.2: Provide incentives to the public to participate in supporting biodiversity 4.3: Build and strengthen partnerships with Ngāi Tahu (specifically Ngāi Tuahuriri Rūnanga, Te Hapu o Ngāti Wheke and Te Taumutu Rūnanga) in managing biodiversity 4.4: Promote coordination and cooperation between Council, landowners and other organisations.
<b>GOAL FIVE: Ongoing research and monitoring</b>	
Objectives:	5.1: Monitor identified biodiversity sites and species 5.2: Cooperate with research organisations 5.3: Involve the community in biodiversity research and monitoring.

**Table 2** Example of a draft 'Action Plan'. (See CCC 2004, p. 53–65 for action plans of all five goals).

<b>GOAL ONE: Conservation of Christchurch's existing biodiversity</b>				
Objective 1.1: Collate existing biodiversity information and make it widely accessible				
<b>No.</b>	<b>Action</b>	<b>Responsibility (Leader in bold)</b>	<b>How might it be done</b>	<b>Initial target(s)</b>
1.1.1	Collate and summarise existing biodiversity-related information, including sites and species significant to Ngāi Tahu  (The level of availability will need to take into account the sensitive nature of some site and species information)	<b>Biodiversity Team</b>  Ngāi Tahu  Research organisations  Information Technology Services  Asset Management Team	<ul style="list-style-type: none"> <li>• Collate existing biodiversity information from experts and research organisations, e.g., sites, species lists, maps, photos, reports, references</li> <li>• Compile a schedule of sites and species important to Ngāi Tahu</li> <li>• Write a description of each site and note significant features</li> <li>• Establish systems to keep information up to date, e.g., dynamic reports in a database, automated updates of map layers</li> </ul>	<ul style="list-style-type: none"> <li>• Information collated by December 2005</li> <li>• Information regularly updated</li> <li>• Information on 10 sites summarised each year</li> <li>• System devised to simplify updating data and producing summaries by June 2007</li> </ul>
1.1.2	Make biodiversity information available to all Council staff, Ngāi Tahu and to the public	<b>Biodiversity Team</b>  Planning and Investigation Team  Ngāi Tahu  Information Technology Services  Communication Team	<ul style="list-style-type: none"> <li>• Make information available online</li> <li>• Include biodiversity information on Land and Project Information Memoranda (LIMs and PIMs)</li> <li>• Include information on Area and Neighbourhood Plans mapping database</li> <li>• Publish reports on aspects of biodiversity, e.g., area of wetland left, number of sites with threatened species</li> </ul>	<ul style="list-style-type: none"> <li>• Biodiversity information is available online and updated regularly</li> <li>• A plan to include biodiversity information on LIMs and PIMs written by December 2005</li> <li>• Four reports published annually</li> </ul>

Map of Major Proposals

Major conservation & enhancement opportunities

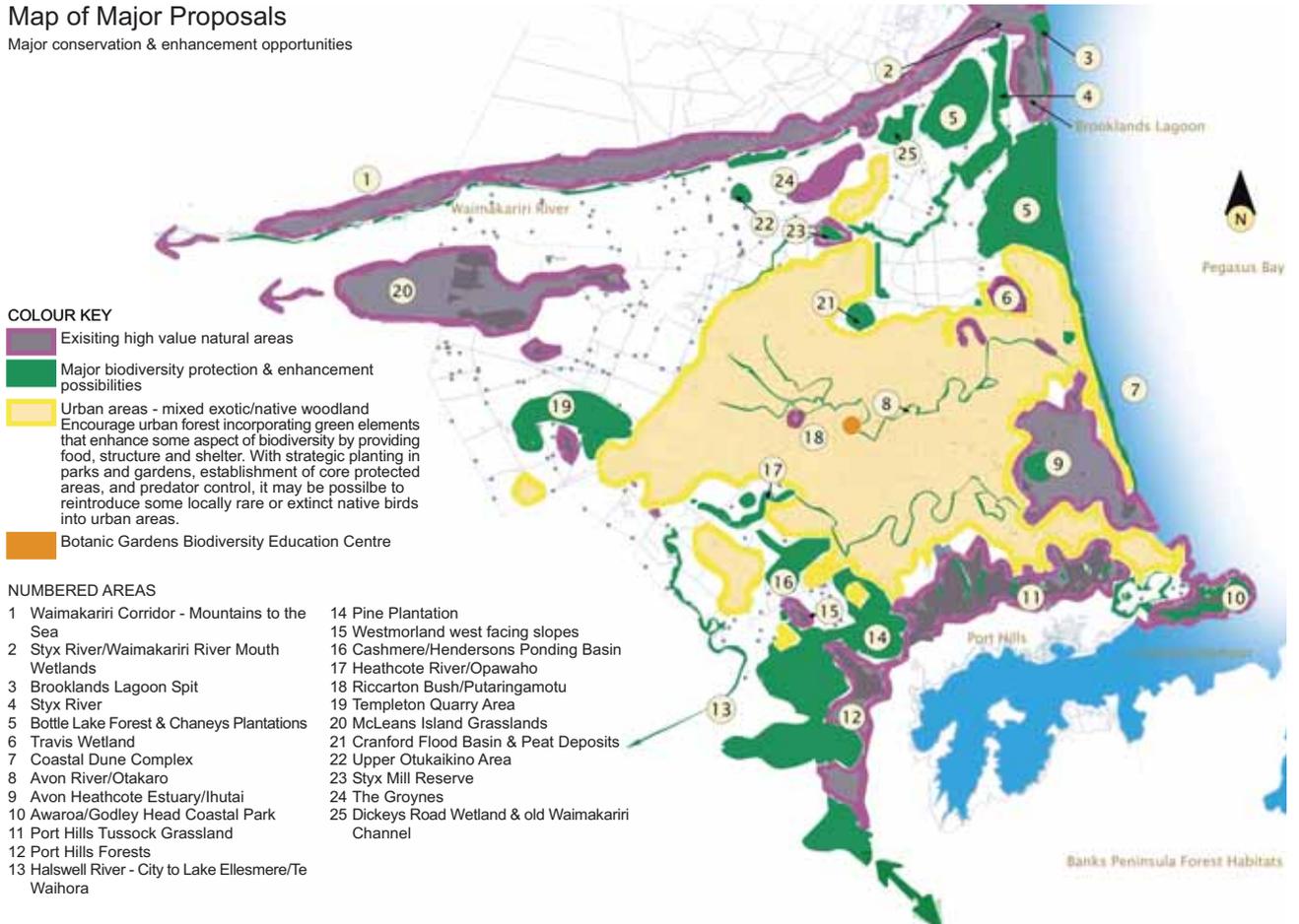


Fig. 1 Biodiversity in the Christchurch area: conservation and enhancement opportunities.



Fig. 2 *Olearia adenocarpa*. (From CCC 2004, p. 65; photo: M. Walters).