

Open Space and Natural Ecosystems

Key Information	Why is this Useful?	What is Happening?
Area of public open space per 1,000 residents.	This measures whether the ratio of public open space (neighbourhood, district and metropolitan parks) to population is at a level which meets the recreational and amenity needs of the community.	- In 1996 and 1999 there were 4.5 hectares of zoned public open space per 1,000 residents in Christchurch.
Area of conservation land in Christchurch.	This measures the amount of land in the City protected for its significant scenic, ecological and heritage values.	↑ This increased by 218 hectares between 1995 and 1999 to 4,892 hectares.
Number and area of Ecological Heritage Sites.	Ecological Heritage Sites are those areas in the City which have high levels of indigenous natural value. The number and area of these sites provides a measure of whether new sites are being identified or being degraded.	● The City has 49 Ecological Heritage Sites with an area of 3,117 hectares.
Number of protected trees in the City.	This measures the number of trees which have sufficient heritage and/or amenity value within Christchurch and warrant some level of protection.	● There were 19 heritage and 2,567 notable trees listed in May 1999.

Other Related Sections: Population Growth, Land Use, Surface Water, Coastal Environment, Built Environment, Urban Amenity, Heritage, Transportation.

Christchurch City has the following outstanding natural features and landscapes:

- The Port Hills
- Coast
- The Avon-Heathcote Estuary
- Rivers
- Brooklands Lagoons

In addition to these large-scale features many areas of the City are valued for public recreation, open space, conservation values and having significant indigenous vegetation. A balance needs to be found between pressure from development, population growth and lifestyle changes, and the need to provide adequate levels of open space for recreation, without adversely impacting on important landscapes and indigenous habitats.

Public Open Space

In a growing city such as Christchurch the role of public recreational open space is of vital importance. These areas make the City a more attractive place to live and visit. They contribute to Christchurch's 'Garden City image' and are important areas for all types of recreation.

In May 1999 the Christchurch City had 2,872 hectares of zoned open space (Table 2.16). The area zoned as open space increased by 44 hectares between the notification of the City Plan in 1995 and when Council decisions were released in 1999. Areas zoned as open space are the parks and reserves in the City that are primarily for public use or organised recreation. Conservation zones occur in areas where natural and heritage values are predominant.

Open space is divided into the following categories:

- Neighbourhood parks, which comprise small areas of open space. Generally between 0.1 and two hectares in size, they are of value to local neighbourhoods and communities.
- District parks which are primarily large areas of public open space serving a suburban or district-wide function. These are generally greater than two hectares in size.

	Area (hectares)	
	1995	1999
Open Space		
Neighbourhood Parks	124	137
District Parks	1,053	1,068
Metropolitan Parks	249	254
McLeans Island	802	802
Private Recreation Facilities	316	317
Agribusiness Centre	103	106
Clearwater resort and Rosebank	181	188
Total Open Space	2,828	2,872
Conservation		
Natural, Ecological and Scenic Parks	1,545	1,608
Coastal Margins	471	514
Bromley	473	467
Historic and Garden City Parks	87	133
Waterway Conservation	54	48
Waterway Conservation - Waimakariri	2,044	2,044
Cemeteries	72	77
Total Conservation	4,674	4,892

Source: Christchurch City Council.

- Metropolitan Parks comprise large publicly-owned stadiums and other public recreation areas which include large built structures or single use developments.
- Other areas in the City which are zoned for open space and recreational activities include McLeans Island, private recreational facilities such as golf courses and the Clearwater Resort, and the agribusiness centre incorporating the new A & P showgrounds and saleyards.

It is intended that the amount of public open space in Christchurch should remain consistent with the population of the City. This means that as the population increases, more open space needs to be zoned. At June 1999 the area of neighbourhood, district and metropolitan parks per 1,000 residents was 4.5 hectares. This level has remained around the same since 1996. The proportion of City parks which meet local needs (ie neighbourhood and district parks) to residents is around 3.7 hectares per 1,000 people.

The proportion of open space at local or neighbourhood level within the urban area is quite variable, with areas in the outer suburbs having higher levels of open space than areas in the older central parts of the City.

In addition to the areas zoned in the City Plan as open space, other areas such as the Bottle Lake Forest Park provide a recreation function as well as being a production forest. Small amounts of land are constantly being rezoned as a result of subdivisions, through Council purchases or being gifted to the Council. They are not included in these totals.

Conservation Zones

Table 2.16 shows the breakdown of conservation zones in the City. There were 4,892 hectares of land zoned conservation in the City at June 1999. The majority was in natural, ecological and heritage parks, or the bed and surface of the Waimakariri River. Conservation zones are more sensitive to modification or intensive public use than open space zones. However, areas of these conservation zones are used for public use and recreation purposes, with some land areas, such as the Botanic Gardens, being subject to intense public use.

Natural Areas and Ecological Heritage Sites

Five hundred and one sites within the City were identified by the Lincoln Centre for Resource Management in 1993 as having some natural value. These included wetlands, woodlands, saline habitats, forests, grassland and shrublands found within the Port Hills, low plains and the coastal environment (Table 2.17). The top 49 sites were selected as

Table 2.17 Types of Natural Area Sites

Vegetation Type	Number
Exotic conifer forest (with indigenous elements in the understorey)	44
Grass - shrubland	114
Hedgerows, shelter belts and other fence line communities	16
Maritime or coastal dunes and saline wetlands	33
Open woodland-scrub or planted gardens and continuous shrubland	150
Predominantly indigenous (podocarp)/ hardwood forest	16
Swamp and riparian sedge rush wetland (including water races)	82
Willow forest (with regenerating elements beneath)	46
Total	501

Source: Christchurch City Council.

Ecological Heritage Sites, because of their high values based on the following five criteria:

- Biodiversity (number of indigenous species);
- Representativeness (of the original soil - vegetation system);
- Unusualness (the number of rare or uncommon species);
- Naturalness (the percentage cover of indigenous species, with a reduced value where there are problem weeds on the site);
- Area.

Ecological Heritage Sites comprise an area approximately 3,120 hectares in size (excluding the Avon-Heathcote Estuary, which is controlled by the Canterbury Regional Council), and are classified into the groups shown in Table 2.18. A proportion of the sites are in public ownership.

Many of the Ecological Heritage Sites are in conservation zones or public ownership, including the Christchurch City Council, the Canterbury Regional Council and the Department of Conservation. Others are in private ownership and are protected by rules in the Proposed City Plan, with a few sites having special rules.

Although there are many natural areas and Ecological Heritage Sites within the City, their highly fragmented nature and often small size means they are vulnerable to threats including development, cultivation, forestry, fire and weeds. If the small sites can be linked to other sites by "green corridors or linkages", this would allow the natural spread of plants and animals between the sites.

Category	Number of Sites	Area of Sites (ha)
Coastal dunes	1	353
Native shrubland	7	184
Grassland / shrubland	32	2,021
Wetlands and riparian areas	9	559
Total	49	3117

Source: Christchurch City Council.

The location of Ecological Heritage Sites includes the following:

- Rocky outcrops, patches of native forest and silver tussock grassland on the Port Hills eg areas such as Dry Bush in Bowenvale Valley, Mount Vernon Park, Castle Rock reserve and Godley Head reserve.
- Remaining wetlands such as Travis Wetland, Styx Mill reserve, Coutts Island reserve, and Horseshoe Lake. Historically, Christchurch vegetation was dominated by wetland vegetation.
- Riccarton Bush, which is a rare remnant of floodplain forest in the City.
- A nationally significant area of dry grassland on the plains in the north-west part of the City. This area includes a rare type of native grassland with scattered shrubs and kowhai trees.
- The coastline from the Waimakariri River to South Shore Spit supports a diverse range of native plants and animals.
- The rocky coastline around Godley Head.

Protected Trees

Tree cover and vegetation make an important contribution to amenity values in the City. Existing vegetation is often lost and not replaced when sites are redeveloped. The City Plan has identified and listed 19 trees of heritage status and 2,567 notable trees. The notable trees listed include 19 groups comprising an unspecified number of trees.

Protected trees are considered worthy of recognition based on a number of criteria which may include:

- Historic significance to the community
- Scientific or botanical significance
- Cultural or spiritual significance
- Recreational significance
- Landscape significance
- Functional value
- Size or age.

A tree may be protected because of a combination of factors, or because it is outstanding in one respect. Heritage trees have at least one or more factors which give them metropolitan or wider significance and which makes them outstanding or unique. Notable trees are identified as important in neighbourhood landscapes. They may be large, old, have a high visual profile or other character, which individually or in combination, make them worthy of listing.

Street trees

In addition to heritage and notable trees, many other trees and types of vegetation enhance the amenity of the City. Street trees are a source of vegetation within public spaces. Currently there are well over 42,000 street trees on more than 1,400 of the approximately 3,300 roads in Christchurch.

The first large-scale street tree planting took place in the Four Avenues of Christchurch in the late 1860s. Now, an average of 30 additional streets are planted by the Council each year, mostly at the request of residents. Neighborhood improvement schemes and road reconstruction works have also created new opportunities for planting in areas previously without street trees.

Indigenous Urban Vegetation³¹

The urban environment is often overlooked as a source of indigenous vegetation. Historically in New Zealand much of the focus on indigenous vegetation is often directed at those areas of pristine natural vegetation. The only alternative to this has frequently been purely utilitarian, maximising production or beautifying gardens and using monocultures or formal exotic systems. However, in the context of reversing the decline in New Zealand's biodiversity, the urban environment may be a significant resource, especially where there are receptive sites, economic resources and fewer exotic browsing and predatory animals. In some cases urban areas may even provide a more hospitable habitat for sensitive indigenous species than non-urban areas.

Until recently little was known about which indigenous plants have naturalised³² in the urban environment. The Christchurch City Council, in partnership with Lincoln University and Landcare Research, has been involved in a project to list native species in natural and semi-natural areas of Christchurch City. Part of this project identified which indigenous and exotic plant species were found at various natural and semi-natural areas in the city such as wasteland, lawns, herb borders, shrubbery, parkland and hard surface cracks.

³¹ Based on work carried out by Maria Ignatava, Lincoln University, Colin Meurk, Landcare Research, and Kate McCombs, Christchurch City Council.

³² Naturalised plants are those plants that live and reproduce in the urban environment without human intervention, so this excludes gardens.

Table 2.19 Species diversity of naturalised urban plant communities in Christchurch

Biotope	Number of sites recorded	Species		
		Exotic	Indigenous	Total
Wasteland	3	69	7	76
Shrubbery	3	45	6	51
Hard surfaces	10	43	6	49
Lawn	7	36	8	44
Herb Border	2	26	0	26
Parkland (woodland)	1	12	1	13

Source: Landcare Research and Christchurch City Council.

Table 2.19 shows the number of individual plant species in the various natural and semi-natural areas of the urban environment. Of the total number of species identified in the Christchurch study, 159 were naturalised exotics and 18 were indigenous. Wasteland areas had the greatest species diversity, while the parkland area had the lowest number of species. It is interesting to note that hard surfaces such as walls, cracks and graves have a level of species diversity comparable to shrubbery and lawn. Nearly 400 indigenous species grow wild in Christchurch City, indicating that an untapped potential exists for greater incorporation into cultural landscapes.

The study also compared the composition of the naturalised Christchurch urban plant communities with similar urban plant communities in Europe. It was found that the Christchurch urban plant communities were poor in indigenous species compared with a similar European study in St Petersburg, Russia.

Many of the naturalised plant species found in Christchurch are actually the same as in other cities of the world. For example, over 90 per cent of the naturalised species of European or other origin found in Christchurch are also found in similar European cities.

Birdlife in the Port Hills³³

During 1996 Port Hills birdlife was examined to identify changes in species composition from the 1850s to the present day. An overview of habitat requirements was also undertaken and recommendations made to enhance native forest in order to increase birdlife.

Thirteen native bird species and 18 introduced bird species were known to occur in the Port Hills in 1966 compared with 31 species of native birds known to have lived there during the 1850s.

The cause of this decline is attributed to the

destruction of forest cover through bush fires, land clearance and timber milling, combined with the impact of predators and introduced bird diseases.

Of the native species, the following eight are generally found in bush habitats: New Zealand pigeon (kereru), shining cuckoo, brown creeper, grey warbler, fantail, tomtit, silver eye and bell bird. Although there are larger numbers of introduced birds in the Port Hills, competition between the introduced and native birds is probably minimal. In general the introduced species occupy

empty niches, including those left abandoned after the extinction of earlier native species. Some introduced species (particularly blackbirds) play an important role in native seed dispersal and subsequent forest regeneration.

Forest Size

Forest on the Port Hills is characterised by small, fragmented bush remnants. Much of this native forest is presently highly degraded by browsing animals such as cattle, sheep, goats, pigs, possums and deer. Even reserves such as Kennedy's Bush and QEII Trust-covenanted areas like Prendergast's and Ahuriri Valley have not escaped. Outwardly these areas have the appearance of healthy stands of bush; inwardly some of them could be described as 'skeleton forests' so complete is the destruction of understorey vegetation.

This means opportunities for many native bird species on the Port Hills are limited due to lack of space and an insufficient food resource. All of those species presently established in good numbers (bell bird, grey warbler, fantail and silvereye) are birds that can utilise a variety of habitats and are capable of crossing open country between pockets of bush. In autumn and winter, a proportion of these birds leave and take advantage of food sources in farmland and City gardens during a time of scarcity within the bush remnants. Other native bird species with more restricted habitat requirements (eg tomtit and brown creeper) do not leave the Port Hills, so the size of their populations is governed by the number that can survive there through winter.

³³ Information in this section is based on the report for the Parks Unit, Christchurch City Council, by Andrew Crossland: Port Hills Birdlife: Inventory, Analysis and Restoration Potential, August 1996.